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The word 'Human Services' is used when someone faces social challenges for 'help' or 'support' people.

'Human Services' is expanding rapidly its area such as field of social welfare, medical, nursing, clinical psychology related mental care, health promotion for aging society, assist family for infant and child care, special supporting education corresponding to vocational education, education support sector corresponding to era of lifelong learning and fluidization of employment corresponding to the area of career development.

Human Services area, if its research methods are scientific, is internationally accepted and greater development is expected by collaborative research which is performed by multinational and multi-profession.

This journal aims to contribute to the progress and development of Asian Human Services.

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ORIGINAL ARTICLE

Development of Sustainable Work-styles for Individuals and Team Challenges (SWITCH) as a Tool for Measuring and Promoting Work Motivation; Theoretical Definition, Reliability, and Validity

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ABSTRACT

By working, people maintain their motivation to work and gain a sense of daily fulfillment and self-understanding. the aim of this study is to clarify how employees' interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles. The data from 1,693 subjects out of 1,946 were analyzed. Cronbach's coefficient was used for reliability verification. Content validity and construct validity were also used to verify the validity of the scale. Among the participants, 97.7% were women. As a result of the analysis, the reliability coefficient for the entire scale was 0.967. The structural equation models showed that the fit of the model is good with RMSEA of 0.067, GFI of 0.926, and CFI of 0.927. Regarding the indicator variables in the path diagram, the indicator for "Relationships with co-worker" had a moderate correlation with "Work environment". there was a weak causal relationship between "Personality", "Concept formation", "Interest", and "Motivation" in "Relationships with co-workers". Despite these weak causal relationships, the goodness of fit of the model in this study met the criterion value, indicating that it was conceptually valid. This research emphasizes evaluating how employee satisfaction is triggered and how it can lead to the achievement of work goals.

Keywords: Sustainable work-style for individuals and team challenge, work motivation, reliability, validity, structural equation models

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1. Introduction

Motivation in general comes from a wide range of personal or social factors, such as financial compensation, recognition by the colleagues or superiors, or satisfaction coming from personal achievements ¹⁾. According to the 2014 public opinion survey on people's lives conducted by the Cabinet Office, when asked what the purpose of working was, 51.0% of respondents answered, "I work because I want money". 21.3% of respondents answered, "Work to find purpose in my life," and 14.7% answered, "I work to fulfill my duties as a member of society" ²⁾. In addition, rewarding work serves as a precedent for individual self-actualization and organizational outcomes ³⁾. It has been reported that the more specific and difficult the goal is, the higher the sense of accomplishment at work compared to situations where there is no goal or where the goal is abstract ⁴⁾. Additionally, it has been reported that achieving the goals of a team increases the sense of accomplishment even more than when achieved as an individual and creates unity in the organization ⁵⁾.

On the other hand, it has been reported that interest and motivation are significantly involved in the sense of accomplishment. It has been reported that Interest influence the direction, motivation, and persistence of goal-oriented behavior and that Interest may predict goal achievement in the workplace ⁶⁾. Interest directs one's goals toward a specific area and causes one to maintain effort and persistence to achieve the goal ⁷⁾. Motivation is the intensity of the desire to achieve a particular goal, regardless of how pleasant or unpleasant the experience of actually achieving it is. The motivational factor of reward, the feeling of "want", and the hedonic element of consuming it, the feeling of "liking", maintain remarkable evolutionary consistency in both human and animal brains ^{6,8)}. However, it is not yet clear what triggers a person in a particular situation or with a specific goal to take action and how intense or frequent that action is. Basically, what motivates people is the degree to which they have control over others, external objects, and themselves, which is reported to be the amount of effective interaction ⁹⁾. For some social psychologists and personality psychologists, motivation is related to mental expressions called goals, and goals are reported to generate activation and directional factors of motivation ¹⁰⁾.

There are various theories about the factors that influence interest and motivation, but it is still unclear. From a developmental perspective, it has been reported that interest is caused by the interaction between individual characteristics, such as increased knowledge and positive emotions, and the learning situation and learning content. Furthermore, it has been reported that curiosity caused by Interest has a strong relationship with employees' intrinsic motivation towards work ¹¹⁾. When employees view work as an enjoyable experience, they are more likely to engage in spontaneous and deep learning about the development of work-related knowledge ¹²⁾. Conversely, Interest and motivation are important factors that influence an individual's exploration behavior and learning orientation ¹³⁾. It has been reported that Interest and motivation are related to individual differences in employees' curiosity about work, goals and aspirations in life and cognitive style ¹³⁾. Motivation is also known to be influenced by genetic factors, and it has been reported that the magnitude of genetic and environmental influences is also related to the direction of achievement goals ¹⁴⁾. Although the influence of Interest in predicting educational and career choices, performance, and success has been reported, the mechanisms by which Interest influence these factors are not yet clear ⁶⁾. Understanding cause and effect in the development of Interest stabilizes the early stages of life ^{6,15)}. If it becomes clear how an individual's Interest and motivation are connected to the performance of their work, it is expected that this will lead to further self-awareness and growth in interpersonal relationships ¹⁶⁾.

Motivation has been reported to be essential for employees' sustainable work styles, and many previous studies in the

fields of organizational behavior, management, and psychology have defined interest and motivation¹⁷⁾. Regarding the work motivation, it has been reported that work intensity, direction, and persistence are related. Persistence refers to how long a person continues to try so that they are motivated enough to work long enough to achieve their goals^{17,18)}. However, it has been reported that an individual's persistence is influenced not only by his or her personality but also by factors such as gender, age, income level, type of work, and organizational level^{19,20)}. Because of the importance of motivation, numerous theories have been developed but there is still no general evaluation method for motivational theories. Until now several scales have been developed to evaluate sustainable work styles using motivation, but most of them evaluate internal motivation or extrinsic motivation¹⁷⁾.

On the other hand, multidimensional motivation scales have been developed that assess autonomous motivation, which represents a combination of intrinsic motivation and controlled regulation, and external regulation, both material and social²¹⁾. However, none of these measures evaluates motivation for work by considering an individual's physical and mental condition, characteristics, and feelings acquired through experience and learning based on those characteristics. Throughout his or her life, they form unique concepts through interactions and experiences with other people. The formation of concepts begins in childhood and develops throughout life, taking in information through experiences of touch, smell, sight, hearing, and taste²²⁾. Motivation is related to learning experiences, which directly and indirectly influence outcomes²³⁻²⁵⁾. To date, no scale has been developed to evaluate work motivation that considers personal characteristics such as conceptual formation and personality. Therefore, the aim of this study is to clarify how employees' Interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles.

2. Methods

2.1. Participants

Participants were sales and manager staff of a sole proprietorship who had contact with company A in Japan. Of the data of 1,946 employees collected in this survey (response rate 94.0%), only data with no missing values which mean is data that completed all the answers to all items were extracted, and the data of 1,693 workers were included in statistical analysis. The study information provided on the first page of the questionnaire emphasized the participants had the right to pull out from the study at any time. All participants read the consent form and responded only if they agreed. All methods were implemented following the Declaration of Helsinki. The average time taken by patients to complete the questionnaire was approximately 30 minutes.

2.2. Reliability testing

Regarding the internal consistency reliability testing of the Sustainable Work-styles for Individuals and Team Challenges (SWITCH) questionnaire, Cronbach's alpha coefficient was carried out because the questionnaire's responses were dichotomous in nature. The reliability coefficient result was interpreted as follows: values ≤ 0 indicated no agreement, 0.01-0.20 as none to slight, 0.21-0.40 as fair, 0.41-0.60 as moderate, 0.61-0.80 as substantial, and 0.81-1.00 as almost perfect agreement²⁶⁾.

2.3. Content validity

To validate the content validity of the constructs, A few expert panels were invited to review the items regarding item content representativeness of the constructs, clarity, relevance, and format. A panel of experts being made up of two categories: professional experts ²⁷⁾. Six professional university experts involved with the expertise in Quality of Life, educational measurement, and scale development. All the professional experts consist of senior lecturers, lecturers, or researcher at the university.

2.4. Construct validity testing

Confirmatory factor analysis (CFA) was used to assess construct validity by evaluating the similarity of the dimensions and factor loadings between domains. CFA is a statistical technique used to verify the factor structure of a set of observed variables. There is a suggested approach to CFA proceeds through the following process: a) review the relevant theory and research literature to support model specification, b) specify a model, c) determine model identification, d) collect data, e) conduct preliminary descriptive statistical analysis, f) estimate parameters in the model, g) assess model fit, and h) present and interpret the results ²⁸⁾. Structural equation models (SEM) are the validation process, which is to test construct validity research because this is a marriage of regression, path analysis, and latent variable modeling (often called factor analysis) (Structural equation modeling and test validation). The goodness of fit of the SEM model was assessed by four types of fit indices: chi-square statistic, root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), and comparative fit index (CFI) in this study. The ratio of the chi-square statistic to the respective degrees of freedom (χ^2/df) is preferred. Generally, chi-square is used as an absolute fit index, with a low chi-square value relative to the degrees of freedom (and higher p-value) indicating better model fit ^{29,30)}. The RMSEA is less than 0.08, and other fit indices such as GFI and CFI are greater than 0.90 ³¹⁾.

2.5. Statistical analysis

The sample size calculation was based on Confirmation Factor Analysis, as we expected, and including at least more than 200 participants was accurate for models with moderate misspecifications by Monte Carlo study ³²⁾. Hoe (2008) and Singh et al. (2016) reported that minimum sample sizes in absolute sample size was any $n > 200$ offers adequate statistical power for data analysis ^{33,34)}. The data collected from the self-reported questionnaire was analyzed by structural equation modeling (SEM). The analyses were performed using SPSS 22.0 and AMOS 23.0 (IBM, NY, USA). All statistical tests were two-sided, and $p < 0.05$ was considered statistically significant. Continuous variables conforming to a normal distribution are shown as the mean and standard deviation, and those not conforming to a normal distribution are expressed as the median (Interquartile range). Categorical variables are expressed as the number of cases (Percentage).

3. Results

3.1. Draft of the questionnaire

Based on the previous research mentioned in the table 1 to table 7, we devised a theoretical hypothesis by which employees' Interest and motivation led to the achievement of goals in the workplace in this study (Figure 1). External stimuli such as music, movies, reading, sports, and information from others are the triggers that trigger his or her SWITCH. The way in which various stimuli are received differs depending on the individual's conceptual formation, which is

composed of visual, auditory, experience, language, and numbers, as well as their individuality, which consists of physical and mental health, attentiveness, and behavioral characteristics. These potential causes lead to people's Interest involve emotional and cognitive aspects and motivation. The emotional dimension includes the experience of emotions such as enjoyment and excitement. The cognitive dimension includes the intellectual desire to acquire new knowledge. Emotional aspects can also lead to cognitive aspects. Interest and motivation lead to achieving goals at work. Motivation is also an essential driving force for accomplishing work tasks. However, motivational influencing factors are not only intrinsic but also external. It is the employee's work environment and interpersonal relationships with co-workers. External factors can have an impact on intrinsic motivation and job performance (Figure 1).

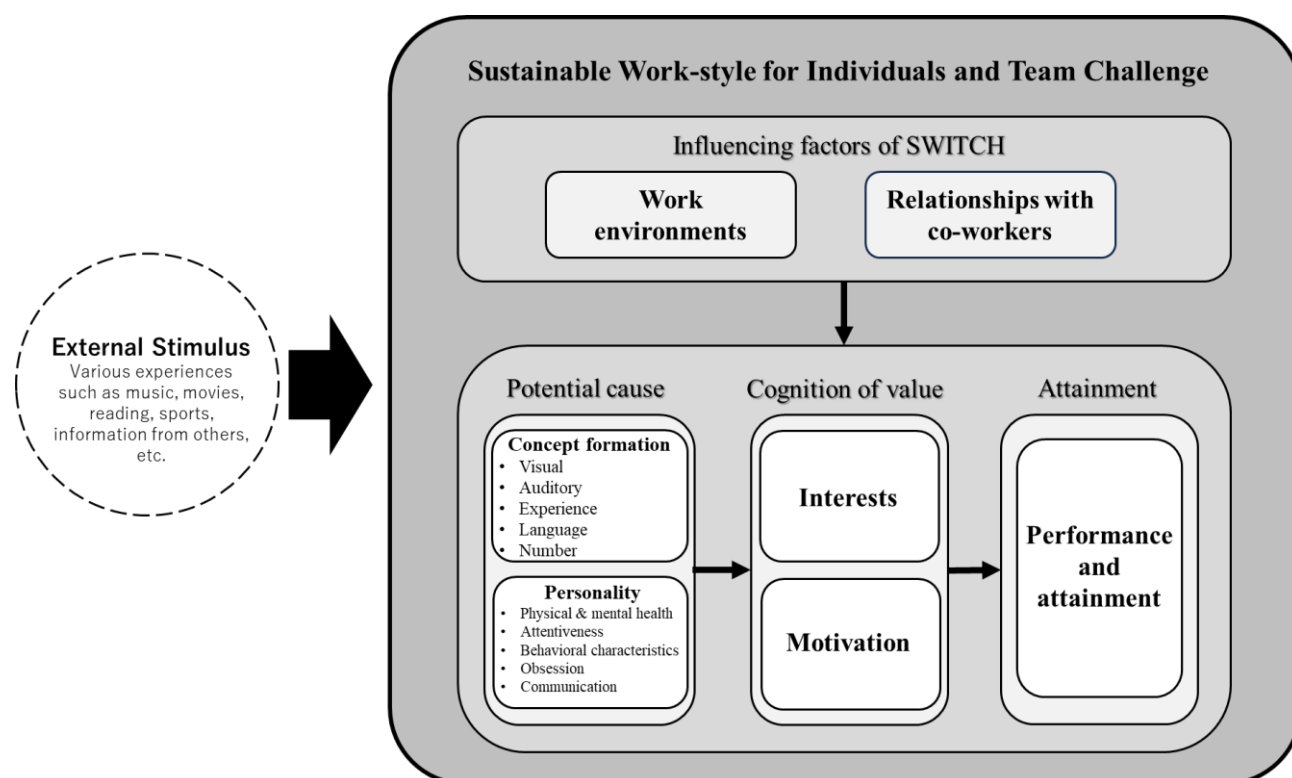


Figure 1. Theoretical hypothesis of SWITCH

3.2. Rational for all sub-domain of SWITCH

3.2.1. The sub-domain of “Work environment” and “Relationships with co-workers”

The International Classification of Functions, Disabilities and Health (ICF) classifies environmental factors related to an individual's life functions into three categories: “Physical environment”, “Human attitudes”, and “Social institutions and services”³⁵). In this study, those three categories were defined as “Human resource maintenances”, “Materials resource maintenance”, and “Welfare benefits” as the sub-domain of “Work environments” (Table 1).

Table 1. Definitions, item examples and evidence for “Work environments” subdomain

Human resource maintenances	
Definition	Adjustments to personnel assignments, environmental settings, etc., made by the company for the purpose of ensuring that employees perform their work properly.
Items	<ul style="list-style-type: none"> • The work environment is conducive to consulting with a supervisor • The environment is conducive to communication with colleagues • Recruitment is being done properly
Total 6 items	
Evidence	<ul style="list-style-type: none"> • Masahide O. “The Quality of Working Life” studies: their present states, problems, and needed future directions. <i>Studies in sociology, psychology and education</i>, 1991, 33, 45-53. • Akada T. Nursery Teacher’s Stress Scale (NTSS): Reliability and Validity. <i>The Japanese Journal of Psychology</i>, 2010, 81(2), 158-166. • Manabe E et al. Correlation between Sense of Coherence and Satisfaction and Work Environment and Nursing Clinical Skills among Nurses at University Hospitals. <i>Journal of Japan Society of Nursing Research</i>, 2012, 35, 19-25. • Kulkarni P.P. A Literature Review on Training & Development and Quality of Work Life. <i>International Refereed Research Journal</i>, 2013, IV(2), 136-143.
Materials resources maintenances	
Definition	Adjustment of the physical environment of the workplace, such as lighting, air conditioning, sanitation, etc., by the company for the purpose of improving the work efficiency of employees.
Items	<ul style="list-style-type: none"> • Air conditioning environment can be regulated through the use of heating and cooling equipment, etc • The brightness of the room can be adjusted by utilizing indirect lighting, etc • Space for individual work, exists in the workplace
Total 5 items	
Evidence	<ul style="list-style-type: none"> • The Japan Institute for Labour Policy and Training (2012) Research on Job Structure: Numerical Analysis of Occupations and Study from Occupational Mobility (in Japanese). • Shoji T et al. A Study on the Task Performance on the Different Thermal Conditions. <i>Specific Research Reports of the National Institute of Industrial Safety</i>, 2003, 28, 49-61.
Welfare benefits	
Definition	Benefits provided by the company for the purpose of improving the economic and social conditions and lives of employees.
Items	<ul style="list-style-type: none"> • Services related to housing are provided • Services related to health and medical are provided • Services related to life support are provided
Total 6 items	
Evidence	<ul style="list-style-type: none"> • Ohta S. An Economic Approach to Corporate Benefits. <i>The Japanese Journal of Labour Studies</i>, 2007, 564, 20-31 (in Japanese). • Matsuda Y. Study on today’s changes in company’s employee welfare: On the basis of researches for Japanese companies. <i>The Journal of the Association of Economics Okayama Economic Review</i>, 2004, 36(3), 75-89 (in Japanese).

Regarding the sub-domain of “Relationships with co-worker”, we have established “Awareness of diversity” and “Building trusting relationships”. It has been reported that the negative impact on motivation is reduced because the employee’s sense of belonging is directed towards his/her organization ³⁶⁾. A survey on nurses have shown that relationships in the workplace have a positive impact on emotional organizational commitments ³⁷⁾. In the “Relationship with co-workers” in this study, it was predicted that improving human relations in the workplace would increase the sense of belonging to the organization and maintain motivation. Therefore, based on the subjectivity of the evaluator, “Awareness of diversity” and “Building trusting relationships” were set to evaluate the degree to which colleagues are involved in the workplace (Table 2).

Table 2. Definitions, item examples and evidence for “Relationships with co-workers” subdomain

Awareness of diversity	
Definition	Attitude of those who work together in the workplace toward diverse others with different experiences and backgrounds, trying to understand the differences in their opinions and positions.
Items	<ul style="list-style-type: none"> • Are the people around you trying to understand the situation from your perspective? • Are people around you trying to understand your feelings from your perspective? • Are people around you trying to understand different opinions?
Total 5 items	
Evidence	<ul style="list-style-type: none"> • Watanabe N. A Study of Mental Health in Work Organization Based on ERG Theory. Bulletin of the School of Education. The Department of Education Psychology, 1982, 29, 263-277. • Hiramatsu T. What the Business Communication is. Kumamoto Journal of Culture and Humanities, 2007, 95, 85-119. • Suzuki Y et al. Development of the Multidimensional Empathy Scale (MES): Focusing on the Distinction Between Self-and Other-Orientation. The Japanese Journal of Educational Psychology, 2008, 56(4), 487-497.
Building trusting relationships	
Definition	Attitudes of people who work together in the workplace toward the values of others.
Items	<ul style="list-style-type: none"> • Are people around you listening to what you are saying? • Do people around you relate to you in a way that makes you feel safe? • Do people around you respect your ideas?
Total 3 items	
Evidence	<ul style="list-style-type: none"> • Watanabe N. A Study of Mental Health in Work Organization Based on ERG Theory. Bulletin of the School of Education. The Department of Education Psychology, 1982, 29, 263-277. • Hiramatsu T. What the Business Communication is. Kumamoto Journal of Culture and Humanities, 2007, 95, 85-119. • Suzuki Y et al. Development of the Multidimensional Empathy Scale (MES): Focusing on the Distinction Between Self-and Other-Orientation. The Japanese Journal of Educational Psychology, 2008, 56(4), 487-497.

3.2.2. The sub-domain of “Concept formation” and “Personality”

As a result of the content validity, five sub-domains of “Concept formation” were established in this study: “Visual concept”, “Auditory concept”, “Physical concept”, “Verbal concept” and “Numerical concept”. People act and choose based on what they see, what they feel, and believe; meanings and values are part and parcel of our actions ³⁸⁾. Concept formation begins in infancy, though their senses of touch, smell, sight, hearing, and taste children take in information. When infants look around their environment they gain a sense of size, weight, and shape. They learn that many things are heavier than they can lift through their experiences ³⁹⁾. Early literacy and mathematical conceptual skills have a long-term impact on quality of life, and studies of adults have linked core abilities with employability and wages ⁴⁰⁻⁴²⁾. Bryan et al. reports that the relatively small amount of age-related variance in verbal fluency suggests that verbal fluency performance is well maintained with increasing age. Moreover, initial letter fluency performance seems to rely more on participants’ verbal knowledge than on speed of processing, and excluded letter fluency performance seems to rely more on speed of processing than on verbal knowledge ⁴³⁾. Therefore, we decided to evaluate the concepts related to vision and hearing, the concepts related to using the body, the concepts related to the quality and quantity of objects, and finally the concepts related to vocabulary (Table 3-1,2).

Table 3-1. Definitions, item examples and evidence for “Concept formation” subdomain

Visual concept	
Definition	The effects of visually related concepts such as color and shape perception on the work.
Items	<ul style="list-style-type: none"> • Can remember other people’s faces • Able to understand and respond to situations based on people's words, actions, and facial expressions • Able to act on information from maps, photos, illustrations, and other images <p style="text-align: right;">Total 10 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students’ Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Auditory concept	
Definition	The effects of Auditory-related Concepts, such as listening to sounds and noticing changes in sound, on the work.
Items	<ul style="list-style-type: none"> • Able to identify the direction of the sound • Able to hear the difference in intensity of sound • Able to hear the difference in tempo of sound <p style="text-align: right;">Total 8 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Experience concept	
Definition	The Effects of concepts related to touch, smell, posture, and movement on work.
Items	<ul style="list-style-type: none"> • Able to notice differences in hardness by touching things • Touching things to notice differences in weight • Able to notice differences in shape from the contours of objects touched <p style="text-align: right;">Total 11 items</p>
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant’s Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.

Table 3-2. Definitions, item examples and evidence for “Concept formation” subdomain

Language concept	
Definition	The effects of language-related concepts, such as the use of situational language and the accurate conveyance of information in words, on the job.
Items	<ul style="list-style-type: none"> • Understand people's relationships based on the content of their conversations • Able to describe in words the location of people and objects • Able to explain the time flow of things in words
Total 15 items	
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant's Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.
Number concept	
Definition	The effects of mathematical thinking, processing of information, and other number-related concepts on the work.
Items	<ul style="list-style-type: none"> • Able to count and grasp the quantity and number of objects • Able to read the numbers as soon as they are seen • Able to quickly solve for numbers mentioned in conversation
Total 13 items	
Evidence	<ul style="list-style-type: none"> • McQuaid PT et al. The Concept of Employability. <i>Urban Studies</i>, 2005, 42(2), 197-219. • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20. • Watanabe K. Development of Students' Transferable Skills in College (I) --Consideration of New Skills and A Longitudinal Study of Its Change--. <i>Journal of Osaka University of Economics</i>, 2018, 69(1), 27-48. • Han C. Development of a Structural Valuation Tool for Grasping Actual Situation of Infant's Concept Formation and Talent Excavation. <i>Journal of Inclusive Education</i>, 2019, 6, 27-40.

In the “Personality” domain, five sub-domains were established: “Physical and mental health”, “Attentiveness”, “Behavioral characteristics”, “Obsession” and “Communication”. Personal factors play an essential part in effecting health problems and the impact of disability on inclusion in society. According to one report, which systematically categorizes personal factors based on the ICF, personal factors are classified by physical factors related to body function, mental factors related to psychological stability, emotional status, and openness to new experiences such as willingness to change, cognitive factors related to attention, behavior patterns, and social skills ⁴⁴⁾. In addition, it has been reported that people potentially have two aspects, impulsiveness, and compulsiveness and that these aspects are independent but positively correlated with each other ⁴⁵⁾. Personality characteristics also appear to have a significant impact on the problems of turnover and absenteeism in worker. The meta-analytic study report that personal traits do have an impact on individuals' turnover intentions and behaviors ^{46,47)}. This study was set up to evaluate the characteristics of an individual's behavior, in addition to the health conditions necessary to continue working, so that motivation and its relationship to the environment could be assessed (Table 4).

Table 4. Definitions, item examples and evidence for “Personality” subdomain

Physical and mental health	
Definition	The effects of physical and mental health on work.
Items	<ul style="list-style-type: none"> • Feel sluggish and tired on a daily basis and have difficulty getting rid of fatigue • Feeling depressed or melancholy at times • Sometimes the little things make me angry and frustrated
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.
Total 9 items	
Attentiveness	
Definition	The effects of concentration and the environment for concentration on work.
Items	<ul style="list-style-type: none"> • Trying to concentrate on work, but sometimes distracted by ambient noise • Forgetting appointments or forgetting things • Sometimes lack of attention to detail or making simple mistakes
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.
Total 7 items	
Behavioral characteristics	
Definition	The effects of controlling one's own behavior and the environment on work.
Items	<ul style="list-style-type: none"> • Unable to sit still and fidget • In situations where you have to sit for long time, such as in a meeting, and feel the need to leave the seat • Sometimes when calm behavior is required, it is not possible to do so
Evidence	<ul style="list-style-type: none"> • Han C et al. Development of the IN-Child (Inclusive Needs Child) Record. <i>Total Rehabilitation Research</i>, 2016, 3, 84-99. • Han C et al. Development of Scale for Coordinate Contiguous Career; Scale C³. <i>Journal of Inclusive Education</i>, 2018, 4, 1-20.
Total 6 items	

3.2.3. The sub-domain of “Interest” and “Motivation”

Motivational factors are intrinsically related to work. There are several reports that the overall success of the enterprise is affected by the performance of properly motivated employees. According to Hitka et al. (2021), An interest in the level of employee motivation and employee satisfaction is becoming of vital importance ⁴⁸⁻⁵⁰). As a macro theory explaining human motivation, self-determination theory (SDT) has been widely applied to investigate individuals controlled and autonomous motivation at work. On the other hand, Feelings of interest are broad and are not restricted to feelings of curiosity, whereas feelings of curiosity are largely associated with the feelings of interest and may transition into feelings of interest. People’s exploration/examination behavior for specific information is depicted as a key factor that links feeling of curiosity and of interest. When knowledge exploration reaches its goal-the knowledge gaps have been satiated—positive emotion follows ⁵¹). Curiosity has its root in human motivation and makes people seek out knowledge, meaningfulness, understanding and sense-making, and thus profoundly influences individuals’ self-regulation and the formation of cognitive capabilities ⁵²). Curiosity appears to be an indication of an employee’s job motivation ⁵³).

Therefore, in this study, the domain of interest was set up in Social Cognitive Career Theory (SCCT) as a factor that leads to behavioral goals. It was set as a factor leading to motivation. Individual interest is defined as being caused by

deficient needs, and items were set up to assess needs for comfort, safety, and socialization (Table 5). Regarding the domain of “Motivation”, the factors of exploration, persistence, and enhancement were set as evaluation items as triggers for achieving sustainable work styles (Table 6). According to Maslow’s hierarchy of needs theory, when the basic human needs (physiological, safety, and group) are satisfied, the need for approval and self-actualization arise as higher-order needs. Exploration and persistence were evaluated as a means of self-actualization. And together with the evaluation of the need for approval, were set as evaluation domains of motivation.

Table 5. Definitions, item examples and evidence for “Interest” subdomain

Interest	
Definition	Interest and curiosity about external stimuli, places, and people.
Items	<ul style="list-style-type: none"> • Comfort of the working space is needed • Comfort for the wearer is needed • Want to know how reliable things are
Total 8 items	
Evidence	<ul style="list-style-type: none"> • Maslow A. <i>Motivation and Personality</i>. 1954. New York : Harper & Row. • Hane T. The Concept and Aspects of Comfort. <i>The Japanese Journal of Ergonomics</i>, 1993, 29(2), 49-57. • Murray HA et al. <i>Explorations in Personality (70th edn)</i>. 2007. Oxford: Oxford University Press.

Table 6. Definitions, item examples and evidence for “Motivation” subdomain

Motivation	
Definition	Motivation to try new things, to work persistently, to gain social recognition, etc.
Items	<ul style="list-style-type: none"> • Able to see difficult situations as an opportunity for personal growth • Have something that keeps it fun and keeps it going • Want to be admired by others
Total 9 items	
Evidence	<ul style="list-style-type: none"> • Maslow A. <i>Motivation and Personality</i>. 1954. New York : Harper & Row. • Shimazu A et al. Work engagement in Japan: Validation of the Japanese version of Utrecht Work Engagement Scale. <i>Applied Psychology: An International Review</i>, 2008, 57, 510-523. • Saito J et al. Development of the Values Clarification Questionnaire and Confirmation of Its Reliability and Validity. <i>Japanese Journal of Behavior Therapy</i>, 2017, 43(1), 15-26. • Kashdan TB et al. The five-dimensional curiosity scale: Capturing the bandwidth of curiosity and identifying four unique subgroups of curious people. <i>Journal of Research in Personality</i>, 2018, 73, 130-149.

3.2.4. The sub-domain of “Performance and attainment”

In this study, three subdomains were established in the “Performance and attainment” domain: “Effort”, “Achievement”, and “Social evaluation”. Intrinsically motivated employees work on tasks because in turn should accentuate their task-directed effort. Achievement strivings is associated with work performance through its influence on concentration ⁵⁴⁾ and the rewards have a significant positive impact on employee performance ⁵⁵⁾. As indicated in SCCT, the consequences of an individual’s actions become experiences when they are feedback and form a person’s cognition, including motivation ⁵⁶⁾. Therefore, we assessed job accomplishment as a result of work behavior and social evaluation as its feedback (Table 7).

Table 7. Definitions, item examples and evidence for “Performance and attainment” subdomain

Effort	
Definition	Actions taken to achieve goals.
Items	<ul style="list-style-type: none"> • Specific goals were set to achieve the objectives • Communicated with others to achieve goals • Scheduling was done to achieve goals
Total 4 items	
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.
Achievement	
Definition	Subjective evaluation of the experience of achieving the objective.
Items	<ul style="list-style-type: none"> • The results were close to the goals set by myself • Communication with those around us led to results • Scheduling led to results
Total 4 items	
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.
Social evaluation	
Definition	Recognition and rewards from others for efforts and achievements.
Items	<ul style="list-style-type: none"> • The financial rewards were commensurate with the effort and achievement • Received deserved recognition for efforts and achievements from superiors • Received deserved recognition for efforts and achievements from colleagues
Total 4 items	
Evidence	<ul style="list-style-type: none"> • Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. <i>Psychological Review</i>, 1977, 84(2), 191-215. • Siegrist J et al., The measurement of effort–reward imbalance at work: European comparisons. <i>Social Science & Medicine</i>, 2004, 58(8), 1483-1499. • De Cooman R et al. Development and validation of the Work Effort Scale. <i>European Journal of Psychological Assessment</i>, 2009, 25(4), 266-273. • Toyota H et al. The Effects of Causal Attribution by Contingency between an Effort and a Result on Motivation. <i>Bulletin of Teacher Education Center for the Future Generation</i>, 2017, 3, 23-30.

The SWITCH is a self-report questionnaire consist of 143-item and 7-domain. Respondents use a 5-point Likert-type scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) to respond to the items. Of the 143 items, none were reversed. Participants assess how well each statement described their typical feelings toward themselves. Higher scores on the scale indicate higher levels of working sustainably.

3.2. Demographic Characteristics

Table 8 shows the demographic characteristics of the participants. Among the participants, 97.7% were women. In terms of age range, participants in their 40-49 years were the most common (33.0%). The participant with the lowest age range was the 80-89 years (0.2%). Regarding the occupation, sales staff was the most common (85.8%). The number of years of services was 8.2 years.

Table 8. Demographic characteristics of the participants

Sex, n (%)			
	Female	1654	(97.7)
	Male	31	(1.8)
	No answer	8	(0.5)
Age range, n (%)			
	20-29 years	217	(12.8)
	30-39 years	512	(30.2)
	40-49 years	559	(33.0)
	50-59 years	284	(16.8)
	60-69 years	78	(4.6)
	70-79 years	31	(1.8)
	80-89 years	4	(0.2)
	No answer	8	(0.5)
Occupation, n (%)			
	Sales staff	1452	(85.8)
	Management staff	169	(10.0)
	Other	41	(2.4)
	No answer	31	(1.8)
Years of service, mean (SD)		8.2	(8.8)

SD; standard deviation

3.3. Reliability

As a result of reliability using Cronbach's α coefficient, the reliability coefficient for the entire scale was 0.967. Regarding each domain, the reliability coefficients were 0.968 for concept formation, 0.911 for personality, 0.778 for interest, 0.837 for motivation, 0.915 for performance and attainment, 0.881 for work environment, and 0.926 for relationships with co-workers. Additionally, reliability coefficients greater than 0.700 were found in all subdomains.

Table 9. The results of reliability

Domains	Subdomains	Cronbach's alpha
Concept formation		.968
	Visual concept	.851
	Auditory concept	.874
	Experience concept	.866
	Language concept	.939
	Number concept	.934
Personality		.911
	Physical and mental health	.823
	Attentiveness	.808
	Behavioral characteristics	.834
	Obsession	.766
	Communication	.729
Interest		.778
Motivation		.837
Performance and attainment		.915
	Effort	.884
	Achievement	.880
	Social evaluation	.838
Work environments		.881
	Human resource maintenances	.890
	Materials resource maintenances	.810
	Welfare benefits	.828
Relationships with co-workers		.926
	Awareness of diversity	.893
	Building trusting relationships	.915
Total		.967

4. Construct validity

As a result of analysis using structural equation modeling, the model in Figure 2 showed the best fit of each index. The SEM showed that the fit of the model is good with RMSEA of 0.067, GFI of 0.926, and CFI of 0.927. On the other hand, the chi-square value is 8.486. The SEM analysis revealed the relationship between each domain. A very strong and positive relationship was found between “Concept formation” and “Visual concept” (path coefficient = 0.79, $p < 0.001$), “Auditory concept” (path coefficient = 0.83, $p < 0.001$), “Experience concept” (path coefficient = 0.78, $p < 0.001$), “Language concept” (path coefficient = 0.85, $p < 0.001$), and “Number concept” (path coefficient = 0.74, $p < 0.001$). There are moderate and positive relationship found between “Relationship with co-worker” and “Personality” (path coefficient = 0.40, $p < 0.001$). However, the “Personality” was very strong and positive relationship with “Concept formation” (path coefficient = 0.84, p

< 0.001). Regarding the “Relationship with co-worker”, not only “Awareness of diversity” but also “Building trusting relationship” was very strongly correlated (path coefficient = 0.86 and 0.84, all of $p < 0.001$). However, the “Concept formation” was weak correlated with “Relationship with co-worker” (path coefficient = 0.29, $p < 0.001$). Regarding the “Personality”, not only “Attentiveness” but also “Communication” was strong correlated (path coefficient = 0.78 and 0.77, all of $p < 0.001$) while “Physical and mental health”, “Behavioral characteristics” and “Obsession” was moderately correlated (path coefficient = 0.56, 0.67 and 0.57, all of $p < 0.001$) (Figure 2).

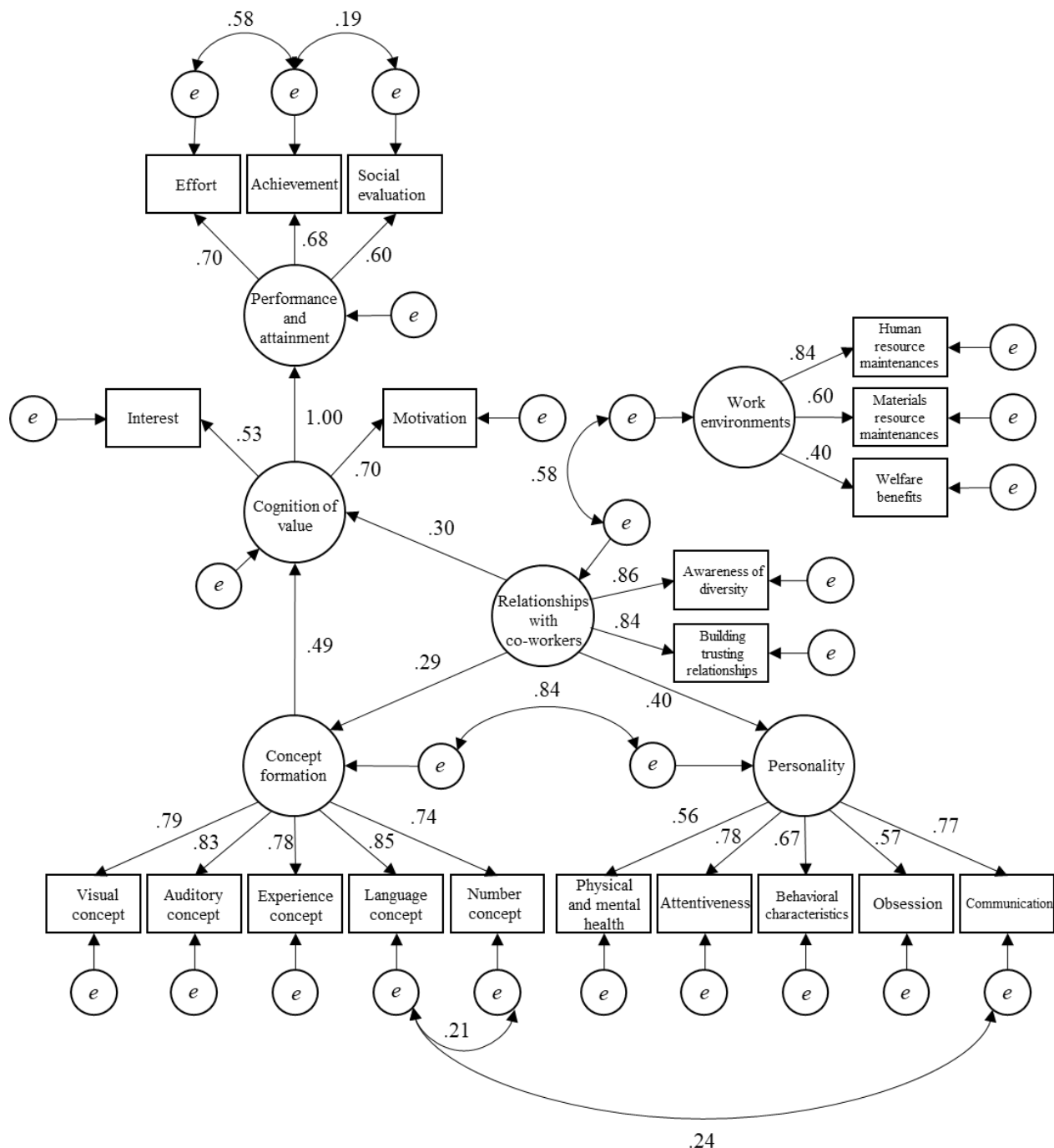


Figure 2. The results of construct validity

5. Discussions

This study aims to clarify how employees' Interest and motivation, considering their personal temperament and work environment, lead to goal achievement, and develop a scale to measure sustainable work styles. The SWITCH questionnaire to collect the data on sales and management staff mainly. When the reliability of the path diagram created based on the theoretical background was verified, the Cronbach alpha coefficient was more than 0.9 overall, and more than 0.7 in all domains. In addition, in the verification of the construct validity, all indicators of RMSEA, CFI and GFI met the goodness-of-fit criteria, and the its validity as an evaluation scale was verified.

In this study, regarding the indicator variables in the path diagram, the indicator for “Relationships with co-worker” had a moderate correlation with “Work environment”. The work environment supports individuals' career growth, learning, and development, and colleagues and supervisors are reported to be the primary sources of development assistance and support for individuals ⁵⁷⁾. According to Shahidan et al. also reported that peer relationships promote a healthy and positive work environment that can contribute to a healthy life in the social community ⁵⁸⁾. Our study found a relationship between interpersonal relationships with co-workers and the work environment, a result consistent with these previous studies ^{57,58)}. Relationships with co-workers will help to understand the characteristics of individual employees and meet their work style needs, and they will also enable positive feedback by allowing appropriate evaluation of work accomplishments ³⁷⁾. The SWITCH-based evaluation will provide clues for understanding and improving the state of the environment and human relations within the organization.

On the other hand, there was a weak causal relationship between “Personality”, “Concept formation”, “Interest”, and “Motivation” in “Relationships with co-workers”. Relationships with non-formal colleagues in the workplace are reported to be important for supporting career development and sharing the organizational and job-related knowledge needed to perform tasks ⁵⁹⁾. It has been reported that team performance is higher than individual performance in jobs that require a wider range of knowledge, judgment, and opinions ⁶⁰⁾. This is thought to be because cooperation and teamwork with colleagues are given priority over showing off one's individuality. In addition, regarding the relationship between “Relationships with co-workers” and “Interest” and “Motivation”, it cannot be said that “Interest” and “Motivation” is necessarily related to interactions with others in this study. The phenomenon of intrinsic motivation was first recognized in experimental studies of animal behavior, where many organisms exhibit exploratory, playful, and curious behavior on their own, even in the absence of reinforcement or reward relationships ^{61,62)}. In addition, it is said that humans naturally simply enjoy activities that have worked well in the past and tend to continue those actions for their own sake ⁶³⁾. Intrinsic motivation and the resulting behavior may not necessarily be caused by relationships with others. However, despite the weak causal relationships between these domains and “Relationship with co-worker”, the goodness of fit of the model in this study met the criterion value, indicating that it was conceptually valid. Moreover, most of the subjects of this study are sales staff who are self-employed and have a unique work environment as they are free to decide their working hours.

Another interesting thing is that moderate or higher causal relationships were observed between “Concept formation”, “Personality”, “Interests”, and “Motivation”, and very strong correlations were observed between concept formation and personality in particular. Through this scale, it is possible to understand the status of an individual's past learning experience and to understand how an individual's aptitude matches the job, regardless of the specific organization or job type. This can also be expected to be used to consider the training necessary to improve an individual's career. In conclusion, the SWITCH can be used in a valid and reliable way so as to determine the sustainable work styles for employees, including

sales staff and manager staff, by clarifying how their interests and motivations lead to achieving their goals. In order for a scale to be of high quality and beneficial, it should be used in various research attempts and for different samples on different occasions, and validity and reliability investigations should be conducted.

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ORIGINAL ARTICLE

The Influence of Self-Efficacy towards Self-Motivation in the Land Administration Delivery System

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ABSTRACT

Individual land rights are subject to complex processes and procedures related to land administration. Land administration is viewed as an important focal point for economic growth in Malaysia. The effectiveness and efficiency of public service delivery are predictors of job performance for public servants. This article aims to investigate the influence of self-efficacy on self-motivation among public servants in delivering land services. Mixed-method studies were carried out among 278 participants from public servants linked with numerous district land offices in the north region of peninsular Malaysia (Kedah). Summarily, quantitative data demonstrated that the majority of public servants in land administration have a high level of self-efficacy, which is parallel to a high level of motivation. The obtained qualitative data, on the other hand, were analyzed thematically, yielding two key themes: (1) factors affecting motivation positively and (2) factors affecting motivation negatively.

Keywords: Self-Efficacy, Motivation, Land Administration, Delivery System

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1. Introduction

In our society nowadays, the main concern whilst dealing with land administration departments, which include the District Land Office (Pejabat Tanah Daerah), the Office of Land and Mines (Pejabat Pengarah Tanah dan Galian), and the Department of Director General of Lands and Mines (Jabatan Ketua Pengarah Tanah dan Galian), seems to be the standard of service delivery to the public, stakeholders, investors, and other government or private agencies (Mohd Ali et al., 2019)²⁴. Malaysian land administration, however, has been frequently chastised for inefficiency in the public delivery system (Samsudin, 2011)³². The reputation for being 'slow' appears to be synonymous with land offices, particularly at the district level, which is the most accessible to the public. The reputation and perception of public servants are influenced by the quality of the services they provide. This article places emphasis on the idea that providing services involves not only the services themselves but also the people or group of staff members who are in charge of delivering those services. One of the most significant factors affecting the service's quality, according to Hooper et al. (2013)¹⁵, is the employee. Employee conduct and attitude within land administration departments are extremely important because they serve as a direct reflection of the government, among other things. Given that the public sector is a key contributor to the nation's economy, the motivation of public employees is crucial (Kaur & Sharma, 2022)¹⁸. The desire of public employees to advance the common good is, in fact, what drives public services most. In light of this, it stands to reason that public servants who genuinely want to serve the public will be highly motivated to carry out their duties (Jacob and Dermengi, 2022)¹⁶. In order to occasionally increase the efficiency and effectiveness of service delivery quality, this article tries to explore the significance of self-efficacy on employees' motivation in land administration departments.

2. Literature Review

2.1. Self-Efficacy

The concept of self-efficacy refers to an employee's confidence in themselves or an organization in the workplace (Ozyilmaz, Erdogan & Karaeminogullari, 2017)²⁹. Self-efficacy may influence how someone feels, thinks, and behaves at work. Accordingly, self-efficacy has a significant influence on the employee's behavior and actions. As it is one of the factors that influence how people behave, the idea of self-efficacy is crucial in the workplace (Song et al., 2018)³³. In the study of self-efficacy, there are four sources identified: mastery experience, vicarious experience, verbal persuasion, and physiological state (Cox & Simpson, 2016⁶; Ooi et al., 2018²⁸). All the given sources affect the level of self-efficacy among the employees.

First of all, direct learning leads to the emergence of efficacy beliefs and expectations (mastery experience). The execution of similar tasks is referred to as "mastery experience" (Ooi et al., 2018)²⁸. In the public sector, mastery experience includes both the accomplishments of the organization and the experience of top coworkers or officials. Instead of attending land law and policy courses and seminars, new officers are frequently urged to benefit from the mastery experience of senior officials. Vicarious experience, which is the observation of others' achievement or failure, is a second type of self-efficacy (Versland, 2016)³⁶. Vicarious experience might be offered through the phenomenological technique or fieldwork observation. The land officers' successes and failures can be learned about during the qualitative session. When investigating the effects of self-efficacy on self-motivation, land officers with extended service histories in land administration departments can provide valuable insight. Social persuasion is a term used to describe the third source. The phrase "social persuasion" describes verbal and nonverbal cues that reflect one's confidence in one's ability to do tasks.

Versland (2016)³⁶⁾ asserts that positive feedback on work performance may increase employees' self-confidence in their capacity to perform well. In this study, we examine the impact of public criticisms and complaints aimed at the delivery system for land administration as a source of social persuasion. Both verbal and nonverbal criticism can have positive or negative effects. Negative effects include depression and a lack of motivation, for instance. On the other side, a positive effect refers to an improvement in self-motivation to enhance job performance. The last source, namely psychological state, may be used to further explore the actions and attitudes of land officials in reaction to complaints and criticism. Another aspect that affects how employees see their work is their physical state, which includes tension and anxiety brought on by the workplace (Ooi et al., 2018)²⁸⁾. Public employees, especially those who work as "front-liners," may suffer from stress and anxiety brought on by the workplace environment, which could affect their motivation and performance on the job. The public is more likely to see front-line personnel than other categories of government workers.

2.2. Motivation

Self-beliefs of efficacy play a key role in the self-regulation of motivation (Bandura, 1994). They determine the goals people set for themselves, how much effort they expend, how long they persevere in the face of difficulties, and their resilience to failures. Bandura (1994)²⁾ shows the connection between self-efficacy and motivation in people. With high self-belief in efficacy, employees are more prone to stressful events, especially in the workplace environment. Dealing with the public is not an easy task and requires high-resilience employees. According to MacDonald et al (2014)²²⁾, motivation depends on a person's desire to accomplish a particular goal. Employees who are motivated will have a certain amount of drive and commitment to a job. All of these definitions emphasize the significance of motivation for everyone, notably at work, as it may boost one's motivation to achieve goals. In essence, there are two different types of motivational sources: internal motivation (intrinsic motivation) and external drive (extrinsic motivation). The core of intrinsic motivation is achieving desired employee outcomes like performance and commitment. Contrarily, extrinsic motivation refers to rewards for work efforts that are intangible or immaterial (such as money or bonuses) (such as social status and prestige) (Ritz, Neumann & Vandenabeele, 2016)³⁰⁾. In this study, these two types of motivation describe the sources of motivation that employees may have to complete the assigned task at work. Motivation may derive from a person's internal motivation and also from their environment at work. In addition to the different types of motivation sources, the motivation-hygiene theory offers an in-depth understanding of motivation in the public sector. The Herzberg theory was first presented by Frederick Herzberg (Dudovskiy, 2011)⁹⁾. The Herzberg theory of motivation is the best fit for analyzing the findings of this study. According to Herzberg, motivation can be divided into two categories: hygiene factors and motivators, which include demanding jobs, responsibility, and achievement (such as salary, status, relations to managers and colleagues, and security). On the second point of contention, Dudovskiy (2011)⁹⁾ asserts that the motivator factors produced high levels of employee motivation, loyalty, and contentment. Meanwhile, hygiene factors contributed to overall happiness and avoided dissatisfaction. According to Herzberg's motivation-hygiene theory, it is crucial for public employees to meet all hygienic requirements in addition to the motivators so they can advance their careers in terms of their service to the public, overall job satisfaction, and professional development. At this point, the quality of service delivery to the public highly depends on the motivation of public employees. The attitudes of each person working in the public sector reflect the quality of the services provided. Indeed, public employees are the most connected to society.

2.3. Land Administration Delivery System

Services related to land administration include ensuring tenure security, promoting sustainable land use, reducing land disputes, and providing a foundation for property value and taxation (quit rent) (Van Oosterom & Lemmen, 2015)³⁵⁾. This article primarily focuses on the land administration system in Peninsular Malaysia, which adheres to the National Land Code of 1965 (NLCC) to ensure uniformity and reliability of the land administration delivery system. Over the years, the majority of academics have primarily concentrated on the effectiveness of the system used in the land administration department and on land development in the land administration research area (Marzuki et al, 2012)²³⁾. The phrase "delivery system" offers a more expansive definition, first and foremost. Delivery units, according to McKinsey, are "a small team of committed people focused solely on generating impact and enhancing outcomes for the proposed research" (Narasimhan & Pillai, 2018)²⁶⁾. As a result, the delivery system for land administration encompasses numerous groups of people that are only interested in making an impact and improving outcomes. All government employees who work in land administration departments are also included in the land administration delivery system. Delivery services are thought to be crucial for long-term growth (Narasimhan & Pillai; 2018)²⁶⁾. Maintaining the public's confidence in government services depends on sustainable development in the delivery of land administration services. Other than that, public employees must work effectively and efficiently to meet the requirements of the public. To improve its delivery system and make it more effective and efficient, the public sector must (Ali & Buang, 2016¹⁾). In fact, the effectiveness and efficiency of service delivery establish the credibility of public employees as community-serving government representatives. On the other hand, this study places more emphasis on human resources than the system used in land administration departments. In the study carried out by (Halid & Ahmad Kamal, 2019)¹⁴⁾, the effectiveness of the human resources division within the land administration departments is one of the areas audited for the Land Administration Star Rating System (LASRS), also known as Sistem Star Rating (SSR) Pentadbiran Tanah, to examine the effectiveness and quality of land administration. Prior studies, however, did not investigate the long-debated need for a social policy and human resources unit in land administration departments. The previous study by Isahak (2005)¹⁷⁾ cites one of four requirements for Malaysian land administration agencies to advance to World Class as Human Resources (HR). The government must therefore strengthen the existing social policy and human resource departments in the land offices, which place a priority on the attitudes and behaviors of public employees, if Malaysia is to be known for its world-class land administration delivery system.

3. Research Methodology

This study used a mixed-methods research design to increase the richness of data collection, acquire a deeper understanding of the specific topic, and explore the participants' life experiences from both social and psychological studies. Creswell and Plano Clark (2011)⁸⁾ stated in a social science study that "mixed methodology is the cornerstone of research that is experienced in everyday life."

3.1. Participant

The purpose of this article is to analyze the influence of self-efficacy on self-motivation in the land administration delivery system. According to Krejcie and Morgan (1970)²⁰⁾, when the population size (N) is approximately 700 participants, the minimum sample size (S) required is 248 participants. In the meantime, a qualitative research methodology was utilized to investigate the impact of individual self-efficacy on the self-motivation of public servants working in land

administration departments. In-depth interviews were conducted with thirty (30) respondents. All respondents are drawn from the district level. This article then presented all of the conclusions from the thematic analysis of interview data using grounded theory. Purposive sampling was used to select participants, who were recruited from public servants who are knowledgeable and acquainted with the land administration delivery system at land offices (Creswell, 2014⁷; Etikan, Musa & Alkassim, 2015)¹⁰. The table below describes the inclusion criteria for this mixed-methods study:

Table 1. Participants from the District Land Offices in Kedah

No	Inclusion Criteria	Description
1	Gender	Male and female
2	Age	20 to 60 years old
3	Land Department	District (PTD)
4	Educational Qualification	SPM, Diploma, Degree, Master and PhD
5	Duration of Service	Less than 1 year to more than 5 years of service

3.2. Procedure

The "invitation to participate" in the research was sent by official government email to each land administration office's Head of Department, and the participation was voluntary. The number of participants was determined based on their responses to the informed consent form, and they were then contacted by phone. Front-line employees were given priority to become part of the qualitative study because they had more exposure to deal with customers at the counters. The survey session was conducted online and answered through the Google Form link. On the other hand, the semi-structured interviews were performed face-to-face for 20-30 minutes at the participant's work. Given that this study included only Malays as subjects, the questionnaires were translated for both survey and interview questionnaires. The questionnaires were evaluated by eight (8) experts from various universities (all of them are lecturers or senior lecturers in psychology and social science) before the interview was carried out face-to-face.

3.2.1. Instrumentation and Analysis of Quantitative Data

The survey questionnaire is designed to assess employees' current levels of self-efficacy using a 5-likert scale, locus of control using a 6-likert scale, motivation using a 6-likert scale, and job performance using a 6-likert scale. A Likert scale's points are frequently labeled as (1-Strongly Disagree to 5-Strongly Agree) (Creswell, 2014)⁷. Then, in motivation questionnaires, there will be 15 options for answers, with participants required to select only three (3) of them. In this study, the Statistical Package for the Social Sciences (SPSS) is used for data management and analysis. The results of the

questionnaire were entered into the SPSS program for further analysis. Descriptive statistics such as mean, median, and standard deviation are used to generate a broad summary of the survey data (Creswell, 2014)⁷.

3.2.2. Instrumentation and Analysis of Qualitative Data

In-depth semi-structured interviews were used in this qualitative study Creswell (2014)⁷. The questionnaires included open-ended questions as well as some semi-structured questions, and there were three (3) sections. The motivation questionnaires were adapted from a previous study conducted by Nguyen (2017)²⁷. The questionnaires comprised seven (7) questions, and participants were encouraged to provide responses based on their own experiences. Following the interviews with the participants, the data was analyzed using template analysis. Template analysis is a method for organizing and evaluating qualitative data thematically (Brooks & King, 2012)³. This form of analysis is utilized in research to find the underlying reasons for human behavior and specific human events. Aside from that, the use of template analysis is shown in the form of codes, as well as the emergence of themes and sub-themes throughout the study. The pattern of repeated codes during the interview was then analyzed and classified as a sub-theme or theme. The NVivo 12 Plus software was used in order to precisely transcribe and analyze all of the recorded interviews.

4. Result

4.1. Quantitative Data Finding

This study employed two data collection and analysis methods. This part addressed all of the investigation's findings and data elaboration. The descriptive statistics on self-efficacy and motivation level among land administration departments are shown in Tables 2 and 3.

Table 2. Descriptive Statistic of Self-Efficacy' Level

Level		Frequency (N)	Per Cent (%)	Mean	Standard Deviation
Overall participants	High	235	94.8 %	3.28	0.50
	Low	13	5.2 %		

Table 2 demonstrates the level of self-efficacy among the employees in land administration departments. The table indicates frequency (N), percentage (%), mean, and standard deviation. Levels were categorized as low (scores of 1.00 to 2.50) and high (scores of 2.51 to 4.00). In accordance with the overall descriptive analysis, the majority of participants demonstrated a high level of self-efficacy since the frequency of participants was recorded as the highest in "high" (N = 235, 94.8%) with an overall mean of 3.28 (range = 2.51 to 4.00). From the findings, there is a major gap where 94.8% of participants in the survey indicate a high level of self-efficacy and only 5.2% indicate a low level of self-efficacy.

Table 3. Descriptive Statistic of Motivation' Level

Level		Frequency (N)	Per Cent (%)	Mean	Standard Deviation
Overall participants	High	219	88.3%	4.51	0.90
	Low	29	11.7%		

Table 3 demonstrates the level of motivation among the employees in land administration departments. The table indicates frequency (N), percentage (%), mean, and standard deviation. Levels were categorized as low (scores of 1.00 to 3.50) and high (scores of 3.51 to 6.00). In accordance with the overall descriptive analysis, the majority of participants demonstrated a high level of motivation since the frequency of participants was recorded as the highest in "high" (N = 219, 88.3%) with an overall mean of 4.51 (range = 3.51 to 6.00). Likewise, it shows that the majority of participants have a high level of motivation (88.3%), and only 11.7% demonstrate a low level of motivation.

4.2. Qualitative Data Finding

The first step in analyzing the qualitative data is transcribing all the interview results. Then, the data were analyzed using the Nvivo 12 Plus to obtain the pattern or code that emerged during the interviews.

Table 4 indicates two main themes: "Factors affecting motivation positively" and "Factors affecting motivation negatively." In addition to the main theme, the findings were broken down into two sub-themes, "motivate" and "demotivate," and ultimately, a few codes—common expressions used frequently throughout the interview session—emerged. The order of the codes is determined by how frequently the terms are used; the higher the code, the more frequently the term is used. The information gleaned from the interview was first and foremost transcribed. Then, applying "thematic analysis" techniques, themes were identified based on the most frequent code (Brooks & King, 2012)⁴. The sub-theme and theme were established by grouping and categorizing the codes. The most frequent comments, both positive and negative, addressing the subject of participant motivation were noted throughout the interview session. The "motivate" sub-theme developed from positive feedback. Conversely, feedback was labelled "demotivate" when the participant expressed negative feedback. During the session, each participant's point of view was different. Since this was their first time participating in an interview pertaining to how they felt about the workplace environment and service delivery qualities, the majority of participants were enthusiastic about answering all of the questionnaires, as evidenced by their facial expressions and body language during the session. Before the interview, respondents were given the option to ask questions about any terminology or concepts that they were unfamiliar with or found difficult to comprehend. Participants who did not feel comfortable answering were given the option to withdraw and not complete the questions. The questionnaires were first revised by experts from numerous Malaysian universities before the session. The expert's reviews were taken into

account, and the questions were modified in response to the comments in order to improve the validity and reliability of the questionnaires. The reviews revealed that the experts agreed with the questionnaires developed by the author, and the surveys encouraged participants to submit responses or feedback in tandem with the research objectives.

Table 4. The Analysis of Qualitative Data

<i>Theme</i>	<i>Sub-theme</i>	<i>Codes</i>
Factors affecting motivation positively	Motivative	a) Leaders b) Knowledge c) Co-workers d) Family e) Work quality f) Responsibility g) Workplace environment h) Salary i) Trust j) Confidence k) Optimism l) Enthusiasm
Factors affecting motivation negatively	Demotivate	a) Leaders b) Customers c) Difficulty d) Seniority e) Workload f) Misconduct g) Procedure

5. Discussion

5.1. Extrinsic and Intrinsic Motivation

First and foremost, the findings were divided into two categories: extrinsic and intrinsic motivation. Extrinsic motivation in Table 4 is defined as "leaders, colleagues, family, workplace environment, salary." In contrast, intrinsic motivation refers to "knowledge, responsibility, trust, confidence, optimism, enthusiasm". Similar to the data gathered from the respondents, (Ritz, Neumann & Vandenabeele, 2016)³⁰⁾ stated that the core of intrinsic motivation is desirable employee outcomes like performance and commitment. Contrarily, extrinsic motivation refers to rewards for work efforts that are intangible or immaterial (such as money or bonuses) or social status and prestige. This study shows that extrinsic rewards are provided to employees to boost motivation and performance. Extrinsic motivation can come from positive public feedback or from department heads, as well as positive social support from work colleagues, family, and friends. Extrinsic motivation, meanwhile, also describes the monthly pay received by public employees, along with the annual bonuses given out during the festive season and yearly raises. Intrinsic motivation, on the other hand, may refer to knowledge, responsibility, trust among work colleagues, confidence, optimism, and enthusiasm to provide efficient and effective service delivery. Each person's motivation has a unique focus or orientation, regardless of the source of motivation (extrinsic or intrinsic motivation) (Van der Kolk, Van Veen-Dirks & TerBogt, 2018)³⁴⁾. By recognizing the sources of motivation, studies considered how employees social backgrounds affect those sources.

5.2. Motivator and Hygiene Factors

In addition to these two types of motivation, extrinsic and intrinsic, the codes in Table 4 also identified Herzberg's hygiene-motivation factors. To begin, the Motivator factors are "knowledge, responsibility, trust, confidence, optimism, enthusiasm". Meanwhile, the Hygiene factors are as follows; "leaders, colleagues, family, workplace environment, salary, customers, seniority." Additionally, Herzberg believed that once all hygiene standards were met, employers should focus on celebrating the accomplishments of their employees and providing them with opportunities to advance their careers (Ganta ,2014)¹³⁾. The government must therefore concentrate on employee hygiene issues in order to support their professional growth and contribution to overall happiness. Motivator factors are important, but hygiene factors contribute to job satisfaction and achieve maximum job performance among public servants. Hygiene factors can contribute to creating a healthy workplace environment. According to the categorization of the findings, hygiene refers to extrinsic motivation, which derives from an external drive for motivation. On the contrary, the motivators were mostly derived from intrinsic motivation or internal motivation. According to a previous study by Kaur and Sharma (2022)¹⁸⁾, several public sector organizations are progressively using Herzberg's theory to increase possibilities for personal growth, improvement, and appreciation among employees. Furthermore, everyone has distinct motivators, and this study sheds new light on those of public employees who work in land administration offices. Additional motivators are required in the land administration system for land officers to perform more effectively and efficiently in order to deliver services to the general public and other stakeholders. The recurring codes that surfaced throughout the interview session show a substantial correlation between the internal and external sources of motivation and the ability to increase individual motivation among the staff in land administration departments. Interestingly, the overall findings prove that all the respondents have different ways or reasons to be motivated and demotivated. According to the statement verified by Chai et al (2017)⁵⁾, employees may have varying sources of motivation, and the motivational elements may have different effects on different people.

5.3 The Influence of Self-Efficacy on Motivation

According to the overall quantitative results, the majority of participants had a high level of self-efficacy and motivation. The relationship between the two concepts is that employee self-motivation increases in direct proportion to self-efficacy levels. Employee self-motivation is related to one's level of self-efficacy. Similarly, Flammer (2004)¹²⁾ discovered that employees with high levels of self-efficacy have higher levels of self-esteem. Self-esteem is another term for motivation. Employees with high self-esteem are more motivated to execute their tasks successfully. In the meantime, employees with high self-efficacy are quick to master new skills and persevere in the face of failures, setbacks, and impediments. Employees with high levels of self-efficacy are more likely to tolerate stressful situations and perform well under pressure. These excellent traits are essential in the public sector since they represent the image of the government, and the quality of services is a predictor of job performance. Low self-efficacy, on the other hand, is characterized by a tendency to feel helpless, become depressed, passive, and anxious, avoid uphill battles, give up easily when faced with difficulties, set fewer goals, and demonstrate a lack of commitment, according to Kesumawatie, Sumaryono, and Herdijanto (2021)¹⁹⁾. These unfavorable characteristics of employees jeopardize the public sector's reputation and service quality. According to the data analysis, the survey results revealed general findings about self-efficacy and motivation level. The next section goes deeper into the motivating explanations through the utilization of qualitative data.

5.4. The Influence of Self-Efficacy and Motivation on 'Leadership'

According to the qualitative data, most respondents believe they are more motivated at work than they actually are, and very few report feeling demotivated. Interestingly, one code appears twice, indicating the top level or head of departments in the government sector. Given that leaders have an impact on employee motivation, the outcome emphasizes the vital role of leadership in land administration departments. A previous study by Said, Alam and Aziz (2015)³¹⁾ indicated that leaders in all public sectors are required to embrace the following characteristics: "conforming morals and values, highly ethical, honoring integrity, honest and trustworthy, visionary, full of respect, passionate, committed, compassionate, fair, kind, forgiving, courageous, loving, deep listening, inspired and inspiring, authentic, multidimensional, and amendable to change (p10). Leaders set an excellent example for employees when they demonstrate good qualities of leadership skills; otherwise, the emergence of leaders who lack leadership skills would demotivate and stress employees. Organizations can promote self-efficacy in the meantime by providing professional development and coaching, goal-setting, supportive leadership, and rewards for performance (Lunenburg 2011)²¹⁾. According Lunenburg (2011)²¹⁾ statement, supportive leadership is extremely meaningful and vital in increasing employee self-efficacy in land administration departments. The influence of leaders on improving self-efficacy among public servants can be explained by focusing on mastery experiences as the primary source of self-efficacy. Mastery experience is essential, especially when learning from leaders or senior colleagues with extensive land administration delivery system knowledge. Bearing this in mind, leaders can act as good role models for some people as they grow in their careers. Leaders may, in the interim, present a poor example for employees due to the stress placed on them and the problems with leadership. In land offices, mastery experience encompasses both the organization's accomplishments and the experience of senior colleagues or land officers. As a result, the influence of leadership on self-efficacy and motivation is significant, especially when supportive leadership is used to promote self-efficacy. In the public sector, being a supportive leader is critical for ensuring the efficacy and efficiency of service delivery. Another way to explain leadership through self-efficacy is through one of the self-efficacy sources, verbal

persuasion. The best way for a leader to use verbal persuasion is through the Pygmalion effect (Lunenburg, 2011)²¹⁾. The Pygmalion effect is a type of self-fulfilling prophecy in which believing something is true causes it to become true. The Pygmalion effect has also been applied in the workplace. According to studies, when leaders feel confident in their employees' ability to complete a task successfully, their employees perform better. After all, the Pygmalion effect exemplifies supportive leadership. Leaders who have confidence in their staff members will boost their employees' self-efficacy to perform at a high level. However, if leaders place too much workload and stress on employees, they may experience low self-efficacy and motivation to perform well at work.

5.5 The Influence of Self-Efficacy and Motivation on 'Customers'

Another noteworthy conclusion is that the vast majority of the participants feel demotivated by "customers," with the majority mentioning the word "problematic customers" while being labelled with the term "customers." Customers in land administration departments refer to many groups of society, such as customers from the general public, stakeholders, investors, lawyers, and other agencies. The customer's response is determined by their satisfaction with the services provided as well as the service quality. According to (Mohamad Zabri et al., 2016)²⁵⁾ customer satisfaction literature, numerous definitions of service quality center on accomplishing customer requirements. In terms of self-efficacy, public employees will be able to perform well and increase public trust in the government if they have confidence in every task, regardless of the challenges or barriers. This is similar to Lunenburg's (2011)²¹⁾ remark, in which self-efficacy is considered a type of self-confidence or a task-specific version of self-esteem. Aside from that, the physiological state of the employee is one of the sources of improving self-efficacy and further exploring the actions and attitudes of land officers (Bandura 1994)²⁾. Based on the outcomes of the interviews, the majority of participants, specifically those who work as "front-liners," indicated feelings of stress triggered by customers, which may hinder their motivation and performance on the job. Thus, public servants who have a high sense of self-efficacy are more capable of dealing with stressful events and challenges when dealing with customers. In the opinion of Fanggidae (2017)¹¹⁾ also stated that highly motivated employees are more likely to perform their responsibilities successfully and effectively. The primary driving force behind public services is government employees' desire to improve the common good. In land administration departments, public servants engage with the public at large on a daily basis. The staff of the government will be extremely motivated to carry out their duties when they are interested in serving the public (Iacob and Dermengi, 2022)¹⁶⁾. According to Bande et al. (2016)³⁾, defining responsibilities and offering social support can help enhance employee self-efficacy. Social support appears to play a crucial role. The social support of a family member or colleague, for example, could become a source of positive motivation. Without the social support of colleagues, family, and friends, employees in government might find it difficult to remain motivated at work and to deliver services. In terms of self-efficacy, social roles such as family, friends, and colleagues all play important roles in enhancing self-efficacy through vicarious experience. As previously said, it is critical for employees to have strong self-efficacy in order to be motivated at work and perform successfully.

6. Conclusion

In a nutshell, the outcomes of this study would be among the most important findings in the areas of psychosocial and land administration research. Employees' voices or viewpoints are critical in this article. The qualitative data is crucial for providing more information about the motivating elements. This is due to the fact that, even if a person has a high degree

of knowledge, if they lack drive and self-efficacy, they will not be able to perform successfully. After all, according to the conclusions of this study, the majority of public employees exhibit high self-efficacy and motivation. Land administrators with an advanced understanding of land law and policy are expected to function well, particularly in decision-making. The level of self-efficacy and motivation to succeed among land administrators increases with knowledge level. Job performance is crucial for ensuring organizational efficiency and effectiveness. Additionally, by identifying motivational factors using qualitative approaches, the head of department may arrange appropriate training and courses to improve self-efficacy and motivation among public employees. Furthermore, employee well-being is an important issue. Public servants are the backbone of the government. Public servants have a significant responsibility to provide quality services to the public. Department heads or, more explicitly, the government ought to offer additional motivators in order to increase public employees' motivation to strengthen their drive for their professions and strive to the best of their abilities. Meanwhile, understanding public servants through the four sources of self-efficacy (*mastery experience, vicarious experience, social persuasion, and psychological state*) offers new insight for the land administration research area to understand public servants' experiences in the land administration delivery system. In the future, this study could be expanded to include more psychological factors and cover more Malaysian land administration departments.

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ORIGINAL ARTICLE

Challenges of “Young Carer Support” in Japan and Role of Community-based Integrated Support Centers

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ABSTRACT

To clarify the challenges of young carer support among professionals engaged in community-based integrated care in the eastern area of Shizuoka Prefecture, Japan, as a basis for determining the role of community-based integrated support centers in such support. We conducted an open-ended web questionnaire survey, involving 87 professionals who had participated in a young carer support training seminar planned by a community-based integrated support center, and performed quantitative text analysis to identify the challenges of young carer support. Fifty-one professionals responded (response rate: 58.6%). The 5 most frequent words were led by “necessary” (32), followed by “collaboration” (27), “think” (26), “educational institution” (22), and “support” (17). Through co-occurrence network analysis, 4 network groups, <challenges in grasping young carers>, <challenges of the community>, <challenges related to support systems>, and <challenges related to collaboration>, were formed. The results indicated the necessity of organizing support systems that enable the identification of young carers through the establishment of laws and systems, and promoting collaboration between the community and health, medical, welfare, and education fields to support young carers in communities. Community-based integrated support centers are expected to play a pivotal role as a base for facilitating such collaboration.

Keywords: Japan, young carer support, challenge, community-based integrated support center, role

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1. Introduction

In Japan, the long-term care insurance system launched in 2000 has changed the perception of long-term care from something to be solved within the household to an issue to be addressed by society. With the revision of the Long-Term Care Insurance Act in 2005, community-based integrated support centers were established as consultation and support offices close to community residents, and various initiatives have been promoted to date to ensure that care receivers covered by long-term care insurance and their families can continue to live comfortably in their familiar communities. According to the Ministry of Health, Labour, and Welfare, as the community environment surrounding care receivers and family caregivers undergoes significant transformation, it has become an urgent issue to promote support measures and projects for family caregivers from a new perspective¹⁾. Community-based integrated support centers are expected to play a key role in this.

The Organization for Economic Cooperation and Development (OECD) reports that many developed countries are more advanced than Japan in terms of supporting family caregivers²⁾. The United Kingdom was the first country in the world to conduct a status survey involving young carers, who are often overlooked in society among family caregivers, after 1990, and the 2001 national census reported that the number of young carers in the UK was 175,000³⁾. Similar surveys, studies, and legislations have also been administered in other Western countries⁴⁾. On the other hand, in Japan, the overall status of young carers has not yet been determined, and the first survey to clarify the status of junior and senior high school students was conducted in 2020, followed by an elementary school and university student questionnaire survey in 2021⁵⁾. The results revealed that 4-6% of elementary school to university students were young carers, and the care receivers were their grandparents or parents. The frequency of care was most often daily, ranging from less than 1 hour to more than 8 hours. Furthermore, the most common answer when asked about support for young carers was “I don't know”, and there was a demand to nurture an environment that facilitates consultation, such as the provision of dedicated consultation services for young carers.

When searching for Japanese literatures on young carers without limiting the period, the topic appears in some articles only after 2018, except for a survey conducted in 2014 to assess welfare professionals' perceptions⁶⁾. However, the majority of these studies involved elementary, junior, and/or senior high school students or young carers themselves, and few targeted professionals in community-based integrated care. This literature review highlighted the necessity of collaborating with community residents and support institutions as a nursing role⁷⁾.

In the present study, we examined the challenges of young carer support, involving professionals engaged in community-based integrated care, who had participated in a young carer support training seminar in the eastern area of Shizuoka Prefecture, Japan. We also aimed to provide a basis for determining the role of community-based integrated support centers in such support. During the young carer support training seminar, some young carers spoke of their own experiences. The definition of young carers in this study was that provided by General Incorporated Association Carers Japan: children under the age of 18 who undertake caregiving responsibilities similar to those of adults when their family members require care, including household chores, caring for family members, caregiving, and emotional support⁸⁾.

2. Subjects and Methods

2.1. Study and Procedures

2.1.1. Study Design

We conducted an open-ended web questionnaire survey, and performed content analysis of the questionnaire results.

2.1.2. Study Period

From October 1 to November 30, 2022.

2.1.3. Subjects

The subjects were 87 professionals who had participated in a young carer support training seminar held as a function-enhancement project of Mishima Kita Community-based Integrated Support Center in FY2022. During the seminar, some young carers spoke of their experiences.

2.1.4. Study Items

As basic attributes of the subjects, we examined their sex, age, current job type, type of services provided by the current facility, and years of experience in the current job. We also conducted an open-ended survey on the provision of young carer support, details of support approaches, and challenges of such support.

2.1.5. Ethical Considerations

After obtaining consent from the organizer of the training seminar, we explained the voluntary nature of study cooperation and anonymity to participants of the seminar in writing and orally. We regarded submission of a completed questionnaire as consent. The study was approved by the Ethical Committee of the institution the researcher belongs to (approval number: 4-04).

2.2. Data Collection

We conducted a web questionnaire survey and collected responses using Google Form.

2.3. Data Analysis

We performed content analysis of free descriptions using KH Coder 3, text-mining software developed by Higuchi⁹⁾, focusing on challenges of young carer support. For the analysis, we prepared each respondent's answers as a single dataset. Next, based on the results of morphological analysis, we specified the following words as compound words to be extracted: "educational institution", "medical institution", "welfare institution", "child welfare committee member", "community-based integrated support center", "young carer", "young carer support", "care manager", "long-term care insurance office", and "school teacher". For text-mining analysis, we calculated the number of occurrences of each word, and performed co-occurrence network analysis. Based on these calculations, we created a list of the 50 most frequently used words. In the co-occurrence network analysis, we used sentences as the unit of aggregation, with the minimum number of occurrences set to 3 and the minimum number of documents set to 1. We focused on word-word co-occurrence relationships, and selected co-occurrence relationships based on the 50 highest Jaccard coefficients for analysis. It should be noted that co-

occurrence network analysis explores the relationships of word pairs based on similar occurrence patterns. Networks are visualized by connecting words with strong co-occurrence relationships using lines. In a co-occurrence network, the thickness of lines corresponds to the degree of co-occurrence relationships measured by the Jaccard coefficient, with thicker lines signifying stronger co-occurrence relationships. In addition, the size of the circles in the network is proportional to the number of occurrences of each word, with larger and darker circles representing more frequent words.

3. Results

3.1. Basic Attributes (Table 1)

Among the 87 participants of the training seminar, 51 responded (response rate: 58.6%). There were 44 (86.2%) females, 6 (11.8%) males, and 1 (2.0%) with no answer for sex. The average age was 51.2 ± 8.9 (29-67). There were 32 (62.7%) welfare, 8 (15.7%) medical, 3 (5.9%) health, 6 (11.8%) educational, and 2 (3.9%) other professionals. The most common type of services provided by the current facility was home care support services, with 21 (41.2%) respondents. The most common number of years of experience in the current job was more than 1 year but less than 5 years, with 17 (33.3%) respondents.

Table 1. Basic Attributes

Item	n	%
Sex		
Female	44	86.2
Male	6	11.8
N/A	1	2
Age a)	51.2±8.9 [29-67]	
Current job type		
Welfare professional	34	66.7
Medical professional	7	13.7
Health professional	6	11.7
Educational professional	3	5.9
Others	1	2.0
Type of services provided by the current facility		
Home care support services	21	41.2
Community-based integrated support center services	12	23.3
Administrative services	6	11.8
Social welfare council services	3	5.9
Educational institution services	3	5.9
Care services	2	3.9
Others	4	7.8
Years of experience in the current job		
Less than 1 year	3	5.9
More than 1 year but less than 5 years	17	33.3
More than 5 years but less than 10 years	15	29.4
More than 10 years	16	31.4

a) Mean ± SD [minimum - maximum]

3.2. Analyzed Words

The total number of words analyzed by text mining (total number of analyzed words) was 2,007, and the number of different words (number of word types) was 464. Note that these numbers do not include common words that are used in most sentences, such as particles and auxiliary verbs.

3.3. Word Frequency (Table 2)

Table 2 lists the 50 most frequently used words, led by “necessary” (32), followed by “collaboration”, “think”, “educational institution”, “support”, “oneself”, “feel”, “child”, “care”, and “community”. The number of occurrences ranged from 32-10 among the top 10, 9-4 among the top 11-32, and 3-2 among the top 33-50 words.

Table 2. Frequent Words (Top 50)

Rank	Extracted words	Number of occurrences	Rank	Extracted words	Number of occurrences
1	necessary	32	25	care manager	4
2	collaboration	27		school teacher	4
3	think	26		training	4
4	educational institution	22		important	4
5	support	17		disability	4
6	oneself	12		many	4
7	feel	11		welfare	4
	child	11	33	assistance	3
9	care	10		counselor	3
	community	10		awareness	3
11	related	9		medical care	3
12	child welfare committee member	8		medical institution	3
	system	8		share	3
14	family	7		personal	3
	school	7		inform	3
	institution	7		situation	3
	difficult	7		close	3
	welfare institution	7		voice	3
19	administration	6		the person him/herself	3
20	information	5		transmit	3
	consultation	5		field	3
	community-based integrated				
	support center	5		health	3
	grasp	5		understanding	3
	problem	5	49	case	2
25	help	4		caregiving	2

3.4. Co-occurrence Networks (Figure 1)

There were 4 co-occurrence network groups, representing <challenges in grasping young carers> (Figure 1), <challenges of the community> (Figure 2), <challenges related to support systems> (Figure 3), and <challenges related to collaboration> (Figure 4). These network groups were formed based on the descriptions in the questionnaire, which contained words constituting these networks.

The network group <challenges in grasping young carers> (Figure 1) consisted mainly of the following words: “*child welfare committee member*”, “*community-based integrated support center*”, “*grasp*”, “*care manager*”, “*information*”, “*personal*”, “*school teacher*”, “*close*”, “*training*”, and “*counselor*”. Descriptions containing these words (*in italics*) included: “Young carers may not tell the truth, so it is necessary for *counselors*, class teachers, and *child welfare committee members* to collaborate”, “We need to make young carers aware of the presence of *community-based integrated support centers* and *care managers*”, “We have to *grasp* the actual situation”, “We have to make *school teachers* and community residents *close* to young carers notice their situation”, “Holding *training seminars* through *collaboration* among *community-based integrated support centers*, *school teachers*, and *care managers* may be helpful”, and “The *child welfare committee members* always complain that there are barriers related to *personal information*”.

The network group <challenges of the community> (Figure 2) consisted mainly of the following words: “*care*”, “*community*”, “*the person him/herself*”, “*voice*”, “*school*”, “*awareness*”, “*share*”, “*disability*”, and “*inform*”. Descriptions containing these words (*in italics*) included: “It is necessary to create a *community* that does not see children as manpower for care”, “This should be considered a *community* issue”, “I think that the *voice* of *the person him/herself* is very important”, “It is necessary for the child welfare committee member, *school*, residents’ association, and children’s association to collaborate and inform the parties concerned of the situation”, “Consultation and support offices that comprehensively support *care*, parenting, people with *disabilities*, and mental health are required in the *community*”, and “We have to encourage young carers to *share* their thoughts about continuing to provide *care*”.

The network group <challenges related to support systems> (Figure 3) consisted mainly of the following words: “*child*”, “*system*”, “*support*”, “*medical institution*”, “*field*”, and “*understanding*”. Descriptions containing these words (*in italics*) included: “I don’t know how we can understand and empathize with the thoughts of *children*”, “We have to build appropriate *support systems* surrounding *children*”, “*Support systems* across *fields*, covering disabilities, children, and *medical institutions*, are required”, and “It is difficult to address this issue without mutual *understanding* of other fields among professionals”.

The network group <challenges related to collaboration> (Figure 4) consisted mainly of the following words: “*necessary*”, “*collaboration*”, “*think*”, “*educational institution*”, “*support*”, “*welfare institution*”, “*administration*”, “*related*”, and “*institution*”. Descriptions containing these words (*in italics*) included: “Collaboration with *educational institutions* is essential”, “*Collaboration* between *educational institutions* and *welfare institutions* is difficult”, “There are many *institutions* requiring *collaboration*, including *administration*, *welfare institutions*, and *educational institutions*”, and “It is necessary for *related institutions* to provide support through *collaboration*”.

In addition, as frequent words, “necessary”, “collaboration”, “think”, “educational institution”, “welfare institution”, “support”, “feel”, “child”, “care”, and “community” were drawn. As words with stronger co-occurrence relationships, “collaboration” and “educational institution”, “support” and “system”, “close”, “school teacher”, and “training”, and “personal” and “information” were drawn with thicker lines.

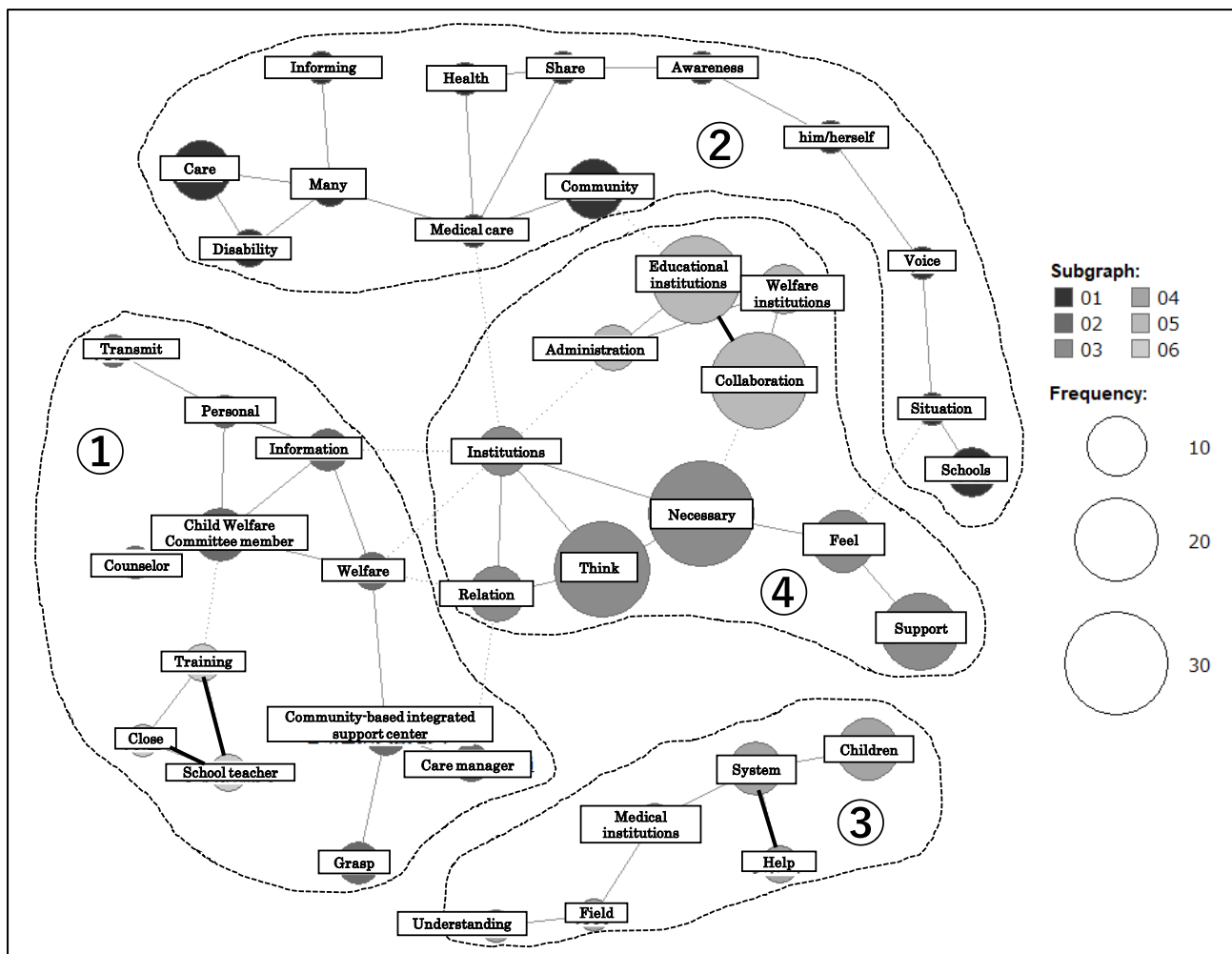


Fig1. Co-occurrence network of young carer support issues (Top50)

4. Discussion

The professionals engaged in community-based integrated care in the eastern area of Shizuoka Prefecture, Japan, described 4 categories of challenges in terms of young carer support: <challenges in grasping young carers>, <challenges of the community>, <challenges related to support systems>, and <challenges related to collaboration>.

First, concerning <challenges in grasping young carers>, conceptual analysis of young carers in Japan showed that these children have [overburdened roles and responsibilities] to carry out [various care tasks], in addition to caregiving, including housework, money management, and language interpretation, and they also make [efforts to maintain the household] to protect other family members from being forgotten. On the other hand, while developing [complex emotions], such as the desire to escape from reality and a feeling of guilt for having such a desire, they also increase their [unawareness of the situation] without anyone noticing¹⁰⁾. These characteristic attributes of young carers make it difficult to grasp them. In the present study, some respondents of the questionnaire described the necessity for “child welfare committee members”, in addition to “community-based integrated support centers” and “care managers” from the welfare field and “school teachers” and “counselors” from the educational field, to grasp young carers. A previous survey involving school counselors indicated the necessity of improving methods to identify young carers using various social resources, as well as through schools¹¹⁾.

It is also important that community-based integrated support centers and child welfare committee members be recognized as social resources for the identification of young carers. Also, as strong co-occurrence relationships were observed among the words “close”, “school teacher”, and training” in the present study, young carer support requires opportunities for learning in a familiar environment. In this respect, holding training seminars on young carer support may be expected of community-based integrated support centers.

With regard to <challenges of the community>, one of the respondents stated that the problem of young carers should be considered as a community issue. As a community issue, some researchers noted that the preceding requirements for the conceptual analysis of young carers are influenced by the premise of Japan’s [community care policy], and that there are [family systems and dynamics] that produce young carers¹²⁾. Another survey on the role of psychiatric social workers reported that the problem of young carers requires an approach that considers not only the child him/herself, but also the whole family¹³⁾. In our previous study, family systems and relationships were also identified as a [whole family issue] in family caregiver support¹⁴⁾. However, in the present study, there was a strong co-occurrence relationship between the words “personal” and “information”, and barriers to “personal information” were noted. It is also undeniable that there is a sense of resistance to interventions for family issues, according to a general public awareness survey¹⁵⁾. As a clue to resolving <challenges of the community> in young carer support, a contact point that can provide comprehensive support across fields is needed, and community-based integrated support centers may be able to function as such a contact point.

As for <challenges related to support systems>, we would also like to emphasize the need for laws and systems to build cross-field support systems like those described for <challenges of the community>. Various other countries have established systems to support young carers. For example, the UK government enacted the Children and Families Act in 2014, allocating a section of Article 96 for young carers to specify their right to support. This act also obliges local authorities to assess the needs of young carers in communities¹⁶⁾, which simultaneously allows these authorities to reach out to children suspected to be young carers. A similar legal framework is also desired in Japan, where community-based integrated support centers can play a leading role in conducting such assessments. The results of analysis in the present study also revealed a strong co-occurrence relationship between the words “support” and “system”, suggesting that establishing support systems is an urgent task in young carer support.

Lastly, regarding <challenges related to collaboration>, some respondents of the questionnaire stated that collaboration between health, medical, and welfare institutions and educational institutions is difficult, but essential. In particular, the strong co-occurrence relationship between the words “collaboration” and “educational institutions” highlights the necessity of collaboration between educational and other fields. The Manual for Young Carer Support through Multi-institutional and Interprofessional Collaboration, created by the Ministry of Health, Labour, and Welfare, also illustrates the need for collaboration among educational, elderly welfare, child welfare, disability welfare, medical, and other health/welfare fields, with a focus on young carers and their families¹⁷⁾. In addition, a previous study on collaboration among supporters for comprehensive carer support has been reported [information aggregation (formal and informal)] and [role division and common understanding] as factors that promote collaboration¹⁸⁾. Thus, community-based integrated support centers are also expected to fulfill their role as a hub for information summaries related to formal and informal young carer support and for the role as division and common understanding in collaboration among related institutions.

In short, the results of the present study indicated the necessity of organizing support systems that enable the identification of young carers through the establishment of laws and systems, and promoting collaboration between the

community and health, medical, welfare, and education fields to support young carers in communities. Community-based integrated support centers are expected to play a pivotal role as a base for facilitating such collaboration.

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ORIGINAL ARTICLE

A Critical Discourse Analysis of Feminism in Drama: Susan Glaspell and Alice Childress as a Case Study

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ABSTRACT

This study is a critical discourse analysis of two feminist plays: *The Verge* by Susan Glaspell (1921) and *The Wedding Band: A Love/Hate Story in Black and White* by Alice Childress (1966) dealing with the representation of feminism of the heroines of the two plays. Many studies have dealt with critical discourse analysis of feminism in different literary genres, however, plays have been given less attention in this respect. This study shows the role of feminism in two different societies; it also tries to highlight the problems that women face at the time of the World War I in America, the thoughts and beliefs that society has against women and how women fight to break these traditions throughout these selected plays. Accordingly, the study hypothesizes that society and social traditions have an important role in the lives of women in the sense that both black and white women face different kinds of oppression. The model adopted for analysis is Fairclough's model (1989) and the data are analyzed qualitatively and quantitatively leading to the most important conclusions revealing that oppression is used against both black and white women and that women though of different societies face oppressions and undergo outdated social traditions; however, women differ in their way to break these traditions.

Keywords: Critical Discourse Analysis, black and white feminism, Fairclough's approach

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1. Introduction

The Throughout history, women take a social part which is secondary and subordinate to the part of men. This belief can be seen through the ways women are used to speak, behave and even the way people talk about them. Many studies have dealt with critical discourse analysis of feminism in different literary genres, however, plays have been given less attention in this respect. Many literary genres have been analyzed in different fields like in novels, short stories and poetry. However, this study tries to full and bridge the gap between critical discourse analysis and plays.

Women's roles dramatically expanded during the World War I as many took over traditionally male jobs while men were away fighting. This sparked new debates around women's place in society.

The selected plays are attempted to show the problems that women face at the time of World War I in America, the thoughts and beliefs that society have against women and how women fight to break these traditions. The study aims at: Identifying the textual and discursive strategies in the plays under study; finding out the social strategies used in revealing feminism and other aspects in the plays under study, showing the similarities and differences in the plays under investigation. It is hypothesized, accordingly that grammar is highly utilized as a textual strategy in the plays under study; in terms of the discursive strategies, intertextuality is more used than other elements in the two plays; freedom is the most dominant social strategy used to convey the playwright's ideologies in the plays.

This study is limited to a critical discourse analysis of feminism aspects which are presented in two plays *The Verge* (1921) by Susan Glaspell and *The Wedding Band: A Love/Hate Story in Black and White* (1966) by Alice Childress which are from different societies and cultures. The texts are selected to be analyzed by using Fairclough's three levels model (1989) description, interpretation and explanation. Both "The Verge" by Susan Glaspell and "The Wedding Band" by Alice Childress offer valuable insights into the representation of feminism through their heroines. Despite being written in different eras, both plays tackle significant feminist themes and portray strong female characters facing challenges within the social and cultural contexts of their time.

2. Literature Review

2.1. Critical Discourse Analysis (CDA)

CDA starts with the assumption that language use is always social and that discourse both 'reflects and constructs the social world¹⁾. CDA studies examine issues such as gender, race, cultural differences, philosophy and identity, and how texts both create and represent them. It also discusses ways in which language builds and is shaped by social relationships. A critical analysis can involve a comprehensive textual analysis and transfer to a description and interpretation from there²⁾. See also³⁻⁵⁾.

There is a connection between gender, sex, sexuality and CDA. The founders and scholars of CDA who combined the movement and development with its many appearances have been conscious of work on gender in sociolinguistics and other associated fields, together with discourse analysis (DA). Working in sociolinguistics and DA normally focuses on the work and behavior of speech of male and female on the styles of conversation in communications between male and female. Concerning the work of descriptive sociolinguistics, gender is regarded as another class to classify individuals and groups together with class, race/ethnicity, socioeconomic status, educational background, religion, etc., all of which also proclaim for, and some are advanced by critical work⁶⁾.

2.2. Feminism

The Feminism is an important term and one of the recent beliefs to appear which tries to analyze the situation of women in society, show their obvious part in history and suggest the foundation for improvement and the development of women in parts of society. Feminists have believed that there is a central power fight between women and men, similar to the struggles about race and class which is possibly radical. Actually, this is the most ancient power struggle, the minimum forms of struggle, the greatest essential forms in its suggestions for society. Mary Wollstonecraft is a main early feminist writer who has claimed that the legal rights should be the same for women and men on the areas of equal humanity, rationality and freedom, and moral value. It is a wrong belief that women must be known by their sex which leads to ignore their educational, legal, economic and political rights. As soon as equality was recognized there would be a positive revolution in the relation between women and men⁷⁾.

2.3. *The Verge (1921)*

The writer of *the Verge* is *Susan Keating Glaspell* (1876 –1948), an American, is the most important woman and playwright of her time. The most consistent theme in her writings is the drive of her central character to escape the structures holding them in place; their direction is habitually toward some ill-defined but freer “outside” that has yet to be discovered. Glaspell is one of the first American playwrights, female or male, to use expressionistic techniques that she had learned in Paris, like in *The Verge* (1921), which is about a woman who tries to create or breed a new kind of plant life, “just as she wishes to create a new pattern as an independent woman,”⁸⁾. Glaspell presents tragic characters, who however untraditionally stay alive till the end, and at the same time still great victims and sufferers. The She-tragic heroines of Glaspell are encouraged to act because of the intolerable circumstances they face in their patriarchal society. Restricted, confined, controlled and oppressed by the male-controlled system, they suffer deep and strong psychological pressure, and react violently. In spite of their violent reactions, Glaspell’s protagonists are not naturally and innately criminals. What pushes them to kill is their frustration and sense of entrapment. Their efforts to break free from their cage-like domestic restraints only lead them to other forms of imprisonment— the mental asylum and the institutional prison⁹⁾.

2.4. *The Wedding Band: A Love/ Hate Story in Black and White (1966)*

There The writer of this play is *Alice Childress* (1916 –1994), an African-American playwright, actress, novelist, short story writer, journalist, essayist stretches and director. She is the only African American woman who has written, produced, and published plays for four decades. In her work, she presents themes about slavery, racial discrimination, and the history of her family^{10,23)}.

In *the Wedding Band*, Alice Childress presents her black and white Romeo and Juliet who are the modern victims in their society. Alice in this play confirms that racism is not only practiced by whites against blacks but also by blacks against whites. she presents an image of angry women united by their suffering and need of sisterly unity and solidarity. The anger of those women is a positive rather than negative factor as it gives the heroine her freedom from the ties that make her an outcast in her own community. This play argues the destiny of two lovers who face refusal from their families and society and the following anger of the female characters whether in favor or against this romantic relation¹¹⁾.

2.5. Related Studies and the Current Study

In the field of feminism and CDA, there are some researches that handle some kinds of genres rather than plays like O'Donnell's (2013)¹²⁾. She adapts Huckin's analytical tool for contrastive analysis of the texts of the two films. The aims of this study are to show how U.S. social discourses are characterized through film and media, how morality has become assigned to, and they have taken a critical part to ease the damage on cultural and personal identity for women and minorities. The main conclusion of this study is that social and culture messages can be presented through films; both films display the culture of the U.S. by representing main ideologies and discourses.

A PhD dissertation by Faeq (2015)¹³⁾ *A critical discourse analysis of feminist language in English and Arabic Novels: A contrastive study* is another related study that compares feminism in two novels. The problem of this study is to investigate feminist novel-writing in English and Arabic languages by exploring what exact linguistic features might characterize each; and the ideologies imbued within feminist language. The study tries to show how women's treatment and roles might converge or diverge in the two different cultures. The model of analysis is Fairclough's and the study concludes that the two novels show universal features concerning women in that both cultures are dominated by the dominant-muted / center-periphery patterns and that male violence against women is one of the most visible outcomes of gender inequality and women's lack of empowerment.

The present study deals with two plays in different societies with the same temporal period (World War 1), each writer shows how the society deals with women and control their role. In the two plays the main characters fight with society that makes them more powerful than any time.

3. Methodology

A qualitative and quantitative analysis are meant to be used in this study. The qualitative analysis is used to understand how the language of the play is manipulated to achieve the themes and to analyze human behaviors and feelings. The quantitative analysis is used to show the results and findings that the research aims at and are represented in the form of tables and figures.

3.1. The Model Adopted

To accomplish this study, Fairclough's model (1989) is adopted. This model serves to investigate the hidden ideologies like racism and other aspects in relation to feminism to fulfill the ultimate aim of this research. This model includes three linguistic levels: Description (Quirk et al (1985) is adopted in this level), Interpretation, and Explanation.

3.1.1. Description (Textual Analysis)

Vocabulary (types of nouns and adjectives), Grammar (transitivity, types of sentences, modality) and Text Structure (turn taking, sentence length) are the most important aspects that are dealt with here.

3.1.1.1. Types of Nouns

Overwording, Rewording, Euphemism, Synonymy, Antonymy, Metaphor, Informal language.

3.1.1.2. *Types of Adjectives*

Descriptive Adjectives, Possessive Adjective, Indefinite Adjective, Compound Adjective.

3.1.1.3. *Transitivity*

According to Halliday & Matthiessen¹⁴⁾, there are six process types which are divided into two groups, principal and subsidiary. Material, mental, and relational are related to the principal processes, while the behavioral, verbal, and existential are related to subsidiary group. Transitivity looks at who or what is represented as the actor/agent, and this sheds light on how power and agency are linguistically framed.

3.1.1.4. *Sentence Types*

Declarative, Interrogative, Imperative, and Exclamatory.

3.1.1.5. *Modality*

Quirk et al¹⁵⁾ present modality as “the manner in which the meaning of a clause is capable so as to reflect the speaker's judgment of the likelihood of the proposition it expresses being true”. Modality is stated by modal auxiliary verbs like can, could, may, might, must, ought, should, and also by various other formal features representing by adverbs and tense to achieve the functions of 'permission', 'volition', 'obligation', 'possibility', 'prediction', and 'necessity'.

3.1.1.6. *Turn Taking*

Turn-taking is an important aspect of conversational analysis and the set of practices through which conversation is prepared. Mechanisms of turn -taking may vary between cultures or languages. Turn-taking in English-speaking societies usually means that in a conversation only one member speaks at a time. The first speaker (A) speaks and stops, the next speaker (B) speaks and stops, so, there is conversational patterns which look like: A-B-A-B-A-B¹⁶⁾.

3.1.1.7. *Sentence Length and Complexity*

Sentence length can be defined as the number of words that come between the opening word which starts with a capital letter and the end punctuation mark like: question mark, full stop, or exclamation mark¹⁷⁾. Sentence length and complexity can reflect many merits about the character's personality (simple or complicated) in addition it may lead to the structure of action rising and falling¹⁸⁾.

3.1.2. *Interpretation (Discursive Practice)*

3.1.2.1. *Intertextuality*

De Beaugrande and Dressler¹⁹⁾ define intertextuality as “the ways in which the production and reception of a given text depend upon the participants' knowledge of other texts”. Intertextuality is basically “the property texts have of being full of snatches of other texts, which may be explicitly demarcated or merged in, and which the text may assimilate, contradict, ironically echo, and so forth”²⁰⁾. The idea of intertextuality points to the productivity of texts, to how texts can transform prior texts and restructure existing conventions (genres, discourses) to generate new ones, but this productivity is not in practice available to people as a limitless space for textual innovation and play: it is socially limited and

constrained, and conditional upon relations of power (ibid).

Concerning the main functions of intertextual analysis within CDA, they are two: It shows a significant role in revealing speakers' and writers' strategies in re-formulating or reinforcing ideas and beliefs; and it can reveal traces of the main ideology or evidence of ideological struggle and cultural change²¹⁾. Intertextuality can be represented through Direct quotation; Indirect quotation; mentioning of a person, document, or statements, comment or evaluation on a statement, text; or otherwise invoked voice: like: judgment on curricula. It also can be achieved via identifiable phrasing, terminology related to particular people or groups of people or particular documents; or using language and forms that appear to rebound definite ways of communicating, discussions among other people, and kinds of documents²²⁾.

3.1.3. Explanation (Social Analysis)

In this level of analysis, many aspects will be discussed, feminism, freedom, identity, violence and racism in the two plays, and that will be achieved depending on the two previous levels: the textual analysis and discursive analysis. Below is the mental representation of analysis according to Fairclough's Model (Fairclough, 1989).

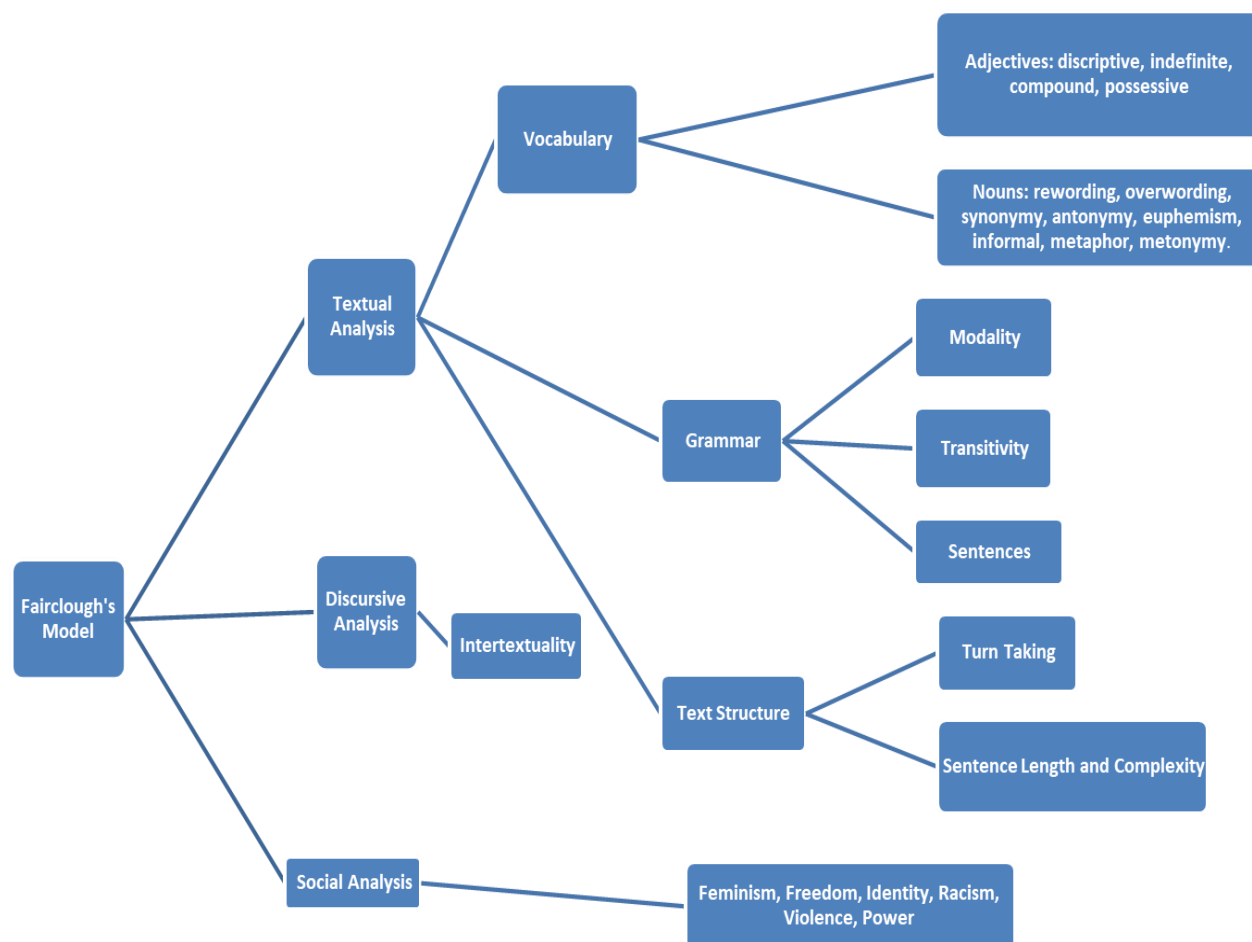


Fig 1. The Model of Analysis following Fairclough (1989)

3.2. A Sample of Analysis

Sixteen texts are selected to be analyzed according to Fairclough's model, eight texts from each play. The following is a sample of analysis from *The Verge*.

“CLAIRE: No; you never mean to do that. I want to break it up! I tell you, I want to break it up! If it were all in pieces, we'd be (a little laugh) shocked to aliveness (to DICK)—wouldn't we? There would be strange new comings together—mad new comings together, and we would know what it is to be born, and then we might know—that we are. Smash it. (her hand is near an egg) As you'd smash an egg. (she pushes the egg over the edge of the table and leans over and looks, as over a precipice)”. (p. 20)

This conversation is between Claire (heroine) and Harry (husband); Dick is in the same place but stay silent. This conversation occurs in in the greenhouse at morning. Claire tells them that she wants to get away from them, she wants to break the traditional rules. Claire is unable to fit in the normative gender roles of American society and protests upon all old values which look like a prison.

3.2.1. Description (Textual Analysis)

1-The Vocabulary Level

a- Adjectives

Table 1. Types of Adjectives

Descriptive	Possessive	Indefinite	Compound
Strange, new, mad			

Claire uses three descriptive adjectives in this text to describe the whole situation. So, it is clear that this text is descriptive.

b- Nouns

Table 2. Types of Nouns

Overlexicalization	Rewording	Synonymy
-There would be strange new comings together—mad new comings together, and we would know what it is to be born, and then we might know—that we are.	I want to break it up (2). Smash (2).	-There would be strange new comings together—mad new comings together, and we would know what it is to be born, and then we might know—that we are. - break up & smash.

Overlexicalization: Glaspell uses these expressions to talk about the traditional life and rules. She says that by destroying these rules, new things that are made and change will be achieved, and even human will be born again.

Rewording: the repetition is used here to reveal her inner conflict against everything. Claire uses clear words that show

her struggle and rebellion.

Synonymy: different uses of synonyms appear here; Claire refers to the new thing which will be born after smashing the rules. She uses these words and adjectives to describe the new expected life.

3.2.2. Description (*The Textual Analysis*)

1-The Grammar level

a-Transitivity Analysis

Table 3. Types of Verbs

Dynamic verbs	Stative verbs
	Thoughts and Opinions
break up, tell, smash, born.	Mean, want, know.

In this text different verbs are used, ranging from dynamic to stative verbs. Through her speech, Claire uses dynamic verbs to refer to herself. But when she refers to others she uses stative verbs. This is not a random use, she tries to express herself and how she has the energy and desire to do change. Her use of static verbs is to show the other's inability to change.

Sentence 1: I want to break it up.

Sentence 2: If it were all in pieces, we'd be shocked to aliveness

Sentence 3: we would know what it is to be born, and then we might know—that we are.

Sentence 4: Smash it.

Table 4. Transitivity System

Number of sentence	Actor	Process	Circumstance	Goal	receiver	identified	Identifier
1	I		to break up	It			
2		Were	all in pieces	It			
	We	Would be shocked	aliveness				
3	We	Would know	to be born	we are			
	We	Might know					
4		Smash		It			

b- Sentence Type

Table 5. Types of Sentences

Declarative	Interrogative	Imperative
I want to break it up. I tell you, I want to break it up. There would be strange new comings together—mad new comings together, and we would know what it is to be born, and then we might know—that we are	If it were all in pieces, we'd be (a little laugh) shocked to aliveness (to DICK)—wouldn't we?	Smash it

Claire uses declarative sentences because she thinks that she knows what she does. She uses an imperative sentence in the form of yes/no question. This usage shows that although Claire wants to change but she still has questions, as she is unsure about her decision.

c-Modality

Table 6. Types of Modal Verbs

The modal verb	The sentence
Would	-If it were all in pieces, we'd be (a little laugh) shocked to aliveness (to DICK)—wouldn't we?
Might	- There would be strange new comings together—mad new comings together, and we would know what it is to be born. - And then we <i>might</i> know—that we are.

The modal verb *would* in the first sentence is used as a desirable modality states probability and functions as a conditional modal verb associated with 'if'.

The modal verb *would* in the second sentence has a prediction view of what will happen after change.

The last sentence uses the modal verb *might* to express possibility. Claire talks about something that may or may not happen, she shows her own opinion about what will happen after change.

3.2.3. Interpretation (The Discursive Analysis)

a-Turn Taking

At this point the researcher shows who is the dominator of the conversations, who controls the situation and who has the power through speaking. This conversation is between Claire and her husband Harry. The conversation starts with Harry asking about what she wants. Claire tells him that she wants to leave them. She believes that human must not live the same life, one must do things which are different from others. She wants to smash and destroy everything and she

begins with Tom's egg. Claire is the controller of the conversation, Harry just asks short questions and she answers long answers. She controls the conversation and this means that the conversation is not equal. This thing may refer to the power and strong personality of Claire and weak side of Harry. Harry's speech is simple, about the current moments while Claire's speech is more rational and realistic. This is clear through using dynamic (Do, break up (3), born, smash (3), called, made, lock in, worked, grow, take, go, waits) more than stative verbs (Want (2), need, mean, think (2), be, shocked, know).

b-Sentence Length and Complexity

Glaspell uses 5 different sentence structures and types ranging from very simple, two-word and very long sentences in this text.

One of the aims of using this mix is that Glaspell tries to appropriate the style to the subject or content. Thus, wherever Glaspell wants to single something out, she uses simple sentences; but when there an exaggeration or a serious thing, the sentences change to a complex one.

3.2.4. Explanation (*The Social Analysis*)

The social analysis of the play is very important to discover the issues raised at the time of the plays. Within *the Verge*, four main elements are issued: *Feminism*, *Freedom*, *Identity* and *Power*.

1- Feminism

The Verge is a feminist play which contains many feminist ideas and thoughts. Two aspects within feminism are examined in *the Verge* which are the role and image of women and patriarchy:

a. The Role and Image of Women

Glaspell represents Claire who is the rebellion against the old traditions and seeks freedom from society. She has rebelled against the conventional roles in order to make herself new. Claire the heroine of the play, the wife, sister, mother and friend.

b. Patriarchy (The Relationship between Claire, Harry, Dick, Tom and Anthony)

Patriarchy refers to the domination of men over women. Most of societies see that women should be under the rule of men. In this play the three men try to dominate over Claire each one in his own way. The three men have a weak part in Claire's life. *Harry* is Claire's husband, *Tom* the close friend and *Dick* the lover; they all tried to control her but they failed. *Harry*, the ordinary and simple character who does not want to change even his way of eating when he rejects to eat the egg without salt. *Harry* tries like all men in the world to control her but he could not and continue giving her what he thinks as support.

2. Freedom

In order to get freedom Claire uses violence against others like *verbal* and *physical* while *social* violence is represented by the social rules. This play differs from any other feminist plays because here Claire the protagonist uses violence against others not the other, excepting society which strangles her.

a. Verbal Violence

There are many uses of verbal violence in *the verge*, Claire uses verbal violence against Elizabeth, Adelaide and Harry. *HARRY: I am convinced I am the worst thing in the world for you, Claire.*

CLAIRE: (with a smile for his tactics, but shaking her head) I'm afraid you're not. I don't know—perhaps you are. (*The Verge*, p. 62).

This text shows that Harry knows that he is not important in Claire's life but he cannot let her because he loves her. When he asks her she plays with word and at last tells him that perhaps he is, a verbal violence is used by Claire. Adelaide also faces verbal violence from Claire because Claire did not like her sister and her arrival so she uses ugly words to describe her.

a. Physical Violence

Claire uses physical violence in the play against *Tom's egg, the edge vine, Elizabeth and Tom*. In one dialogues, she smashes the egg as she smashes the traditions that she refuses. A physical violence towards an egg but the aim is the social rules. Another physical violence is clear in another dialogue when she destroys the edge vine because it returns to its original shape and with the edge vine she tries to strike Elizabeth but Harry stops her and takes the daughter away. Claire's violence towards Tom is the hardest one because it ends with Tom's death and Claire madness. She loves Tom but kills him because he is an ordinary person has the thoughts and traditions that all men in the world have. So Claire feels that she is in danger, if Tom still alive she will agree with what he wants because her feelings will lead her to do that. So, she kills him to protect herself and thinks that this is a gift for him to be a dead man not an ordinary man.

b. Social Violence

Social violence is not a very clear thing in the play but it can be inferenced through the character's speech. Glaspell has written *the verge* to show how the Victorian society and rules make women feel as they are trapped. At the time of 1921 the play was just completed and produced and females were still obliged to stay at their home and do their domestic duties as a good wife and mother who clean, prepare food, and take care of children. Women were not allowed to vote and work and this was leading to increased resistance. Many women wanted to change the situation and began to voice frustration and dissatisfaction. Also, the feminist movements began at that period. Other women rebelled through showing depression, despondency and sometimes madness just like Claire. So, Claire is the result of the social stress and hard traditions, she chooses to be mad in order to take her freedom, "*Perhaps the madness that gave you birth will burst again*"(*The Verge*, p. 106).

c. Identity

Identity in its two types, self-identity and social identity, is the unique characteristic or personality of a person. Self-identity can be seen in Claire's self-esteem and self-acceptance from the beginning of the play to the end. She feels that she has the regard about human life who feels responsible about them that she divorced her ex-husband and marry another one in order to make change in her life. Another opinion made by Claire through her speech with her daughter about herself is that she is useless especially with her children, i.e., she is not like other mothers. She thinks she has no benefit and no one needs her. While all of them accused her of being mad, Claire said that she is too sane, she just wants to be free from their rules.

Social identity means the other's viewpoint about an individual, the story, the society and others say about an individual. Everyone in Claire's family sees her as a mad person except her assistant Anthony who helps and encourages her. Claire as any Victorian woman at that time seeks freedom from society and family and thinks that only madness will lead to freedom. Society also regards Claire as a mad woman because she rebels against its traditions and wants to be another woman who differs from other women. Claire is considered as an extremist woman who does not obey social

traditions like others who takes care about their families and home only.

e. Power

This ideology is represented by Claire and society. The Victorian society is patriarchal and give permission for men to dominate women which leads to power abuse. Claire refuses to be controlled and performs power against her family. Claire represents the dominance of women whose concern to break old traditions and men's control.

4. RESULTS AND DISCUSSION

The results of the qualitative analysis are reflected in this section in the form of tables and figures in addition to some remarks.

4.1. Description (The Textual Level)

4.1.1. Vocabulary

In *the Verge*, Glaspell uses different types of adjectives (descriptive 62, 55,357%, indefinite 5, 100%, compound 4, 100%, possessive 1, 50%), which have an expressional value. The usage of descriptive adjectives is important to show the personality of the heroine, Claire. She uses this kind to describe her plants which means that Claire is an emotional person only when she talks about her plants and describes things rather than actions. In the level of vocabulary of *the Wedding Band* Childress also focuses on adjectives and nouns. She uses only two types of adjectives (descriptive 50, 44,642%, possessive 1, 50%) with an expressional value. Childress uses descriptive adjectives more than other types to show the inner conflict of her characters. Julia Herman and the others describe their situation in an emotional way so, descriptive adjectives are the suitable for that as shown in table (7) and figure (2).

Table 7. Adjectives in *the Verge* and *the Wedding Band*

Types of Adjectives	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Descriptive	62	55.357%	50	44.642%	112	91%
Indefinite	5	100%	0	0%	5	4%
Compound	4	100%	0	0%	4	3%
Possessive	1	50%	1	50%	2	2%
Total	72	58.536%	51	41.463%	123	100%

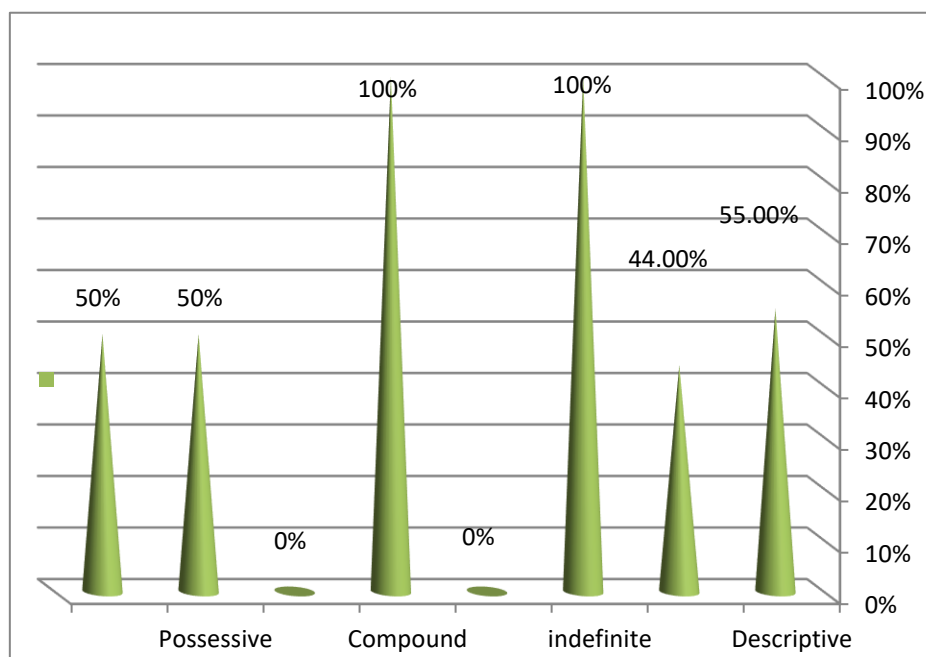
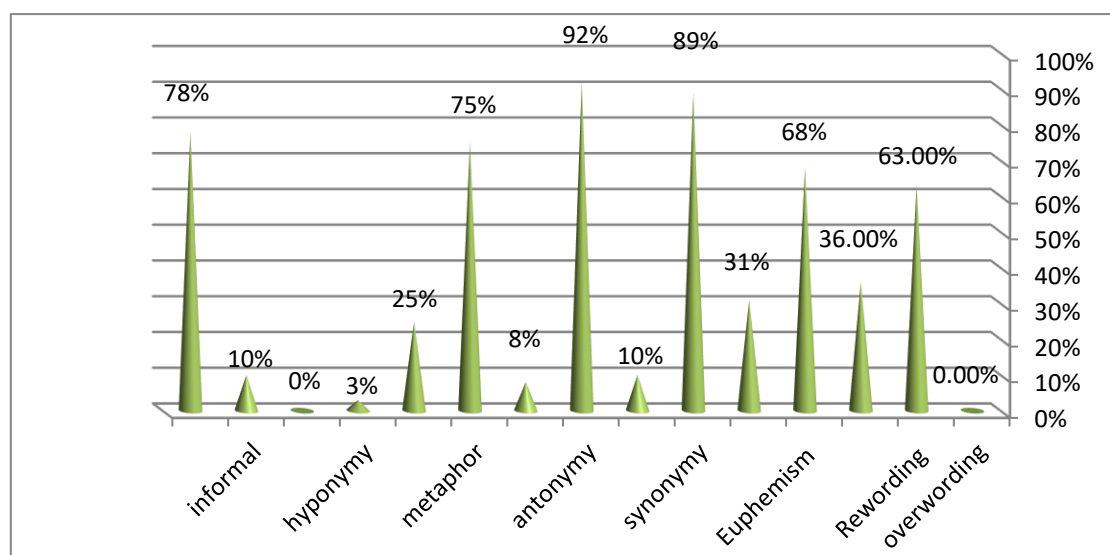


Fig 2. Adjectives in The Verge and The Wedding Band

Concerning Nouns, Glaspell uses different forms like (rewording 47, 63,513%, overwording 29, 100%, synonymy 34, 89,473%,). Rewording has the large usage through the play which has expressional values. The usage of rewording means that Claire wants to elaborate and paraphrase her ideas to convince people while synonymy refers to her way in repeating things in different situations and times. Antonymy also has been used in a wide range which refers to Clair's inner conflict and to show that her life is full of contradictions. Glaspell uses all these kinds in her philosophical play to emphasize and enrich her idea about feminism. In *the Wedding Band*, Childress also uses different forms of nouns like (rewording 36,468, 74%, informal 9, 90%, euphemism 5, 31,25%, synonymy 4, 10,562%,) as in Table (8). Here as in *the verge* rewording has the large usage which is important and useful to show how the writer tries hard to express and elaborate the struggles of her characters.

Table 8. Nouns in *the Verge* and *the Wedding Band*

Types of Nouns	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Overwording	29	100%	0	0%	29	14%
Rewording	47	63.513%	27	36.486%	74	36%
Euphemism	11	68.751%	9	31.25%	16	8%
Synonymy	34	89.473%	5	10.562%	38	18%
Antonymy	18	92%	4	8%	25	12%
Metaphor	9	75%	3	25%	12	6%
Hyponymy	1	2,960%	0	0%	1	6%
Informal	1	10%	50	98,039%	10	5%
Total	150	75 %	25	24.154	205	100%

Fig 3. Nouns in *The Verge* and *The Wedding Band*

It is clear that both of the playwrights focus on descriptive adjectives in their plays. It can be summarized from this point that the most obvious themes in the two plays are to show the inner conflict of women at that time and how they will get their freedom and the result of their rebellion. Both of them try to show the bad side and the real life of their character (black and white characters) by using descriptive adjectives.

4.1.2. Grammar

In *the Verge*, Glaspell had used the two types of verbs but focused on dynamic verbs more than stative. She uses dynamic (106, 61,627%) and stative (30, 12,857%) verbs as in Table (9). This technique shows that Claire is a rebellion woman, when she talks about herself she uses dynamic verbs to show her power, energy and desire to change, but when she talks about others she uses stative verbs to show that others are unable to change. Regarding *Verbs* in *the Wedding Band*, Childress also had used the two types of verbs but focused on dynamic verbs, as in Table (9). The usage of dynamic (38, 372%) more than stative (30, 42%) means that the characters are rational and realistic whey the talk about themselves. In the two plays the writers focus on dynamic verbs. They present the powerful characters, women who have the power to rebel against law, to fight to get their rights.

Table 9. Verbs in *the Verge* and *the Wedding Band*

Types of verbs	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Dynamic	106	61,627%	66	38,372%	172	71%
Static	30	42,857%	40	57,142%	70	29%
Thoughts and opinions	21	52,5%	19	47,5%	40	17%
Sense and perception	6	42,857%	8	57,142%	14	6%
Emotions and wants	3	30%	7	70%	10	4%
Possession	0	0%	5	100%	5	2%
Existence	0	0%	1	100%	1	0%
Total	166	33,205%	146	46,794%	242	100%

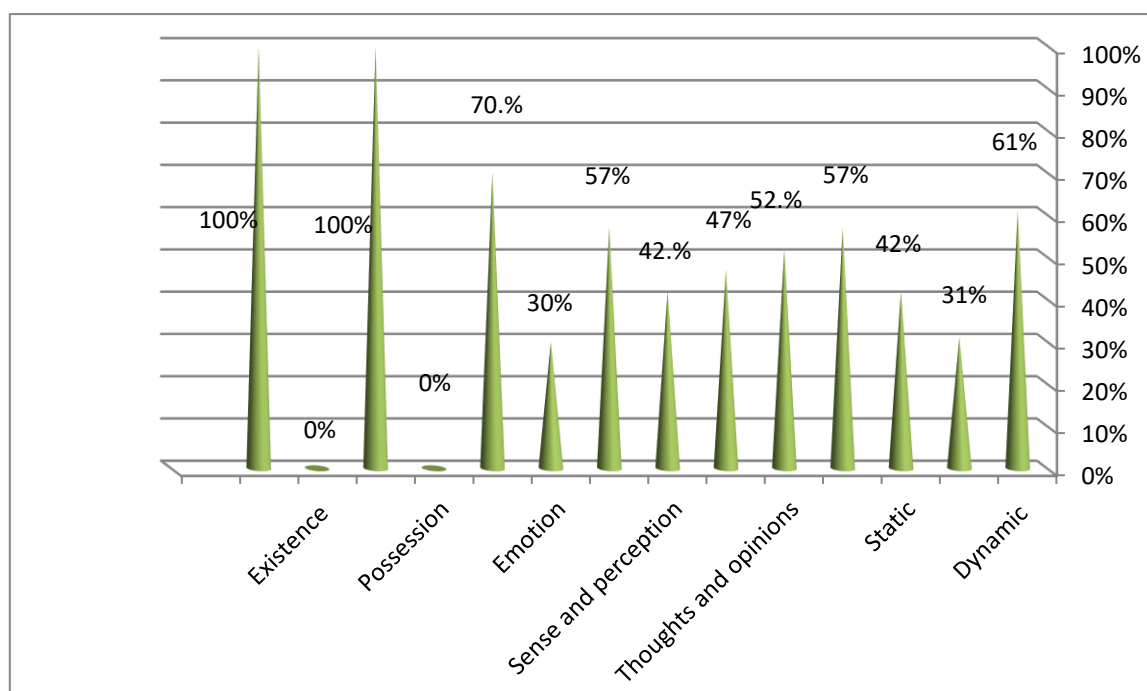


Fig 4. Verbs in The Verge and The Wedding Band

Sentences in the selected data in *the Verge* are of three types. Declaratives are the most kind that used by Glaspell. In *the Wedding Band* Childress also uses declaratives more than other types. Table (10) shows that (declaratives 38,28% interrogatives 12,903). Glaspell and Childress used declaratives in their plays because the characters' speech contains mainly knowledge, opinions, facts and their point of view.

Table 10. Sentence Types in *the Verge* and *the Wedding Band*

Types of Sentences	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Declarative	158	61,718%	98	38,28%	256	88%
Interrogative	27	87,096%	4	12,903%	31	11%
Imperative	5	100%	0	0%	5	2%
Total	190	100%	102	100%	292	100%

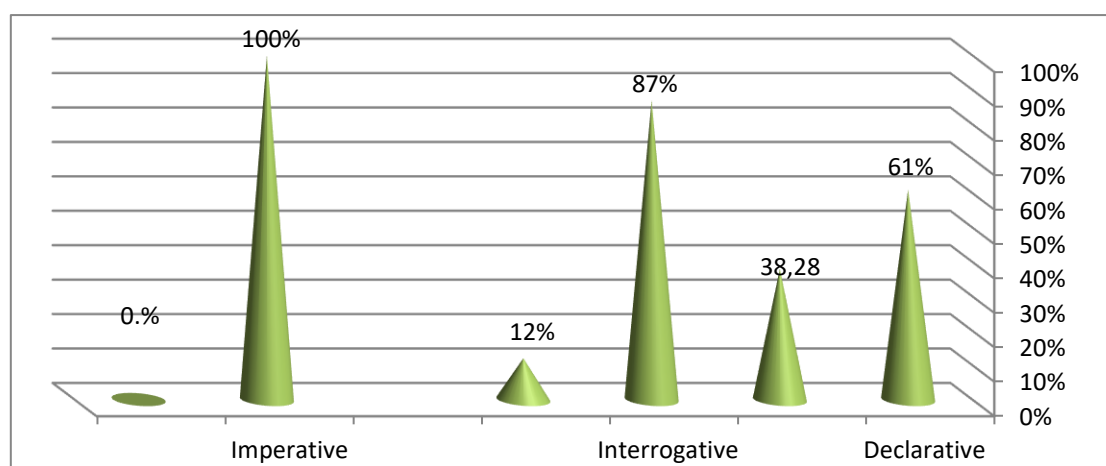


Fig 5. Sentence Types in The Verge and The Wedding Band

Modality in *the Verge* focuses on prediction (7, 87%) as in Table (11) which is widely used by Claire throughout the play. Claire uses this technique of modality when she talks about her plants and to tell others about what will happen in the future. Glaspell uses prediction to show that Claire is a dreamy person who is eager to change. Claire has the power to say what will happen and what will do in the future, she is free to say anything but not to do what she wants because she is limited by the social traditions. The usage of prediction emphasizes the idea that Claire is a rebellion, fights to get her freedom and to do what the feminist movement wants women to do. In *the Wedding Band* ability (5, 33%) is the widest used by the characters throughout the play. The technique of modality shows that the characters talk about something they may or may not be able to do. Childress's characters are ruled by patriarchy, laws, government and the white society, so, they imply ability in their speech more than other characteristics. Ability reflects Julia's strong desire to gain her rights that she may or may not get.

Table 11. Modality in *the Verge* and *the Wedding Band*

Types of Modality	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Ability	6	23%	5	33%	11	27%
Prediction	7	87%	1	12,5%	8	20%
Certainty	4	100%	0	0%	4	10%
Advice	1	100%	0	0%	1	2%
Opinion	1	100%	0	0%	1	2%
Possibility	3	42,857%	4	57,142%	7	17%
Promise	1	100%	0	0%	1	2%
Warning	2	100%	0	0%	2	5%
Request	1	100%	0	0%	1	2%
Probability	0	0%	2	100%	2	5%
Conditional	0	0%	1	100%	1	2%
Reference to the past	0	0%	1	100%	1	2%
Intention& decision	0	0%	1	100%	1	2%
Total	26	63,414%	15	36,585%	41	100%

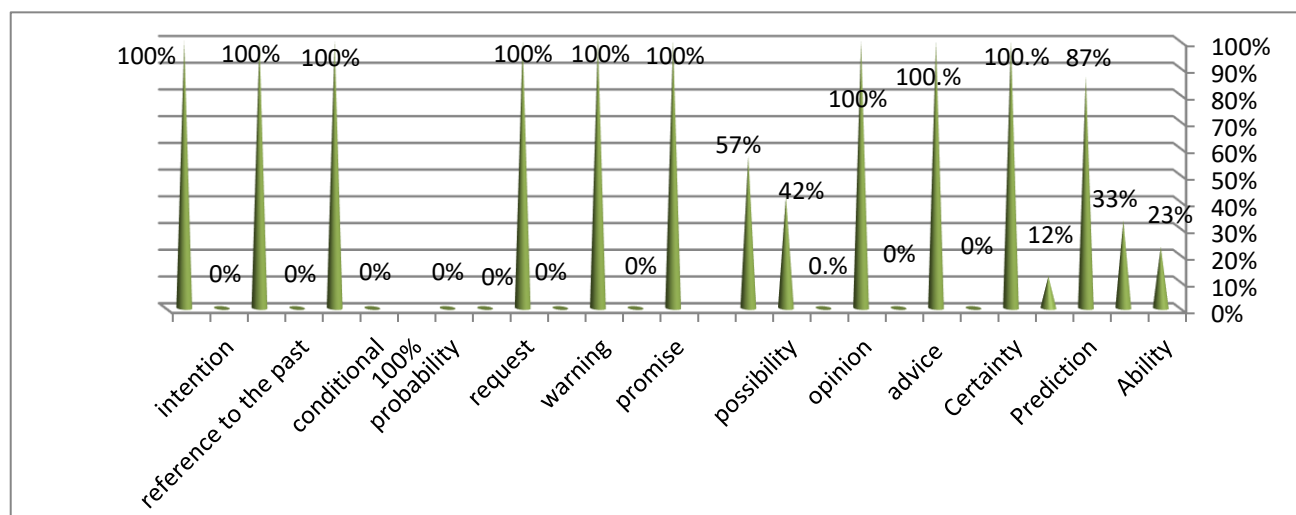


Fig 6. Modality in The Verge and The Wedding Band

Turn Taking strategy throughout *the Verge* shows that Claire is the dominator of the conversations most of the time. *The Verge* makes use of turn taking (5, 555%) more than *The Wedding Band* (4, 444%). This is the difference between *Claire* and *Julia*: *Claire* is strong, she has the power to do what she wants even when others do not like it, even at the end she takes her freedom by going mad. While *Julia* has less power than *Claire*, *Herman*, the mother, the sister and her neighbors take their turn and make her silent. *Julia* is strong in the side of her relationship with *Herman*, but weak in the side of society, she cannot tell anybody about her love and stays ten years ended with the death of her man and dream. So, *Julia* wins and loses at the same time, she loses her love and wins her freedom by the death of her love.

Table 12. Turn Taking in *the Verge* and *the Wedding Band*

Turn Taking	<i>The Verge</i>		Turn Taking	<i>The Wedding Band</i>		Total	
	F	P		F	P	F	P
Claire	4	66,666%	Julia	2	33,333%	6	67%
Tom	1	50%	Herman	1	50%	2	22%
Harry	0	0%	The neighbors	1	100%	1	11%
Dick	0	0%					
Total	5	55,555%	Total	4	44,444%	9	100%

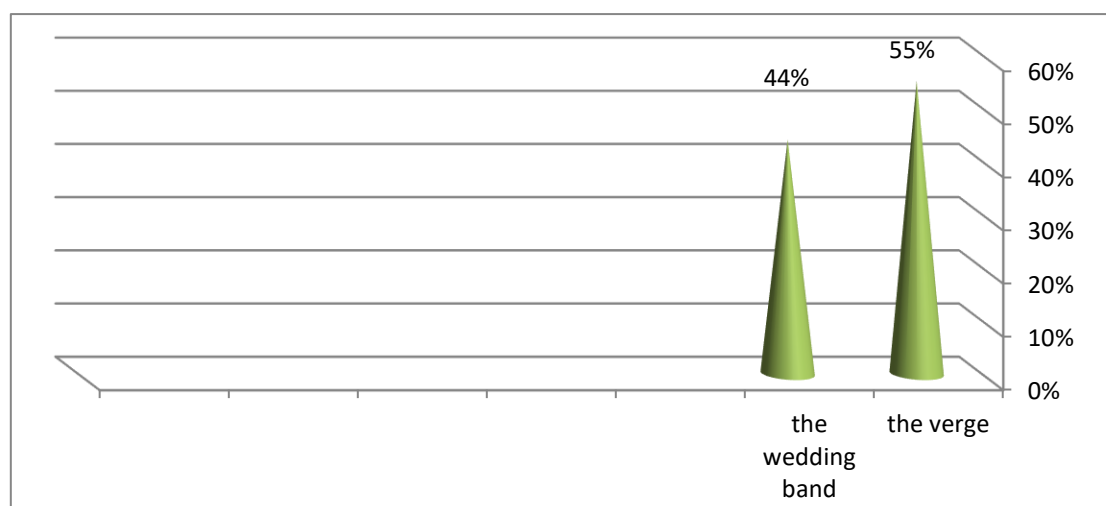


Fig 7. Turn Taking in The Verge and The Wedding Band

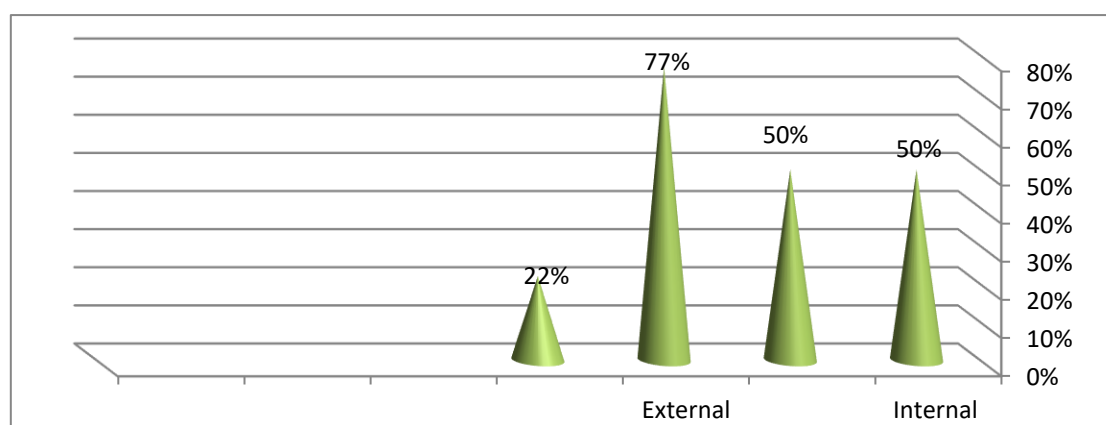
The above analysis shows that textual strategies are more utilized in *the Verge* than in *the Wedding Band*. This means that Glaspell tries to highlight the feminist ideologies in *the Verge* more than those used in *the Wedding Band*.

4.2. Interpretation (Discursive Analysis)

In this level of discursive analysis intertextuality with its two types is used heavily in *the Verge*. Glaspell uses external intertextuality (64,705%) more than internal (35,294%) as in Table (13), because her play is based on philosophical ideas, famous characters and real events which requires such a use. External intertextuality is used to show that Claire is a philosophical and educated person, while internal intertextuality shows that this character has nothing to do but remembering the past and repeats her previous events and speech. This shows that this is a powerless person. In *the Wedding Band*, internal intertextuality is used more than external. Childress wants to show how her characters are poor, little educated and weak. Intertextuality in the discursive level, is used in *the Verge* more than in *the Wedding Band* which means that Glaspell's characters are more educated than Childress's characters.

Table 13. Intertextuality in *the Verge* and *the Wedding Band*

Types of Intertextuality	<i>The Verge</i>		<i>The Wedding Band</i>		Total	
	F	P	F	P	F	P
Internal	4	50%	4	50%	8	47%
External	7	77,777%	2	22,222%	9	53%
Total	11	64,705%	6	35,294%	17	100%

Fig8. Intertextuality in *The Verge* and *The Wedding Band*

4.3. Explanation (Social Analysis)

There are many aspects within this level such as feminism, freedom, violence, racism, identity and power. *Feminism* can be seen through the role of women in the play, as mentioned earlier, all the women in *the verge* have no rights, weak, and do what society obliged them to do except Claire who has the power to rebel against these traditions. She has the main role and the chance to be the new woman at her time. In *the Wedding Band* most of the women are weak, and do what society obliged them to do. Julia has the power to be in an interracial relationship but she still weak. Patriarchy also rules the women black and white, black women are not able to marry a white man or divorce even from a man who has the same color. On the other hand, white women are also controlled by the laws that a white woman cannot marry a black man, a white woman must marry a man from the same class to protect the image of her family like Annabelle, and a white woman is obliged to ignore the black even if she did not like the idea of racism.

With respect to *freedom*, Claire uses different types of violence in order to be free, she uses verbal and physical violence against others while social violence is represented by the social Victorian traditions. So, Claire is the source of violence not others and this is not an ordinary thing with feminism which represents woman as a weak, oppressed and cannot get her rights while Glaspell represents the new form of woman who has the power to change herself.

Violence is represented in *the Wedding Band* with its two types *verbal* and *physical* violence which are used against others. Here, society and its law is the source of violence not others, while the whites are only the instruments that obey the rules of the society. The women of Childress are weak like all the women at that time, the highest power is with Julia who dare to make an interracial relationship.

Concerning *identity* in *the Verge*, self-identity shows how Claire believes that she wants her rights through rebellion and she is insane not mad as others see her, she sees what others cannot see, she is not like other women who are trapped by social traditions. *Social identity* shows how others see Claire, her family members see her as a mad woman, society see and regard her as a rebellion woman who breaks its rules and traditions which is forbidden at that time. Self-identity in the *Wedding Band* shows how Julia believes that she wants to marry her man even if they move to another country while social identity shows how others see Julia, the society, her neighbors and the family of Herman.

Racism is not found as clearly in *the Verge* as in *the Wedding Band* with the black and white, Christian, Jews, Asian and other women. The people of different classes of society suffer from racial problems like Julia and Herman, Annabelle

and the sailor, Mattie and her lover. Social rules that lead to racism and people only obey these rules.

Power is represented in *the Verge* by Claire and society. The Victorian society is patriarchal and give permission for men to dominate women which leads to power abuse. Claire refuses to be controlled and performs power against her family. Claire represents the dominance of women whose concern to break old traditions and men's control. In *the Wedding Band* power is a clear sign, it is represented by many factors. First, the law which forbids interracial marriage like Julia and Herman and the patriarchal society. Second, the dominance and oppression of the white over the black like Herman's mother and Julia. Third, the dominance of the white and black over their race like the bad treatment of fanny with other black women, and Herman's mother with her daughter.

5. Conclusions

The Verge (1921) and *the Wedding Band* (1966) both talk about approximately the same period. The actions of the two plays revolve in the period of the World War 1 between (1914-1918) when the patriarchal society controls women with different rules and traditions. *Susan Glaspell* and *Alice Childress* present the image of women at that time, Glaspell presents the white woman and how she takes her freedom from society, while Childress presents the image of the black woman who suffers and struggles to get her rights. Both of the writers and their plays are feminist and dealt with women issues and problems in different societies. Glaspell shows how the white woman in the Victorian society suffers, struggles and finally gets her freedom by a strange tool which is madness (because society will not punish mad women). The white woman at that time is allowed to divorce like Claire but is not free to do what she wants. At the end of the play, Claire takes her freedom by killing Tom and going mad which is the way to freedom. While Childress shows how the black woman is districted by society, she is not allowed to divorce, to marry a white man and even to live like a white woman. So, it is clear that both black and white women suffer at that time in different ways, and both of them try to get their freedom in different ways.

It also be concluded that grammar and intertextuality are the most commonly utilized strategies in the two plays in relation to the textual and the discursive levels; whereas freedom, is the main social strategy of the two plays which reflects the state of feminist society at the time of writing the two plays. Other strategies that are used in conveying feminism are violence, feminism, racism, ideology and power.

Based on this study, it is recommended that CDA must be taught carefully since it is the gate to understand the language of the texts and characters and this can produce inspiring pedagogical implications.

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ORIGINAL ARTICLE

The Experiences and Challenges of Mothers of Adult Patients with Mucopolysaccharidosis; Mothers of Adults with Severe Mucopolysaccharidosis

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ABSTRACT

Although many studies have examined the treatment and symptoms of children with MPS, very few studies have focused on adults with MPS. This study aimed to clarify the experiences and challenges of mothers of adult patients with severe mucopolysaccharidosis (MPS) who live at home. The data from semi-structured interviews with twelve mothers (patients' ages ranged 19-44 years) were analyzed. The following six categories were extracted: fear that the disease will continue to progress despite treatment, tired of shifting gears in care and healing, fatigue due to multi-department visits to control the progression of the disease, the pain of not being able to see a bright future, desperate for new treatment methods for MPS, and developing care and a place to stay after parental support is gone. A unique issue of patients with MPS is that enzyme replacement therapy must be continued throughout life, and there is an urgent need to create a system that allows patients with severe MPS to receive enzyme replacement therapy for the rest of their lives, even after their parents pass away.

Keywords: Pediatric Home Care, family nursing, rare disease support, transitional care, mucopolysaccharidosis

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1. Introduction

Mucopolysaccharidosis (MPS) is a rare, hereditary, and intractable disease in which mucopolysaccharide progressively accumulates in systemic organs and tissues due to congenital deficiency or reduced activity of mucopolysaccharidoses, resulting in a variety of symptoms. In Japan, 467 cases have been diagnosed in 27 years, and the incidence of MPS is approximately 1 per 59,000 people¹⁾.

MPS is classified into seven disease types according to the defective enzymes, clinical symptoms, and accumulated substances: Hurler (IH type), Scheie (IS type), Hunter (Type II), Sanfilippo (Type III), Morquio A (Type IV A), Morquio B (Type IV B), Moroteaux-Lamy (Type VI, and Sly (Type VII) (Types V and VIII are missing numbers). When left untreated, patients with this disease become bedridden in their teens and eventually die by age 20^{2,3)}. However, at present, due to early detection through prenatal diagnosis and optional screening, early initiation of enzyme replacement therapy, and reforms in medical welfare, the number of patients who reach adulthood and are able to live in the community is increasing. Enzyme replacement therapy is a therapeutic method in which the deficient enzyme is replenished from outside the body in the form of preparations, and the symptoms are improved by decomposing glucosaminoglycans accumulated in lysosomes. Since the administered enzyme decomposes and disappears in a relatively short period of time in vivo, patients need to go to a specialized hospital once a week and continue intravenous administration for four to six hours for the rest of their lives⁴⁾. Therefore, most families of patients wish to implement enzyme replacement therapy at home⁵⁾.

Several studies have reported on this disease. Muenzer et al. reported that enzyme replacement therapy reduces hepatomegaly and macroglossia, thus improving dyspnea, while Simon et al. reported that it reduces joint contracture and improves joint mobility^{6,7)}. Giugliani et al. also reported that although the patient survival rates and quality of life have significantly improved, even with enzyme replacement therapy, intravenously administered enzymes cannot cross the blood-brain barrier; thus, they have no effect on the central nervous system⁸⁾. Doherty et al. reported that enzyme replacement therapy has limited effects on the skeletal system⁹⁾. Fabiano et al. noted that the therapy has limited effects on valvular heart disease and is ineffective in enlarging the aortic root of the heart¹⁰⁾. Tsurusaki et al. claimed that long-term enzyme replacement therapy (up to nine years) resulted in 40% of adverse events and 25.6% improvement in symptoms¹¹⁾. Francisco et al. reported that the relief of symptoms did not reduce disease progression or mortality¹²⁾. In 2021, an enzyme preparation that can cross the blood-brain barrier and a reservoir-mediated intracerebroventricular drug was approved for MPS II^{13,14)}. Sustained increases in the developmental index were also observed in three cases in which intracerebroventricular administration was started before the age of three¹⁵⁾. Currently, the development of chaperone and gene therapies is progressing, and further improvements in activities of daily living (ADL) and extension of life expectancy can be expected in the future.

Regarding previous Japanese and international research on children/persons with MPS and their families, Kubo et al. reported that 63% of the parents of MPS patients are stressed, resulting from the inability to communicate with the sick child/person and bathing assistance¹⁶⁾. Furthermore, Kubo reported that parents, especially mothers, feel remorse and pity for their sick children¹⁷⁾. Kubo also noted that along with the development of therapeutic methods, parents request specialists to reduce symptoms and improve quality of life as treatment methods¹⁷⁾. Moreover, Kubo et al. also reported that, while feeling joy and satisfaction with enzyme replacement therapy, parents are dissatisfied with the side effects and think that its effects are limited¹⁸⁾. According to our previous study, in many cases, parents perceive that the sick child/person will not live long enough to reach adulthood, and as such, mothers do not prepare measures to address the

disease should their child reach adulthood. We reported that the indifference of others and the lack of a place to share information about death and heredity hindered parents' grief work when their children died¹⁹⁾. Somanadhan et al. revealed that the experience of living with MPS, a rare inherited disease, poses problems of stigma and isolation²⁰⁾. Meanwhile, Zengin et al. noted that parents of MPS patients have many difficulties related to the multilineage problems brought on by MPS²¹⁾. Finally, Kang clarified that the MPS II parenting process is a "maze-navigating experience" and has three stages, namely, entering the unknown, struggling to escape from the unknown, and settling in the unknown²²⁾.

Many of these surveys targeting MPS in Japan and overseas focused on people who have not reached adulthood. We did not find any studies limited to adults with MPS or their families, which means that there are many uncertainties about the condition and home life of adult patients.

According to our survey, many adult MPS patients experience a decline in ADL as the disease progresses and become severely mentally and physically disabled (hereafter referred to as patients with severe MPS), and efforts are underway to improve patients' home life by gradually increasing outpatient support and home visit support²³⁾. Previous studies on home-dwelling children/people with severe mental and physical disabilities revealed that their lives depend on the care of their parents as well as community support, but sibling support is inadequate^{24,25)}. These studies also delved into their satisfaction and anxiety with home-based support, and investigated transitional support from hospital to home/facility, and needs for home care²⁶⁻³²⁾. Many caregivers are mothers and do not receive the cooperation of other people³³⁾. Furthermore, the mothers' sense of the burden of childcare consists of "difficulty in daily life," "anxiety about childcare," and "restrictions on social roles." It has been clarified that the severity of the disability, the mother's perception of the child, the husband's cooperation, and support from the surroundings greatly affect the burden of childcare³⁴⁾.

In the case of children/people with severe mental and physical disabilities, many are living at home centered on nursing care, but patients with severe MPS in adulthood are characterized by living at home while receiving enzyme replacement therapy and requiring medical care such as ventilators, gastrostomy, and urinary catheterization²³⁾.

Normally, after graduating from high school, children go through a developmental process of becoming independent from their parents. In Japan, mothers of children and persons with severe mental and physical disabilities who require medical care are constrained both externally and internally by the role of care, and the mother and child are in a state of oneness^{35,36)}.

Therefore, in this study, we conducted interviews with mothers, who are the patients' advocates, to clarify the experiences and challenges of mothers living at home with adults with severe MPS. We aim to further improve the quality of life of adult patients with MPS and their families, and we wish to elucidate ways to promote patients' independence.

2. Objectives and significance

2.1. Objectives

This study aims to clarify the experiences and challenges of mothers living at home with adults with severe MPS.

2.2. Significance

Due to recent advances in medical health and welfare and the development of treatment methods, it is speculated that adult patients with severe MPS will be able to live at home for a longer period. However, it is certain that the disease progresses, and by clarifying the experiences and challenges of mothers living at home with adults with severe MPS and

their preparations after a parent's death, the results of this study will become material for considering the life support that they and their families want. Furthermore, there is a rapid increase in the number of children requiring medical care and children dependent on advanced medical care. We believe that the results of this survey can also provide suggestions regarding support for their adulthood.

3. Research methods

3.1. Definition of terms in this study

3.1.1. Genetic, rare, and intractable diseases

There are many intractable and genetic diseases. Hereditary, rare, and intractable diseases in this study are defined as those with autosomal or sex chromosome inheritance, and among extremely rare diseases, progressive diseases for which no curative therapies have been established.

3.1.2. Adult MPS patients

This study included MPS patients aged 18 years or older.

3.1.3. Experiences

With reference to the definition of a previous study, experience is defined as “an event that leaves a lasting impression when humans (i.e., mothers of patients with MPS), who are social beings with physicality, encounter an uncertain situation, and their mental and physical states at that time, especially their physical sensations and reactions during a limited period. As a result, developmental changes, self-acceptance, positive emotions, negative emotions, discovering the meaning of one's existence, restructuring of relationships, and phenomena indicating acquisition and mastery are found”³⁷⁾.

3.2. Design

This was a qualitative descriptive study. Qualitative descriptive research is a research method that discovers and understands phenomena, processes, or the perspectives and worldviews of those involved³⁸⁾. The aim is then to use the target language to create a clear explanation and comprehensive concept of the target phenomenon³⁹⁾. This study utilized qualitative descriptive research to explore the experiences and daily challenges of mothers of adult children with severe MPS—a progressive and incurable disease.

3.3. Survey method

According to an interview guide, semi-structured interviews were conducted with mothers of adults with severe MPS.

3.3.1. Participants

Participants (N = 12) were mothers of adults with severe MPS. They were members (or friends of members) of the Japan Mucopolysaccharidosis Patient Family Association. All mothers consented to participate in this study. The number of interviews was one to three per person, and each interview lasted 60 to 120 minutes.

The disease types of the interviewees were type II (Hunter), type III (Sanfilippo), and type IV (Morquio). Type I (Hurler, Scheie) and type VI (Marrow-Lamy) were outside the definition of severe adult MPS patients and were excluded from the

study. There are currently 174 members of The Japanese Society of the Patients and the Families with Mucopolysaccharidoses, and since it is a rare and intractable disease affecting only approximately 300 people nationwide, we believe that even 12 members will deliver valuable data. It was determined that the data were saturated because no new information appeared during data collection⁴⁰).

3.3.2. Interview details

The interview includes basic attributes, current health problems, treatment, life and anguish, support received and reasons, hopes for future treatment and support, thoughts, actions, preparations, and what they felt at that time.

3.3.3. Survey period

April–October 2022

3.4. Data analysis and description

Interviews were transcribed verbatim. From the verbatim record, narratives related to the research purpose were coded by dividing them into “phrases,” comparatively analyzed based on similarities and differences, and classified into subcategories and categories by increasing the degree of abstraction. A storyline was created from the relationships between categories. The subcategories and categories of the analysis results were presented to the supervisor of this research and to a research advisor who is qualified as a nurse, and they were judged for their validity.

3.5. Ethical considerations

This study was conducted with the approval of the ethics review committee of the affiliated university (Institutional Review Board of Tokyo Medical and Health University Kyo-32-38D, Daito Bunka University Human Life Science and Medical Research Institutional Review Board DHR21-011). We explained in writing that the subject’s free will was guaranteed, that there would be no benefit or disadvantage due to the presence or absence of cooperation, the method of publishing the survey results, and voice recording during the interview, and so on, and consent was obtained. At the time of the interview, the purpose and method of the study were explained again, and the interview was started after written consent was obtained. Since interviews can be traumatic for some subjects, we explained that the interview could be stopped at any point should they feel uncomfortable. Furthermore, the interviewer had learned counseling techniques. To protect personal information and privacy, the data were anonymized.

4. Results

4.1. Background of subjects

Patients' ages ranged 19–44 years at the time of the interview, and eight of them had siblings. All participants were born before enzyme replacement therapy was approved, and their doctors told them at the time of their diagnosis that their life expectancy would be short. At the time of the interview, nine patients were being fed by tube, seven had a tracheostomy, and seven were using a ventilator. In addition, all patients required suction from time to time and were severely mentally and physically disabled. To protect personal information and privacy, we anonymized the data so that individuals cannot be identified by abstracting descriptions that can identify proper nouns or subjects in the data.

4.2. The experiences of mothers caring for adult patients with severe MPS at home and preparations for life after the death of a parent

As a result of the analysis, six categories and 21 subcategories were extracted. The categories are written in **bold**, subcategories are *italicized*, remarks by the subjects are in quotation marks, and supplementary comments by the author are written inside parentheses. The description of each category is as follows.

4.2.1. Category 1: Fear that the disease will continue to progress despite treatment

As the disease progressed, mothers became *discouraged by the disease progression*.

“I was losing my child more and more and thought that they were becoming a mere spectacle as they felt alienated after having been confined to a wheelchair and losing their ability to speak.”

“I was told (by the attending physician) that, considering the future progression of this disease, it would be easier for my child if they underwent laryngotracheal separation. I have been thinking about it for a long time, but my child would lose their voice and even though they cannot talk, they can still make sounds, so I hate the thought of them being unable to cry.”

When one mother's child became an adult, she discovered that she had valvular heart disease and retinitis pigmentosa, which had been asymptomatic when she was a minor, and she was *confused by her unexpected condition*.

“My child has glaucoma and is taking medication to lower my intraocular pressure, but their eyesight is getting worse and worse. I'm worried because there is no treatment for their eyes (retina),”

“He was diagnosed with valvular heart disease during a medical examination.”

4.4.2. Category 2: Tired of shifting gears in care and healing

Mothers were *disappointed in the effectiveness of enzyme replacement therapy* as the disease continued to progress.

“I can't deny my disappointment with the enzyme.”

“Everyone expected that they might (get better) and I thought that their (bodily functions) would never decline, but they did a little.”

Because the effects of enzyme replacement therapy are unclear, there was a *fear that halving the treatment would lead to progression of the disease*.

“I have been told (by the attending physician) that it is now possible to do the therapy every two weeks. But perhaps this may accelerate the current rate of progression. When I was told that, I really felt like I had to do my best.”

4.2.3. Category 3: Fatigue due to multi-department visits to control the progression of the disease

Mothers said that *taking the children to the hospital is hard work* because the hospitals where they can receive enzyme replacement therapy are far away, and because the children are larger than when they were minors, more supplies are needed.

“[Moving to the hospital] is long and causes a lot of fatigue to the child”

“It is difficult to prepare to go to the hospital. Preparing welfare taxis, preparing for aspiration and injection, and arranging goods and people are difficult.”

Mothers said they felt pressured to undergo enzyme replacement therapy once a week, and that they felt *physical*

exhaustion due to frequent and long hospital visits.

“My child has an intravenous drip once a week, and it’s a lot of pressure, so I’m worried that it would break their body even though it won’t.”

“We do (enzyme replacement therapy) once a week. Moreover, we spend a day in the hospital because we must do enzyme replacement therapy plus albumin. Enzyme replacement therapy takes about three hours, and plus the albumin, it takes an additional two hours, which brings the total to five hours. That’s why we come home very tired.”

Hospital visits are a burden not only for parents but also for children, and were *concerns that visits to the hospital will worsen patients’ condition.*

“My child has [a] fever every time they come home from the hospital,”

“If my child goes to enzyme replacement therapy and gets sick repeatedly, they will become bedridden.”

Since they visit the hospital during weekdays, there are *restrictions on the social life of children and parents accompanying them on hospital visits.*

“Parents themselves have to take time off from work to take their children to the hospital.”

“He has to miss school or leave early, and my child’s enjoyment decreases.”

In cases in which patients are transitioning from pediatrics to adult medicine, they receive consultations at multiple departments and hospitals. This led to *mental and physical fatigue from visiting multiple departments and hospitals* and a *desire for a single department.*

“It’s a pattern of going to a hospital to receive enzyme replacement therapy after going to a rehabilitation specialist for an hour in the morning.”

“Plastic surgery, ophthalmology, cardiology, ERT (enzyme replacement therapy), regular checkups, all of them are different, which makes it hard to go to the doctor.”

“I wished the departments were in one place.”

4.2.4. Category 4: The pain of not being able to see a bright future

Enzyme replacement therapy was the only treatment available even as the disease progressed, and mothers expressed *a sense of obligation to continue treatment for the child’s life.*

“It’s a long-term battle. It’s going to be a long battle. I still can’t see ahead. Using enzymes has only made it more difficult to see what’s ahead.”

“It’s tough to think that I can get away with this condition because I’m doing enzyme therapy, but I have no choice but to continue doing it for the rest of my life.”

As the condition progressed and medical care was introduced, mothers were left alone to take on the role of an ICU nurse, feeling *nervous and anxious about providing care to protect their children’s lives.*

“Just by changing the child’s position, the oxygen suddenly drops; so, every day was like being an emergency rescue worker. I had to suction, evacuate, aspirate, evacuate over and over again.”

“I get inhaled at night; so, I wake up in the middle of the night, and it’s getting hard to wake up, and I wake up thinking it’s dangerous.”

Additionally, as mothers aged, they faced challenges such as *the transition from childcare to nursing care and their own limitations.*

“What I’m doing now is not childcare, but nursing care. Until my child enters the facility, I wonder if it will stay like this unless he goes to the facility.”

“I haven’t been able to sleep properly for 10 years.”

When the welfare system was being changed, even though their condition had not changed, they felt *confused about the disparity in public support based on their children’s ages*.

“There is a wall between specific childhood chronic diseases (medical cost subsidies for specific childhood chronic diseases) and specific diseases (support for intractable diseases). ...Does it cost that much? I was prepared, but eh, this much?”

“You can rent lifts if you have elderly care (long-term care insurance), but children of this age have to buy everything because there are no rentals.”

“It would be nice if we could create a system for intractable disease welfare, similar to welfare for the elderly and people with disabilities.”

Adult patients with severe MPS require medical care; thus, mothers talked about the *difficulty using facilities owing to a lack of medical personnel*.

“Especially around here, there are no facilities to look after medical care.”

“There are few facilities for the center of gravity (severely mentally and physically disabled), and there are no facilities that provide medical care.”

When the siblings of the affected children reached marriageable age, they *experienced not being able to tell their relatives about the genetic disease*.

“I haven’t told my parents (my parents) about my siblings or my genetics, and I don’t have anything to say.”

“When I got married, I honestly wondered what would happen. (My siblings and spouse) go to the same junior high school, so I must tell them about their sibling (MPS patient). It seems like they thought the patient had some kind of disability or an illness, but they choose to not ask too much about it, so I think I have to say it.”

4.2.5. Category5: Desperate for new treatment methods for MPS

Those who could not use home-based enzyme replacement therapy said that *home-based enzyme replacement therapy was psychologically relaxing*.

“We can have it at home, and I have had COVID-19, so I feel a little better mentally.”

Additionally, there was a *desire to try a new drug, even if it was through a clinical trial*, and discontinuing enzyme replacement therapy became less and less of an option.

“[After using the new drug], my child was able to recall a song and sing along to the music. ”

“What about those who are undergoing clinical trials? I wonder if things are getting better. If things are getting better, I would like to have my child undergo a clinical trial.”

Mothers had been *hoping for gene therapy* ever since their children were diagnosed with a rare and incurable disease.

“If gene therapy is successful, it will be possible to treat mucopolysaccharidosis. Gene therapy is 10 to 20 years away.”

“Right now, drug development seems to be progressing, so if we work hard now, it might be a little easier in the future.”

4.2.6. Category 6: Developing care and a place to stay after parental support is gone

Mothers *wanted a place where their children could have fun and feel safe* after losing parental support.

“A child’s purpose is to have fun.”

“I am looking for a comfortable place for my child while using respite services.”

One mother was worried about what will happen to her child after she dies. She was *searching for financial independence and guardianship*.

“There is a public hospital, so I would like to have about two beds available and use it in conjunction with the guardianship system. I’ll pay the money properly; and when I die, I’ll donate my assets to the city, so I want my child to be admitted to the hospital.”

In addition to aiming to build a place for children to live and improve quality of life, they also *began training supporters to provide the same care as their parents*.

“We are thinking that our children will die after we die, so we have to have various people take care of us and learn how to take care of them.”

“It’s important that everyone can do the same care.”

4.2.7. Storyline by categories

As children’s condition progressed and they transitioned to adult medical care, mothers experienced **fear that the disease will continue to progress despite treatment** and were **tired of shifting gears in care and healing** regarding whether to continue treatment.

Unable to make the decision to change shifts, the mothers were **fatigued owing to multi-department visits to control the progression of the disease**, and they wondered how long this life would last. They felt **the pain of not being able to see a bright future**. They were **desperate for new treatment methods for MPS**. Simultaneously, they began **planning for when they could no longer provide support**, so that they would have peace of mind concerning their children’s futures.

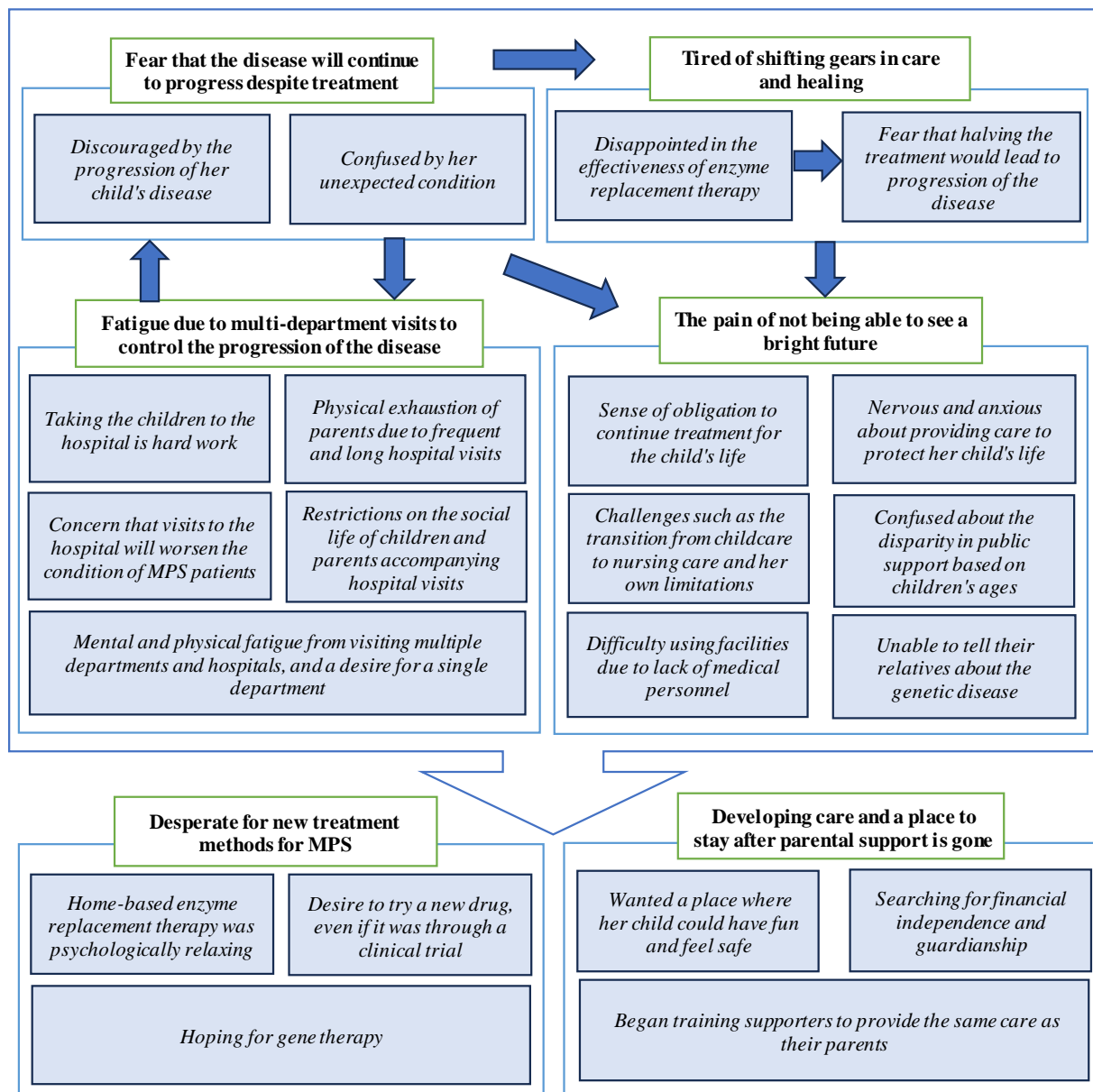


Figure 1. Relationship between categories regarding the experiences and challenges of mothers of adult patients with severe MPS

5. Discussion

The following six experiences were raised by mothers of adult patients with severe MPS: fear that the disease will continue to progress despite treatment, feeling tired of the shifting of gears in care and healing, fatigue due to multi-department visits to control the progression of the disease, the pain of not being able to see a bright future, desperation for new treatment methods for MPS, and worries about developing care and a place to stay after parental support is gone. The findings concerning fear that the disease will continue to progress despite treatment and fatigue due to multi-department visits to control the progression of the disease were similar to those found in previous studies⁴¹⁻⁴⁴.

Two new findings were that mothers were tired of shifting gears in care and healing and the pain of not being able to see a bright future. MPS is an incurable disease, and the only treatment method is enzyme replacement therapy. It is completely understandable that it is unclear how effective this treatment is, and that there is concern that patients' condition will worsen after years of careful care. Contrastingly, the subcategories "*the transition from childcare to nursing care and their own limitations*" indicates that continuing the current care is a heavy burden for mothers. In Japan, home enzyme replacement therapy became possible for MPS I, II, IV, and VI in 2021⁴⁵⁾. The introduction of home medical care may lead to a reduced burden on mothers. In addition, guidelines concerning enzyme replacement therapy are required. Further, mothers were desperate for new treatment methods for MPS, such as gene therapy. In Japan, the medical subsidy system changes dramatically after the age of 20 years, and pediatric medical care is no longer available. Previous research has shown that people are struggling with the reduction in medical subsidies, and it is hoped that financial support will be expanded for people with MPS, among others⁴⁶⁾. Concurrently, it is necessary to provide care and a place to stay for patients after parental support is gone. Several studies have noted the problems faced by people with disabilities after the death of a parent⁴⁷⁻⁵²⁾.

A unique challenge for patients with MPS is the need for lifelong enzyme replacement therapy. There is an urgent need to create a system that allows patients with severe MPS to receive enzyme replacement therapy for the rest of their lives, even after their parents have passed away. It is desirable to expand facilities that provide medical care for seriously ill community-dwelling patients. In addition, it is hoped that coordinators, community health nurses, and consultation support staff will work together to provide continuous support for patients with MPS after the death of a parent to foster patients' independence as much as possible.

6. Conclusion

We identified six categories based on the experiences of Japanese mothers of adults with severe MPS. Even without the support of the mother, the patient wanted enzyme replacement therapy for life, and the development of a new treatment was the only hope. We believe that some of these results are a common issue not only for MPS patients but also for patients with progressive rare and intractable diseases that have no established fundamental treatments. Medical and welfare professionals must work together to provide support to patients with advanced rare and incurable diseases so that they do not lose their will to live.

6.1. Limitations and future challenges

This study targeted mothers of adults with severe MPS, but the demographics of the subjects were inconsistent, and the overall picture could not be presented. To make a generalization, it is necessary to increase the number of subjects for other rare hereditary diseases, consider family backgrounds, and so on to find commonalities and differences, and obtain suggestions for better support.

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Conflict of interest

None.

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ORIGINAL ARTICLE

Working and Living Conditions of Interstate Migrant Workers during Pre- and Post-COVID-19

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ABSTRACT

The imposition of lockdowns in several nations has resulted in restricted movement of an individual, leading to a mobility crisis in India. As migrant labourers strived to make their way back home, it led to certain confrontations with relief policies, law enforcement, and transit policies being enforced. Interstate migrant workers in India have been facing a myriad of challenges in this accord and are predominantly engulfed with sociological, psychological, economic, political, and legal dimensions. This research article examines their pre- and post-COVID-19 living and working conditions, focusing on the diverse migrant population residing in Kelakottaiyur. The objective of this study is to understand the working and living conditions of the migrants in correspondence with the diversity prevailing within. It can be further validated in terms of employing a convenience sampling method in juxtaposing potential selection bias and self-reporting (or) recall bias. According to the findings of the study, the circumstances under which migrant labourers work have a significant impact on their overall quality of life. Specifically, their living conditions, job satisfaction, and socio-economic status are all prejudiced by the nature of their employment. This study aims to prove that Interstate migrant workers in India are vulnerable in terms of mobility, health, and well-being, by elucidating a comparative analysis between their respective professions and livelihood, during the Pre- and Post-COVID-19. Furthermore, it underscores the importance of creating fair and supportive working environments for all individuals, regardless of their background or status.

Keywords: Pre-COVID-19, mobility, living conditions, working conditions, Post-COVID-19

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1. Introduction

The term "Human Migration" refers to people moving from one place to another, either temporarily or permanently, for various reasons. India is a prominent example of a country shaped by migration dynamics, with internal and international migration. The term "migration" is ambiguous, with various definitions used worldwide¹⁸⁾. According to S.K. Das, migration is "a process of movement of an individual from his place of birth to a new place of residence"⁹⁾, while it can also refer to travelling for work or crossing specific boundaries. Social scientists have highlighted the social and cultural effects of migration. According to the United Nations Multilingual Demographic Dictionary (1958), migration is "a form of spatial or geographical movement between one geographical region and another," involving a change in residence from the place of origin or departure to the place of destination or arrival²²⁾. According to the International Labor Organization (ILO), a "migrant worker" is someone who moves from one country to another in search of employment with someone other than themselves²⁴⁾. This definition imbibed individuals who are regularly admitted as migrant workers. Migration for work has happened mostly for economic reasons, and in particular, male migrants in the majority, moved across states for the same. The Inter-State Migrant Workmen Act of 1979 defines an interstate migrant worker or labourer as "any person who is recruited by or through a contractor in any state under an agreement or other arrangement for employment in an establishment in another state, whether with or without the knowledge of the person being employed"¹³⁾. In modern times, labour migration has become a global phenomenon due to the growth of transportation and communication. The movement of workers into industrializing areas has widened the gap between rural and urban communities⁹⁾. This has resulted in the collapse of livelihoods in India's rural areas, forcing people to leave their hometowns in search of work.

According to the Indian Census of 2011, approximately 450 million people migrated domestically within India, which can be considered a 45% increase from the 2001 Census³⁾. Of these, there are approximately 60 million interstate migrants reckoned in India, and an average of 9 million migrants are expected to move across states each year between 2011 and 2019. Additionally, around 175 million migrants work in India's informal economy, according to the Economic Survey of India (2017). The major source states for these migrant workers are Assam, Bihar, Jharkhand, Odisha, Uttar Pradesh, and West Bengal, while the leading destination states are Delhi, Kerala, Maharashtra, Gujarat, and Tamil Nadu¹⁷⁾. According to the 2011 census, migration in India took place between rural and urban areas (47.4%), urban and rural areas (22.6%), rural and urban areas (22.1%), and urban to rural areas (7.9%). There has been an increase in rural-urban migration due to poverty in rural areas, rapid industrialization, a desire for upward economic mobility, and an attraction to urban culture.

There are two factors that influence people to migrate - push factors and pull factors. Push factors are the reasons that force someone to leave their area of origin and move to another location due to lack of work opportunities, unemployment, poor economic conditions, poverty, high population pressure on the land, low agricultural productivity, etc. Pull factors refer to the factors that entice individuals to relocate from one place to another, such as job opportunities, higher education prospects, better working conditions, access to consistent employment, and improved healthcare facilities. In India, individuals from Assam, Bihar, Jharkhand, Odisha, Uttar Pradesh, and Madhya Pradesh migrate to Punjab, Haryana, and Western Uttar Pradesh for agricultural purposes. Employment is a major driving force behind rural-to-urban migration, as rural communities with an agricultural-based economy often lack employment opportunities⁹⁾. Conversely, urban areas offer diverse employment opportunities in industries such as transportation, services, and trade. The decision to migrate is influenced by a variety of factors that affect individual choices as it depends on both their living and working conditions. Living conditions refer to a person's access to basic necessities such as clean water, food, clothing, shelter, and safety. It is

crucial for a person's well-being and can also be referred to as "conditions for life," encompassing access to electricity, a suitable habitat, and other necessities. Quality of life and living conditions are interconnected concepts that affect how people live. Working conditions, on the other hand, include aspects of an employee's employment terms and conditions, as well as the environment in which they work. The physical, social, and psychological features of the workplace all contribute to work conditions, which can affect an employee's performance, health, safety, and work-life balance⁶⁾.

Migrant workers, especially those in low-paying jobs such as wage employees and casual labourers in the manufacturing and construction industries, often face poor living and working conditions. The challenges faced by migrant labourers begin with finding a place to live and extend to concerns about safety and health. To cut down on living expenses, these labourers often reside in cramped and unsanitary housing conditions⁹⁾. This can lead to poor eating habits and hygiene practices, placing them in precarious living situations as they attempt to minimize costs in the state they have migrated to. Migrant workers may also find themselves in vulnerable situations due to a range of factors, including the circumstances that forced them to return to their home state, difficulties encountered during travel or upon arrival, and personal characteristics such as age, gender identity, race, disability, or health status²³⁾. A closer look at migrant workers' occupations reveals that, apart from farmers and agricultural labourers, most men work in production-related activities. In the tertiary sector, male migrants are mostly employed in sales positions, followed by clerical and related professions. In a nutshell, migrant workers contribute significantly to India's economy in industries such as small-scale manufacturing, hospitality, textiles, fisheries, and construction⁴⁾.

On March 25, 2020, India imposed a strict national lockdown and sealed all borders immediately after the announcement. The impact on India's migrant workers as a result of the unexpected announcement of a statewide lockdown stunned both domestic and foreign migrant workers who were ready for this¹⁹⁾. This is one of the largest issues India has encountered in the current crisis and the country has been facing a growing crisis as a result of the abrupt announcement of a statewide lockdown⁴⁾. A sizable proportion of India's workforce has been employed in informal employment and constitutes migrant labourers. The majority of the workforce in India is made up of migrant labourers who work in the unorganized sector. The total number of domestic migrants in India in 2011 was expected to be a startling 139 million by taking inter- and intra-state travel into account. The mistreatment of the migrant situation during this lockdown might result in many starving deaths, destitution, and poverty for poor persons who are left stranded away from their families. The broken economy would cause long-term pain for the lower-middle and lowest-income groups. The present pandemic has highlighted the poor situation of migrant workers in public conversation. Therefore, a change in policy is urgently required to improve their circumstances¹⁴⁾.

As a part of this research study, we will be analysing previous research on migration, considering working and living conditions, as well as the pandemic. Using data from the Kerala Migration Survey of 2011, the author¹⁾ investigated the impact of the international diaspora on the occupational mobility of workers during three stages of labour migration: emigration, pre-emigration, and post-return. The study utilized a sample of 2913 return migrants and compared their sociodemographic traits and occupational profiles with those of emigrants. The majority of migrant workers in Kerala work in the informal construction industry, enduring long hours and poor working conditions with little legal protection. It is crucial to ensure that migrants and their families have good access to services and entitlements outlined in policies and laws, while also ensuring that urban areas are inclusive. The COVID-19 pandemic¹⁰⁾ has affected migrants, and international organizations have published reports on the impact of remittances and policy suggestions for the way forward.

The study highlights the problems faced by impoverished migrants due to mass unemployment and the unprotected, precarious jobs that define the labour market. The author suggests that cross-disciplinary researchers address issues by measuring migrant workers' rights violations and the use of business practices to circumvent those rights. Furthermore, an increase in short-term and return migrants calls for new approaches to estimating urban growth and migration¹¹⁾. This study¹²⁾ can be expanded in terms of focusing on the human dignity of marginalized people in a modern welfare state, with respect to female inter-state migrants. However, out-migration from Kerala is not included. The research based on 2011 can be regarded as appropriate for the succeeding stages because migrants and sending in both rounds share similar socioeconomic and demographic characteristics. The findings showed that migrants have returned back to their homes, because of unfavourable working conditions, bad health, or were forcibly sent home. The study also revealed that Kerala emigrants lacked access to good jobs and were extremely vulnerable.

Aishvarya (n.d.) analyzed the quality of life among respondents depending on their working conditions. Based on the 2016 Indian census, every third Indian was a migrant, and the migrant population of Tamil Nadu had increased by 98%. Results showed that respondents with better working conditions reported a moderate level of quality of life, education, and income²⁾. As the predicament of working conditions improved, the respondent's quality of life declined. Therefore, the state's growing migrant population, primarily from the north, had caused a slew of issues, including language barriers and inadequate housing. Migrant workers were underpaid and forced to live in poor conditions, experienced prejudice, and resided in substandard housing. The study collected data from 50 migrant workers in the Sular area, using a simple random sampling and probability sampling type. It intended to draw attention to the issues experienced by migrants who work in Tamil Nadu's manufacturing sectors, particularly in Sular, to improve their working conditions and the general welfare of people and societies. The United Nations estimated that there were more than 258 million immigrants globally, and the number is growing. India has been ranked 12th with 5.2 million immigrants.

An analysis of the Census of India, 2001 data³⁾ conducted in 13 Indian cities, including Delhi, Mumbai, Kolkata, Bangalore, Hyderabad, Jaipur, Lucknow, Vishakapatnam, Ludhiana, Nasik, Aligarh, Bhubaneswar, and Imphal, revealed that the poorest states contributed significantly to migration flows in the Indian context. The study found that the highest number of people migrated to improve their livelihoods. However, migrant workers are still employed as casual slum labourers with low-paying and low-earning jobs in the informal sector. The informal and contractual nature of work exposes these vulnerable migrants to different deprivations and handicaps, which are related to the structure of municipal policy and the absence of employer support. Poor slum migrants have lower levels of educational achievement, lower social class affiliation, and lower economic position, all of which are interconnected. This study exposed the poor living conditions and lack of public services faced by migrant workers in Indian cities⁴⁾.

Furthermore, there's another study⁵⁾ which investigated moderate to severe depressive signs seen in rural-to-urban migration; it found no evidence of more depression indicators when compared to rural and urban inhabitants. The author⁷⁾ discovered that the rural economy of Odisha has been encountering an abrupt increase in labour supply on a significant scale. But the main issue faced by migrants is losing their jobs, followed by losing their money. It also implicated that the sort of job, household income without migrants, and migrant workers' income all significantly affect how vulnerable migrants are⁸⁾. The workers are employed in low-productivity positions with low salaries and pay their labour without job safety, medical health, or social safety benefits. All of this deteriorates the workers' living and working conditions. Even though they work and live in one of the most developed areas of the country, they are financially excluded and neglected.

The analysis in this study concludes that construction activities are integral to the development of any economy. These activities provide significant employment opportunities for unskilled labourers, particularly those from socially and economically disadvantaged backgrounds.

The information¹⁶⁾ was gathered from slum inhabitants in three Indian states: the National Capital Territory of Delhi, as well as two towns in the National Capital Regions of Haryana and Uttar Pradesh. Low-skilled workers in Delhi's suburbs and Gurgaon were further interviewed, which results in highlighting their struggle to support their families in urban areas despite earning more than they would in rural areas, where employment opportunities are scarce. The paper concludes that labour migrants have a significant impact on contemporary Gurgaon's development. Another study was conducted¹⁷⁾ on the prevalence of depressive symptoms among rural to urban migrants within Kerala, and it was found that there was no significant difference compared to rural and urban residents. The study¹⁸⁾ used secondary information on interstate labour migration to Kerala and welfare initiatives implemented by the Kerala government to improve the social security, health, and living standards of migrant workers. It was discovered²⁰⁾ that severe psychological disorders such as anxiety, post-traumatic stress disorder, and psychotic disorders were more common among migrant workers due to factors such as discrimination, family separation, and loss of social standing. The research also identified developing disorders such as depressive syndrome, anxiety, alcohol or substance misuse, and poor sleep quality. These disorders are caused by poor living conditions, social exclusion, demanding work, and verbal or physical abuse. Furthermore, the author has also thoroughly examined the migrant labourers' conditions regarding gender, mental health, and social security provisions.

Occupational medicine must play a vital role in promoting the well-being of migrant workers. Another study²⁷⁾ scrutinizing the hygiene of migrant workers, also found that harmful alcohol and cigarette use was prevalent among young, single male migrant construction workers in Bangalore, who had poor physical, social, and psychological quality of life. It results in providing suggestive measures to enhance the physical, social, and psychological health of this vulnerable population with the help of stringent laws. Policymakers should consider factors such as documentation status, access to health insurance, safe working conditions, and labour union membership when determining access to and quality of healthcare services for labour migrants²¹⁾.

Research on migration has clarified different aspects of it, but there are still gaps in our knowledge. Previous studies have looked at areas like the kinds of jobs migrants have, how it affects their quality of life, and the difficulties they face. However, we need a more complete understanding of the experiences of Indian migrant workers as they are victimized on the basis of discrimination and exploitation on a daily basis²⁵⁾. Not only do they experience prejudice and exploitation in the state where they work, but they also face discrimination based on their social class and background in their own country. This situation raises concerns about human dignity and the mistreatment of fellow human beings. Despite international conventions and the Indian Constitution guaranteeing the rights of migrant workers to live with dignity and be considered citizens, they often do not receive the respect they deserve²⁶⁾. Therefore, there is still a void existing in researching the vulnerability and cruciality faced by migrant workers in India. Nonetheless, the unforeseen outbreak of the pandemic and its repercussions have illuminated a new perspective on the lives of India's migrant labourers. Furthermore, some have resorted to desperate measures to return home, leading to conflicts with law enforcement and the introduction of last-minute transportation solutions. Like how COVID-19 has spread, the Gulf economy also collapsed, trapping migrant workers without a means of support, making them anxious to return to India by providing them with secure accommodation or food²⁷⁾. A "crisis inside a crisis" resulted from an absence of government planning to safeguard the welfare of migrant labourers

both inside and outside of India¹⁴⁾. So, this study examines the working and living conditions of interstate migrant workers, particularly those in the manufacturing and construction industries in Keelakottaiyur, Chengalpet, Tamil Nadu, both before and after COVID-19.

This research also aims to fill that gap by exploring the intricate dynamics of their lives, by examining everything from their reasons for migrating to the challenges they face in their living and working conditions. Our goal is to analyze the complex factors that influence migration, the difficulties migrants encounter, and the weaknesses in the system they face, to make a valuable contribution to the conversation about the experiences of migrant workers. Our study aims to provide a complete understanding of the obstacles and possibilities that come with migration, to inform policies that can improve the living and working conditions of migrant workers. In the following sections, we will explore the various aspects of migrant workers' experiences, including their motivations for migrating, the conditions they face, their vulnerabilities, and the difficulties presented by the COVID-19 pandemic. Our goal in this analysis is to offer a more nuanced understanding of the lives of migrant workers and to contribute to the ongoing conversation about social fairness and justice.

Understanding the reasons behind migration is essential, and a theoretical framework would serve as a valuable tool for this purpose. In this study, we use the 'Dual Labor Market Theory' to examine the disparities that arise in the working and living conditions of migrant workers who move between states. This theory highlights the existence of a segmented labour market where migrant workers often find themselves stuck in a secondary labour market with unstable employment, low wages, and inadequate access to necessary social protections. By using this theoretical perspective, our aim is not only to comprehend these inequalities but also to suggest policy solutions to address them. Specifically, this study delves into the complex phenomenon of human migration, focusing on the challenges, conditions, and vulnerabilities that migrant workers face in India's dynamic landscape.

1.1. Originality of the Study

This study is noteworthy due to its extensive analysis of interstate migrant workers in Kelakottaiyur (Tamil Nadu), focusing on the living and working conditions of the migrants, both before and after the onset of the COVID-19 pandemic. It also focuses on the challenges faced by migrant workers in India, with a particular emphasis on the impact of a worldwide health crisis on their daily lives. The study aims to hypothesize the factors of economical variances existing between the developed and the developing states in India, working and living conditions attributed for migrant workers, and the varied elements of migrant livelihoods. The lack of statutory protections and the ambiguity surrounding the post-pandemic era can be identified as the resultant manifestations of the investigation. The current analysis provides valuable insights that could potentially contribute to the development of policies and decision-making processes aimed at improving the welfare of migrant workers in India. The locus of this research study is bordered around the outskirts of Chennai, a city renowned for its heterogeneous migrant population. The objective of this study is to offer a comprehensive and pertinent examination of the obstacles encountered by migrant labourers who relocate inside the confines of this urban region.

The focal point on the particular geographical area enables a thorough and advanced understanding of the challenges individuals encounter within a specific socio-economic context, which is a crucial factor in identifying effective approaches to improve their conditions. Moreover, the primary objective of this study is to investigate the living and working conditions encountered by migrant workers prior to and subsequent to the initiation of the COVID-19 pandemic. This approach provides a valuable comparative examination of the effects experienced by people in response to unforeseen global

occurrences, such as a pandemic. Subsequently, this analysis offers valuable perspectives on the potential changes in their conditions, whether they have experienced improvement, decline, or stability in response to the given circumstances. The chosen study methodology exhibits a multidisciplinary approach, with the objective of addressing many societal, psychological, economic, political, and legal challenges commonly encountered by migrant workers. The comprehensive examination of the intricate and interconnected challenges encountered by migrant workers in this extensive study holds particular importance due to its departure from a simplistic viewpoint. The research findings suggest a lack of adequate legal protections for migrant workers who are not involved in formal employment. This study also addresses a notable gap in the current legal framework and provides unique perspectives on the consequences of the pandemic on the interstate migrant workforce. This study analyzes regulations and conditions for interstate migrant workers in India, specifically those in the construction and industrial sectors, including those in Keelakottaiyur. It explores living and working conditions and potential psychological trauma. The findings can offer policy suggestions to support these workers.

2. Objectives

Interstate migrant workers face several challenges, including sociological, psychological, economic, political, and legal concerns. These workers are distributed in a dispersed and unorganized manner with limited negotiating power. Migrant workers suffer the most because of their lack of organization and literacy, as they are unable to take advantage of the provisions of the several labor laws that apply to them. Another key issue is the lack of effective legal protection, an insufficient legal framework, and procedure. Migrant workers may not have a formal employer-employee relationship in their workplaces. In such cases, employment is the key motivator for interstate migration, and construction is India's second-largest employer after agriculture. Modernization, industrialization, and globalization have all helped the building industry²⁷⁾. Chennai's diverse nature comes from its attraction to migrant groups from across India. Recently, there has been increasing interest in the hardships and challenges faced by migrant workers who move between states, as studied by researchers, social workers, and the media. As a result, the current study examines interstate migrant workers with a focus on their living and working environments during the pre-and post-COVID-19. The objectives of this research are as follows:

1. To understand the nature of work performed by migrant workers.
2. To analyze the living environment of migrant workers.

3. Methodology

This study employs both descriptive and analytical approaches and draws from a sample of 150 migrant workers in Keelakottaiyur through convenience sampling. Its focus is on working and living conditions as dependent variables, with socio-demographic, economic, religion, marital status, caste, age, gender, and education as independent variables. Frequency tables and cross-tabulations are utilized for data analysis, facilitated by SPSS version 25.0. However, the use of convenience sampling may introduce selection bias, and self-reporting and recall bias could affect the accuracy of the responses received. The data has been collected from January 2020 to October 2022 and provides valuable insights into the challenges faced by migrant workers. The Dual Labor Market Theory highlights significant disparities in the working and living conditions of interstate migrant workers who are limited to the secondary labour market, with precarious employment and low wages. The study has adapted a questionnaire to align with its research goals through interviews, observations, and discussions. The research aims to understand migrant workers' roles, conditions, wages, and challenges,

alongside assessing their living conditions, including housing, amenities, safety, and their impact on well-being. The results obtained can highlight migrant workers' contributions and areas for improvement while upholding their rights to safe living conditions. Ethical considerations were central to the study, with informed consent obtained from all participants, ensuring ethical integrity. The primary outcome of this study relies in obtaining a comprehensive understanding of the work performed by migrant workers. This would involve documenting their job roles, industries, working conditions, wages, and challenges faced in their work. The study also seeks to analyze the living conditions and environment in which migrant workers reside. This includes assessing housing quality, affordability, access to basic amenities, social infrastructure, safety, and how these conditions impact their well-being. The results of the study could provide insights into the contribution of migrant workers to various sectors, identify areas for improvement, and help ensure their rights to safe and decent living conditions are upheld.

4. Results

Table 1. SOCIO-DEMOGRAPHIC FACTORS OF THE RESPONDENTS

Demographic Factors	No. of respondents	Percentage
Gender		
Male (%)	94	62.7
Female (%)	56	37.3
Education Level		
5-9 (%)	15	10.0
10-12 (%)	122	81.3
UG (%)	13	8.7
Occupation		
Carpenter (%)	12	8.0
Electrical (%)	6	4.0
Machine Operator (%)	58	38.7
Mason (%)	3	2.0
Packing (%)	35	23.3
Polishing (%)	36	24.0
Native Place of the Respondents		
Assam (%)	25	16.7
Bihar (%)	62	41.3
Jharkhand (%)	9	6.0
Odisha (%)	33	22.0
Uttar Pradesh (%)	9	6.0
West Bengal (%)	12	8.0
Religion		
Hindu (%)	120	80.0
Christian (%)	3	2.0
Muslim (%)	27	18.0
Caste		
OC (%)	9	6.0
BC (%)	72	48.0
SC (%)	69	46.0
Marital Status		
Married (%)	57	38.0
Unmarried (%)	93	62.0
Family Types		
Nuclear (%)	120	80.0
Joint (%)	30	20.0

4.1. Socio-Demographic Characteristics

According to Table 1, the majority (62.7%) of migrant workers were men while 37.3% were women, indicating a gender imbalance. The labour market favoured men, with 62.7% of male migrants occupying key positions due to cultural biases that cast men as the breadwinners. Meanwhile, women were relegated to secondary earning roles, despite their significance in migration. The COVID-19 pandemic affected both male and female migrant workers, causing a decline in wages and increased discrimination in terms of employment and care responsibilities. Salary reductions led to changes in employment, with men receiving more pay and benefits compared to women as migrant labourers. Additionally, men enjoyed better living conditions, which highlights an unequal resource allocation.

According to the data, it appears that a significant percentage of migrant workers, roughly 81.3%, have received education up to levels 10-12. Within this group, 10% had completed only primary education while 8.7% held degrees. Furthermore, 83% of migrant employees had completed only secondary education. This indicates that many migrant workers possess limited skills due to their inadequate education, which leads to lower-paying jobs. Consequently, a substantial number of these workers are compensated on a daily basis, given their lower levels of higher education.

The survey data showed that migrant workers were mainly employed in the construction and manufacturing industries. Within the manufacturing industry, the majority of respondents (38.7%) were machine operators. Workers in polishing sections accounted for 24% of the sample, while those in packing units made up 23.3%. Carpenters made up 8% of the construction labour force, while electricians and masons represented 4% and 2%, respectively. It was noted that some graduated migrants ended up recruiting themselves in manual labour jobs due to limited work prospects in their area. The study showed a clear link between workers' education and their job preferences.

It is conspicuous to note that a majority of the migrant labourers in various states of India, particularly from the northern part of the country, hail from Bihar (41.3%); Odisha and Assam account for 22% and 16.7% respectively, while Jharkhand and Uttar Pradesh make up 12% and West Bengal 8%. These labourers migrate in search of better job prospects and access to food resources. To navigate the metropolitan job market, they rely on a vast social media network that includes contractors, middlemen, family, and friends. Labour contractors play a critical role in helping them secure organized sector jobs by providing transportation, food, and compensation during the migration period. It's worth noting that 41.3% of migrant labourers in Chennai are from Bihar, and they are mostly concentrated in Keelakottaiyur. Hence, this study examines their living conditions, including their accommodation, residence types, access to amenities, and quality of healthcare (accounts for the majority of the migrants in Chennai).

Obviously, religion emerged as a major determinant in shaping social inequalities among migratory populations. The analysis of religious affiliation indicated that a significant majority, accounting for 80% of them, identified as respondents of Hinduism, while Muslims constituted 18% of the population. The presence of Hindu migrants in the research area's population was notably prominent.

Moreover, the demographics of the migrants showed obvious caste distinctions. The Other Backward Classes (OBC) accounted for a significant proportion of 48%, with the Scheduled Castes (SC) making up 46%. The remaining 6% were classified as belonging to the Open Category. The observed variation in caste distribution within the migrant labour force was of particular significance. Nevertheless, it is necessary to recognize that individuals from Other Backward Classes (OBC) and Scheduled Castes (SC) encountered significant obstacles characterized by socioeconomic disparities and elevated levels of unemployment among the migratory inhabitants.

It is noteworthy that the marital status of migrant respondents was examined to assess socioeconomic situations. According to the study, 62% of all respondents were single, while 38% were married.

Subsequently, in terms of family types among migrant workers, approximately 80% belonged to nuclear families, while the remaining 20% belonged to joint families. The working and living conditions of nuclear families, in comparison to joint families, presented distinct advantages and disadvantages. While nuclear families offered greater independence, they also posed potential challenges related to safety and homesickness.

Table 2. OCCUPATIONAL BASED SALARY OF MIGRANT WORKERS

Sectors	Occupation	Salary Before COVID			Salary Post COVID			Total No. of Respondents
		₹ 10001-15000	₹ 15001-20000	Above ₹ 20000	₹ 10001-15000	₹ 15001-20000	Above ₹ 20000	
Constr uction	Carpenter	5 (41.7%)	4(33.3%)	3(25.0%)	11 (91.7%)	0(0.0%)	1(8.3%)	12
	Electrical	3(50.0%)	0(0.0%)	3(50.0%)	4(66.7%)	1(16.7%)	1(16.7%)	6
	Mason	1(33.3%)	2(66.7%)	0(0.0%)	3(100.0%)	0(0.0%)	0(0.0%)	3
Manufact uring	Machine Operator	37(63.8%)	18(31.0%)	3(5.2%)	55(94.8%)	2(3.4%)	1(1.7%)	58
	Packing	30(85.7%)	5(14.3%)	0(0.0%)	33(94.3%)	1(2.9%)	1(2.9%)	35
	Polishing	29(80.6%)	4(11.1%)	3(8.3%)	33(91.7%)	1(2.8%)	2(5.6%)	36
	Total	105(70.0%)	33(22.0%)	12(8.0%)	139(92.7%)	5(3.3%)	6(4.0%)	150

4.2. Occupational based Salary of Migrant Workers

The results shown in Table 2, the salary range of migrant workers before and after COVID was highest in Packing (85.7%), followed by Polishing (80.6%), Machine Operator (63.8%), Carpenter (41.7%), Electrical (50.0%), and Mason (33.3%), all of which fell within the ₹10,001- ₹15,000 range before COVID. Machine Operator (94.8%), Packing (94.3%), Polishing (91.7%), Carpenter (91.7%), Electrical (55.0%), and Mason (100%) on the other hand, accounted for the ₹10,001- ₹15,000-range during the post-COVID.

It is evidently shown that the migrant employees were paid before and after the COVID-19 pandemic. The data was categorized by occupation and sector. Nevertheless, in the construction sector, 41.7% of those earning between ₹10,001 to ₹15,000 were carpenters and 50.0% were electrical workers. Masons made up (33.3%) of ₹10,001 to ₹15,000 people. Carpenters' incomes increased after the COVID-19 epidemic, with 91.7% earning between ₹10,001 - ₹15,000. Electrical workers also had a large percentage (66.7%) in this pay group. Masons earned 100% between ₹10,001 and ₹15,000.

Whereas in the manufacturing industry, 63.8% of machine operators earned between ₹10,001 to ₹15,000. Additionally, 85.7% and 80.6% of packaging and polishing workers earned the same income group. After the COVID-19 epidemic, machine operators had a (94.8%) income distribution between ₹10,001 to ₹15,000. Packing workers had a 94.3% distribution and polishing workers (91.7%) within the same pay range. According to the data, the COVID-19 pandemic has affected the pay range of migrant workers, resulting in a significant increase in the proportion of people earning between ₹10,001 and ₹15,000 before the pandemic.

Table 3. RELATIONSHIP WITH THE EMPLOYER IN TERMS OF PRE- AND POST-COVID-19 (SATISFACTORY LEVEL)

Sectors	Occupation	Relationship with Employer Pre-COVID-19 Satisfactory level			Relationship with Employer Post-COVID -19 Satisfactory level			Total No. of Respondents
		Satisfied	Moderate	Poor	Satisfied	Moderate	Poor	
Construction	Carpenter	9(75.0%)	3(25.0%)	0	9(75.0%)	3(25.0%)	0	12
	Electrical	3(50.0%)	3(50.0%)	0	0	3(50.0%)	3(50.0%)	6
	Mason	0	3(100.0%)	0	3(100.0%)	0	0	3
Manufacturing	Machine Operator	36(62.1%)	22(37.9%)	0	25(43.1%)	21(36.2%)	12(20.7%)	58
	Packing	12(34.3%)	23(65.7%)	0	15(42.9%)	11(31.4%)	9(25.7%)	35
	Polishing	18(50.0%)	18(50.0%)	0	18(50.0%)	12(33.3%)	6(16.7%)	36
	Total	78(52.0%)	72(48.0%)	0	70(46.7%)	50(33.3%)	30(20.0%)	150

4.3. Relationship with the Employer in terms of Pre- and Post- COVID-19

Table 3 exhibits a complete illustration of the correlation between migrant workers and their employers, both prior to and subsequently to the outbreak of the COVID-19 pandemic. The data is organized based on several occupational groups.

It is obvious that prior to the emergence of the COVID-19 pandemic, especially in the case of the Construction Sector, Carpenters had a notably high level of job satisfaction in their relationships with employers, as seen by a significant (75%) of individuals reporting contentment. Electrical labourers exhibited a satisfaction rate of (50%). Interestingly, prior to the onset of the COVID-19 pandemic, individuals belonging to the Masons organization did not report any instances of being content with their employers. Subsequently after the COVID-19 pandemic, a notable and favourable transformation occurred in the dynamics between Masons and their employers, as evidenced by a unanimous 100% rating of satisfaction. The carpenters exhibited a consistent degree of satisfaction, as evidenced by their sustained rate of 75%. Regrettably, the level of satisfaction among electrical workers was found to be unsatisfactory since none of the respondents reported any level of satisfaction.

It is clear in the manufacturing sector, prior to COVID-19, the occupation of Machine Operators exhibited a satisfaction rate of 62.1%. The Polishing labourers exhibited a satisfaction rate of 50%. The packing workers indicated a reduced level of satisfaction, with a percentage of 34.3%. Likewise, after the COVID-19 pandemic, the group of polishing workers and machine operators indicated a satisfaction rate of 50%. The satisfaction rate among packing workers showed a little increase, as 42% of respondents reported being satisfied.

Table 4. MIGRANT WORKERS ACQUIRING FACILITIES DURING THE PRE- AND POST-COVID-19, RELATED TO OCCUPATION

Sectors	Occupation	Facilities acquired in Pre-COVID-19 Satisfactory level		Facilities acquired in Post-COVID-19 - Satisfactory level			
		Yes	No	Satisfied	Moderate	Poor	Total No. of Respondents
Construction	Carpenter	12(100.0%)	0(0.0%)	9(75.0%)	3(25.0%)	0	12
	Electrical	6(100.0%)	0(0.0%)	3(50.0%)	3(50.0%)	0	6
	Mason	0(0.0%)	3(100.0%)	3(100.0)	0	0	3
Manufacturing	Machine Operator	49(84.5%)	9(15.5%)	37(63.8%)	18(31.0%)	3(5.2%)	58
	Packing	29(82.9%)	6(17.1%)	17(48.6%)	12(34.3%)	6(17.1%)	35
	Polishing	33(91.7%)	3(8.3%)	12(33.3%)	21(58.3%)	3(8.3%)	36
	Total	78(52.0%)	72(48.0%)	81(54.0%)	57(38.0%)	12(8.0%)	150

4.4. Migrant Workers acquiring facilities during Pre- and Post-COVID-19

Table 4 illustrates the percentage distribution of migrant workers depending on their principal occupations, differentiating the periods before and after the COVID-19 epidemic. Notably, carpenters and electricians dominated both the building and manufacturing industries, accounting for 100% of the workers in each. Polishing employees were close behind at 91.7%, with machine operators, packing workers, and masons accounting for 84.5%, 82.9%, and 0% of facility access, respectively.

Prior to the pandemic, these percentages reflected the job circumstances. Nevertheless, there was a considerable shift in these values following the pandemic. Masons underwent a total overhaul, with 100% of employees getting access to facilities. Carpenters had a 75% rate of facility access, whereas machine operators, electrical employees, packing workers, and polishing workers had rates of 63.8%, 50%, 48.6%, and 33%, respectively.

Table 4 presents a clear picture of the percentage distribution of migrant workers across various principal occupations, comparing the periods before and after the COVID-19 pandemic. Several key points can be derived from this data: Carpenters and Electricians were the dominant occupational groups in both the construction and manufacturing sectors, each representing 100% of the workforce. This suggests that these two professions were vital and in high demand before the pandemic. Polishing workers were also significantly represented, with 91.7% access to facilities, indicating their prevalence in these industries. Machine operators and packing workers had moderate facility access percentages of 84.5% and 82.9%, respectively. However, it's noteworthy that masons had no access to facilities before the pandemic, suggesting a challenging work environment for this group.

In the ensuing pandemic, there was a substantial transformation in facility access percentages. Most notably, masons experienced a complete reversal, with 100% gaining access to facilities. This dramatic change suggests that the pandemic may have prompted positive changes in working conditions for masons. Carpenters, who initially had full access, maintained a 75% rate of facility access, indicating some changes in their situation post-pandemic but still a relatively favourable work environment. Machine operators, electrical employees, packing workers, and polishing workers all saw varying levels of facility access, ranging from 33% to 63.8%, post-pandemic. This suggests that the pandemic had a mixed impact on the facilities available to these occupational groups.

Overall, the data underscores the dynamic nature of employment conditions, particularly during and after significant

events like the COVID-19 pandemic. While some groups saw improvements in facility access, others experienced changes of varying degrees, highlighting the need for ongoing assessment and support to ensure the well-being of migrant workers across different occupational sectors.

5. Discussion

In this study, the 'Dual Labor Market Theory' has been employed to comprehensively assess the disparities in working and living conditions experienced by interstate migrant workers in India. This theoretical framework highlights the existence of a segmented labour market, wherein migrant workers often find themselves entrenched in a secondary labour market characterized by precarious employment, low wages, and inadequate access to crucial social protections. Our application of this theory not only aims to understand these disparities but also seeks to propose policy solutions to alleviate them. Specifically, this study delves into the intricate realm of human migration, with a focus on the myriad challenges, conditions, and vulnerabilities confronted by migrant workers within India's dynamic landscape.

5.1. Socio-Demographic Factors:

Living conditions for migrant workers, especially female workers facing unique challenges, emerge as a significant concern, and future dialogues should prioritize their improvement and support networks. The migration of men to different job sectors serves to expose the gender biases and societal norms that persist. According to the Dual-labour Market theory, the pervasive issue of gender inequality and stereotypes manifests in the form of occupational gender segregation, which refers to the phenomenon where men and women are disproportionately employed in different labour market segments. This segregation perpetuates and reinforces gender-based discrimination, limiting individuals' access to job opportunities and hindering their potential for professional growth and development. Although women migrants are a minority, they play a significant role in the migration process. It is crucial to acknowledge the contributions of women beyond their financial roles. Thus, strategies should be developed to recognize their efforts and promote their recognition. Migrant workers, regardless of their gender, are concerned about the effects of the pandemic. The discussion should focus on the ways to mitigate these effects, including closing the gender pay gap and providing more support for caregiving. The working conditions for male and female workers differ significantly, indicating gender inequality. Therefore, policies and strategies should be implemented to improve employment conditions and promote equal opportunities. The living conditions of migrant employees, particularly female workers facing unique challenges, are a significant concern. Thus, future dialogues should prioritize improving their living conditions and support networks.

Equal employment opportunities in rural areas depend on access to education. Migrant workers often have limited job options due to their secondary education, which tends to result in them being concentrated in lower-skilled occupations. Therefore, it is crucial to explore strategies that can improve education and its quality in their hometowns. From a critical perspective, the dual market labour theory can be applied to understand how educational opportunities and outcomes for migrants are influenced by their position within these labour markets, i.e., primary and secondary labour markets. Furthermore, in order to provide equal opportunities for employment in rural areas, access to education is crucial. The prevalence of migrant workers with only a secondary education suggests that this is a common issue. However, their limited education often results in them being employed in jobs that require lower skill levels. Migrants with limited access to quality education may have lower educational attainment, which can relegate them to the secondary labour market. As a

result, the labour force is concentrated in jobs with lower pay and limited room for growth. Moving to urban areas may have a negative impact on children's educational opportunities while changing attitudes towards education and increased prosperity may improve the quality of education in their hometowns.

Workers who migrate for employment often face difficult working conditions, including a lack of job opportunities and low pay, as well as instances of mistreatment in the workplace. From a theoretical perspective, this discussion can be explored by focusing on the challenging working conditions of migrant workers, especially those in the construction industry. Construction workers, in particular, are vulnerable in an unorganized labour market and often find themselves in deplorable situations. These workers often face precarious and exploitative situations, with low wages, long hours, and inadequate accommodations being prominent issues. They lack bargaining power, which makes it difficult for them to receive fair pay, and they often work long hours, exacerbating their already challenging circumstances. It's crucial to implement policies that safeguard labour rights and enhance their working conditions. Migrant workers and their families often live in poverty, and they may not fully understand the expenses of labour recruiting. The accommodations provided by their employers are often inadequate. Despite these challenges, migrant workers are often able to send money back to their families in their home countries, which can improve their overall standard of living. The impact of these remittances on regional growth is a topic of academic study.

In this discussion, we can analyze the noteworthy phenomenon of migration from states such as Bihar, Odisha, and Assam, including aspects such as economic prospects, causes that propel migration, and the role of social networks. Academic studies have explored the impact of remittances on regional growth, shedding light on the economic consequences of migration. This discussion can be expanded to examine the phenomenon of migration from specific Indian states, exploring economic prospects, migration drivers, and the role of social networks. The challenges faced by migrant workers in informal labour markets, as well as factors influencing recruiting and employment conditions, are also investigated theoretically. This study also investigated the difficulties encountered by migrant workers in informal labour marketplaces and explored the factors influencing recruiting and employment conditions. The concept of flexibility in migration might also be taken into consideration.

Migration patterns and socioeconomic circumstances are influenced by religion and caste, prompting further examination of their impact on opportunities, support systems, and economic achievements for migrants. The notable presence of Hindu migrants within the examined regions underscores the influence of religion as a determinant in both migration patterns and socioeconomic circumstances. This discourse has explored the factors behind the migration of specific caste groups, as well as the social and economic determinants that contribute to such phenomena. Moreover, it intrigues one to analyse the impact of caste prejudice and communal hierarchy on rural employment and urban migration.

According to statistical data, a significant number of individuals from Other Backward Classes (OBC) are employed in the manufacturing and construction sectors. Such discourse should perhaps delve deeper into this comprehension to gain a more comprehensive grasp of how caste impacts the vocational decisions and employment trends of migrant labourers. The examination of the intersectionality between caste and various aspects such as education, religion, and gender in the experiences and concerns of migrant workers can also be a subject of scholarly discourse. The application of a diverse methodology enables the comprehensive examination of the intricate dynamics associated with caste-based labour mobility.

It is conceivable that unmarried individuals are more likely to work in manufacturing than in construction, indicating an association between occupation and marital status. Young, unmarried high school graduates may find construction and

industrial work alluring due to its adaptability. According to the results of the survey, most respondents are unmarried and moved to urban areas to improve their quality of life. In turn, it highlights the significance of migration as an economic strategy, particularly for young unmarried individuals who seek better employment opportunities. This paper seeks to assess the degree to which the living conditions of unmarried migrant labourers correspond to the concept of bachelorhood. The difficulties of balancing work and family obligations in marital life can contribute to the relatively low representation of married individuals in certain occupational sectors. Understanding the marital status and the living situation could enlighten policies and assistance programmes for migrant labourers.

Furthermore, individuals who are not married tend to have more control over their work lives. When workers are separated from their families, they often work longer hours and earn higher wages, which can improve their living conditions. However, the traditional family structure is changing, especially for younger migrants, who are given more freedom. The well-being and job satisfaction of workers depend on the quality and adequacy of their housing. Studies show that people who live with family members, spouses, or children tend to have better overall health than those who live alone. Most employees prefer to live with their families, even if they are far away from their hometown. Many people form nuclear families because it is difficult to afford urban living and housing. Workers often share rental homes with their friends and family members. Migrating, whether alone or with family, is a complex and risky decision that can significantly affect the well-being of migrant workers.

5.2. Occupational based Salary of Migrant Workers

The COVID-19 pandemic has had a significant effect on the salary range of migrant workers, particularly in various sectors and occupations according to the primary and secondary labour markets in which they're respectively employed. Prior to the pandemic, the majority of migrant workers across different sectors and occupations earned salaries ranging from 10,000 to 15,000. Packing workers had the highest representation, followed by polishing workers. Machine operators, carpenters, electrical workers, and masons also had significant numbers falling within this salary range. However, after the pandemic, there was a remarkable shift in these salary distributions. In the Construction sector, carpenters and electrical workers saw significant increases in the number of individuals earning between 10,001 and 15,000. Masons achieved full representation within this salary range, indicating a substantial improvement in their income. In the Manufacturing sector, machine operators, packing workers, and polishing workers also experienced a notable increase in the number of individuals earning between 10,001 and 15,000. This shift in salary distribution is a clear indication that the COVID-19 pandemic had a significant impact on the income of migrant workers. The data suggests that more workers fell within the 10,001-15,000-salary range after the pandemic, signifying an improvement in their earning potential. This could be attributed to various factors such as increased demand for certain job roles, changes in labour policies, or adjustments made by employers to attract and retain workers during the pandemic.

5.3. Relationship with the Employer in terms of Pre- and Post- COVID-19

The COVID-19 pandemic had varying impacts on the job satisfaction of migrant workers depending on their occupation. Carpenters reported continued contentment with their employment, whereas electrical labourers experienced a decline in satisfaction, indicating potential challenges in their work environment or with their employer. Initially, masons reported low job satisfaction, but their perceptions shifted throughout the pandemic. In the manufacturing sector, machine operators

expressed contentment, while polishing labourers consistently reported high levels of satisfaction. Packing workers experienced lower job satisfaction, but there was a slight improvement after the pandemic. These findings underscore the importance of considering different occupations when evaluating the effect of the pandemic on the labour market. While some groups were able to adapt and persevere, others faced difficulties in their work environment and relationships with their employers.

5.4. Migrant Workers acquiring facilities during Pre- and Post-COVID-19

Through a substantial data analysis, carpenters and electrical workers had consistent access to facilities both before and after the COVID-19 outbreak, with a rate of 100%. This indicates that these industries maintained a steady level of facility access that was not affected by the pandemic. On the other hand, masons experienced a significant increase in facility access, going from 0% before the pandemic to 100% after. This suggests that changes in legislation or working conditions, possibly due to the epidemic, benefited this particular group of workers.

Before the COVID-19 epidemic, construction and manufacturing migrant employees reported being satisfied with their facility access. However, their satisfaction levels decreased when the pandemic began. This decline implies that while certain facilities were available, they may not have met the needs or expectations of workers in the post-COVID era. Overall, the data shows that the pandemic had a varied impact on different groups of migrant workers across various occupational categories. While some, like masons, made significant progress, others faced challenges in accessing sufficient facilities, resulting in overall dissatisfaction with their working and housing situations post-COVID.

The implementation of dual market theory within this study revolved around several crucial themes. First, it unveils the gender biases and societal norms exposed by the migration of men into different job sectors. Recognizing the contributions of women beyond their financial roles is imperative, and strategies should be developed to acknowledge and promote their recognition in the migration process. This discussion also emphasized the universal concerns of migrant workers, regardless of their gender, particularly in the context of the COVID-19 pandemic. Mitigating these effects includes closing the gender pay gap and providing enhanced support for caregiving responsibilities. Furthermore, this theory has evidently spotlighted the disparities in working conditions between male and female workers, underscoring the presence of gender inequality; In terms of living conditions, the influence of marital status on occupation has also emphasized the significance of approaching migration as an economic strategy for young unmarried individuals to seek improved employment opportunities. To address this, policies and strategies should be implemented to enhance employment conditions and foster equal opportunities.

6. Conclusion

Migration in India is linked to regional development disparities, with people moving from less developed to more developed states. Some highly developed states have high migration rates such as Delhi, Kerala, Maharashtra, Gujarat, and Tamil Nadu, whereas underdeveloped states like Assam, Bihar, Jharkhand, Odisha, Uttar Pradesh, and West Bengal experience significant out-migration. Rural-urban migration is common, but migrant workers often lack knowledge of their labour rights and work in the unorganized sector. COVID-19 has left many jobless and struggles for interstate migrant workers to access basic necessities. Our study examined the conditions of interstate migrant workers in Keelakottaiyur, Chengalpet District before and after COVID-19, focusing on their working and living situations. Thus, the study revealed the complex challenges faced by migrant workers in India during both periods. In a way, it aimed to achieve two objectives

using ‘dual-labour market theory’: to understand the type of working conditions of the migrant workers and to analyze their living environment. Prior to the pandemic, migrant workers in our study encountered relatively few issues in their working and living environments as they weren’t able to adapt to their new surroundings. Through the applied theoretical framework, this study explored the inequalities faced by interstate migrant workers in India, taking into account various factors before and after the COVID-19 pandemic. The pandemic had a significant impact on their income potential and job satisfaction, with fluctuations observed in different occupations. Facility access also saw significant shifts, highlighting the need for adaptable policies to enhance the working and living conditions of migrant workers in the post-pandemic era. Socio-demographic factors such as gender norms and biases have a significant impact on the experiences of migrant workers. Our findings also emphasized the importance of recognizing women's contributions beyond financial provision in occupational choices. The experiences of migrant workers in Kelakottaiyur are influenced by factors such as caste, education, gender, marital status etc. Challenges faced include poor working conditions, limited education, and gender inequality. To address these challenges, policies should focus on bridging the wage gap, protecting labour rights, and improving working conditions. The pandemic has highlighted disparities in access to facilities for migrant workers. It is important to prioritize inclusive development and reduce disparities to reduce the need for migration.

7. Scope of the Study

The study focuses solely on the migrant workers of construction and manufacturing industries in Kelakottaiyur, Chengalpet District and is limited to the period of January 2020 (pre-COVID-19) and October 2022 (post-COVID-19). Eventually, it focused only on the interstate migrant workers, but the plight of intrastate migrant workers would provide a unique perspective to the working and living conditions that they’re embedded with and it provides scope for the significant differences between the two. By analyzing the shared living and working conditions of migrant workers (both intrastate and interstate), we can take an inclusive approach to improve their livelihoods.

Declaration of Interest

The authors report there are no competing interests to declare.

Data Availability

The authors confirm that the data supporting the findings of this study are available in the article.

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ORIGINAL ARTICLE

The Impacts of Drama *Extraordinary Attorney Woo* on the Autistic Spectrum Disability Awareness Using Big Data Analysis

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ABSTRACT

The aim of this study is to impartially validate the impact of popular drama on shaping awareness of Autistic Spectrum Disability(ASD). This study used a combination of big data and content analysis to assess the patterns and significance of ASD-related news before and after the broadcast of the drama *Extraordinary Attorney Woo*. Big data analysis confirmed that after the broadcast of this drama, articles related to 'autis('japye' in Korean pronunciation) surged dramatically, ranging from a weekly average of at least 4.2 times to a peak of 11.4 times compared to the period before the drama aired. Also, keywords that were highly relevant in articles related to 'autis' in the year before the drama aired included terms indicating pathological conditions, which had the highest weight values in the analysis. After the drama aired, keywords highly associated with 'autis' included a significant number of terms related to the drama *Extraordinary Attorney Woo* or societal interest in ASD. The findings support the notion that the airing of the drama *Extraordinary Attorney Woo* has led to increased public attention to ASD. A comparison of news content before and after the drama aired revealed that perceptions of ASD shifted from an individual to a social model, influenced by the themes presented in the drama. Having confirmed the influence of drama on societal awareness of disability, it is imperative to portray individuals with disabilities in an inclusive manner, emphasizing the importance of enacting disability guidelines and educating producers due to the significant social responsibility and role of drama.

Keywords: Drama, Autistic Spectrum Disability(ASD), big data, content analysis, *Extraordinary Attorney Woo*

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1. Introduction

TV dramas have the advantage of being easy to watch. Conversely, viewers could switch to another channel while watching. Hence, TV dramas mirror sociocultural values and contemporary demands that capture viewers' interests. Viewers are often drawn to TV dramas because of the compelling performances of actors, allowing them to experience reality vicariously. This immersion leads to a deeper connection with social issues as viewers internalize these problems and develop a sense of empathy. TV dramas have the most significant influence on the daily lives of the general public¹⁾. Dramas can mislead viewers by distorting reality. However, they also play a crucial role in guiding viewers to identify real-world issues and catalyze change²⁾.

The dual role of these dramas in the media has wielded a profound influence on shaping society's perception of disabilities. Historically, the portrayal of disabled dramas mirrored society's discriminatory views towards them, perpetuating stereotypes and prejudices. In actuality, 'disability' elicits contrasting sentiments, ranging from 'disgust(-)/attraction(+)' to 'rejection(-)/fascination(+).' This dichotomy gives rise to the concept of gaze violence, manifesting as either an apathetic gaze that disregards the disabled or a voyeuristic gaze rooted in basic curiosity³⁾. Despite the erroneous nature of such attitudes towards people with disabilities, dramas frequently perpetuate familiar stereotypes in society. They often depict disabled characters as either pitiable or inferior individuals in need of assistance, or as intriguing figures possessing extraordinary abilities. Today, this mode of representation faces criticism for perpetuating a form of societal disability that hinders disabled individuals from fully exercising their right to equitable participation in society by presenting them as unique and separate from non-disabled individuals⁴⁾. In light of this very issue, Article 8 of the UN Convention on the Rights of Persons with Disabilities advises that all media entities portray persons with disabilities in a manner aligned with the Convention's objectives and the fundamental human rights of people with disabilities⁵⁾. Concurrently, the emerging portrayal of disability in dramas, which highlights that the core issue lies not in an individual's disability but rather in power imbalances and entrenched societal norms that perceive such disabilities as inferior, has the potential to significantly transform society's perception of disability. An illustrative example of dramas shaping disability awareness is the drama *Extraordinary Attorney Woo*.

The drama *Extraordinary Attorney Woo* exerted a significant influence not only within the Korean society but also internationally. It will achieve the highest viewership rating of 17.5% in 2022, rank first in the topicality index, and secure the top position globally on Netflix. This drama perpetuated the constraints imposed on persons with autistic spectrum disability(ASD) in existing portrayals. In essence, it reinforced the stereotype that associates Attorney Woo, an autistic character, solely with the concept of a genius with savant syndrome. Conversely, it demonstrates a heightened level of awareness regarding ASD. Young-woo Woo, an attorney with ASD and exceptional genius, is depicted as an autonomous individual with self-determination. She is portrayed as an included member of society, undergoing growth and development by achieving developmental milestones, much like individuals without disabilities, during their young adult life. This portrayal has significantly contributed to enhancing society's comprehension of ASD⁶⁾.

Previous studies, including ours, have primarily emphasized the progressive aspects of disability representation in the drama *Extraordinary Attorney Woo*. The disabled protagonist, Young-woo Woo, has received substantial recognition because of her departure from traditional narratives, indicating implications for tasks related to the development of young adults and comprehensive societal inclusion. Additionally, this protagonist played a pivotal role in changing conventional portrayals of disabled people and reshaping public perceptions of disabilities. Nonetheless, these studies criticized drama

for perpetuating specific stereotypes related to persons with autistic spectrum disabilities and for presenting a romanticized version of reality⁶⁻⁸). These studies have yielded significant findings by shedding light on the representation of disability in the popular Korean drama, *Extraordinary Attorney Woo*, which has substantial societal influence. They not only underscored the importance of this representation but also highlighted its limitations. Furthermore, they have contributed to the ongoing discourse on the future direction of depicting disabilities in dramas. Nevertheless, while the drama's societal impact has been acknowledged, citing some articles, its precise influence on the overall disability awareness in society remains challenging to measure objectively. For instance, Lee categorized and presented articles within a relatively brief two-month timeframe following the opening of the drama *Extraordinary Attorney Woo*. While insightful, this approach offered a somewhat partial view of how the discourse surrounding the representation of disability in Young-woo Woo evolved because of the limited duration under examination⁸).

Thus, this study represents an advancement over our previous research that examined the depiction of a person with ASD in the drama *Extraordinary Attorney Woo* from an interdisciplinary perspective that includes cultural and disability studies. Our primary aim was to overcome the limitations of previous investigations by conducting an objective assessment of the drama's societal impact before and after its broadcast. A prior study endeavored to analyze big data using problem recognition, similar to our study. Kwon identified the issue of comparing shifts in media perspectives concerning autism and developmental disorder before and after the opening of the drama *Extraordinary Attorney Woo*⁹). However, this approach only involved a concise summary of the results obtained from keyword searches for 'autism' and 'developmental disorders' in big data. Notably, to accurately gauge the impact of dramas, the duration of the search period was not extensively considered. Rather, it was limited to simple year-to-year comparisons, such as 2021 and 2022. Press articles, which constitute an extensive pool of data, offer valuable resources for conducting big data research. To leverage the potential of big data research fully, it is imperative to surpass the mere act of data retrieval. In particular, the focus should shift towards comprehensive analysis and processing, leading to the extraction of fresh insights that may not have been evident in preexisting dataset¹⁰).

Consequently, this study aimed to validate the impact of popular dramas in shaping ASD Awareness. This study employed a combination of big data and content analysis to assess the patterns and significance of news related to ASD before and after the broadcast of the drama *Extraordinary Attorney Woo*. Through these research procedures, we aimed to objectively confirm the impact of drama broadcasts on increasing the interest in ASD, delivering accurate information, and reducing prejudice and discrimination.

BIGKinds (www.bigkinds.or.kr) was employed as the research instrument for the analysis of big data on shifts in interest. A combined news database from 54 media outlets, including general daily newspapers, business magazines, regional daily newspapers, and broadcasting businesses, was used to create the BIGKinds news analysis service provided by the Korea Press Foundation. BIGKinds offers an analysis of associated big data and has allowed users to search for stories from domestic media outlets since 1990¹¹). We excluded local daily newspapers and focused on national daily newspapers, daily economic newspapers, broadcasting companies, and specialized magazines. We conducted a comprehensive analysis of the impact of media-related articles by examining reports from 26 media companies. We conducted a comprehensive big data analysis of news coverage by dividing the time period to objectively assess the shifts in interest regarding ASD before and after the airing of *Extraordinary Attorney Woo*. To capture significant trends, we compared data from one year before and after the broadcast of *Extraordinary Attorney Woo*. Additionally, for a more granular exploration of specific changes, we

analyzed data from the seven weeks leading up to the broadcast, seven weeks during the broadcast, and seven weeks following the conclusion.

Content analysis, a media research methodology, was used to analyze changes in content related to ASD. Content analysis is a very effective research method for studying media, as it can be used to identify how media represent different groups of people, issues, and events. It can also be used to track changes in the media over time¹²⁾. By conducting a content analysis of media articles, we can gain a deeper understanding of how the drama *Extraordinary Attorney Woo* is perceived by the public and how it impacts their understanding of ASD. Content analysis was performed to identify the predominant types of articles related to ASD among the 74 categories in the article type section categorized by Big Kinds. This analysis covered the year leading up to the airing of *Extraordinary Attorney Woo*, the period during its broadcast, and the year after its broadcast. After verifying the classification types with the highest frequency, they were reorganized into broader thematic categories and subjected to analysis.

2. Interest shifts linked to ASD via analysis of keyword exposure frequency

To ascertain whether the opening of the drama *Extraordinary Attorney Woo* heightened interest in People with ASD and led to an increase in articles related to the subject, an article search was conducted by dividing the timeline into periods before, during, and after the drama's broadcast. The television drama *Extraordinary Attorney Woo* commenced its airing on June 29, 2022, and concluded with its final episode on August 18 of the same year. To conduct a comprehensive analysis of the changes before and after the broadcast, articles published during two distinct periods were examined: from June 29, 2021, to June 28, 2022, one year before the broadcast, and from August 19, 2022, to August 18, 2023, one year after the broadcast. Articles were collected separately for each time frame, and a comparative analysis of their characteristics was conducted. Furthermore, to facilitate a comparative analysis of trends within consistent timeframes, an examination was conducted based on a 7-week interval corresponding to the broadcast duration. This involved evaluating the preceding seven weeks (May 3 to June 28, 2022), the broadcast period itself spanning seven weeks (June 29 to August 18, 2022), and an additional seven weeks after the conclusion of the broadcast (August 19 to October 7, 2022).

2.1. Exploring keyword trends: 'autis' and 'Young-woo Woo' Analysis

Korean articles may employ different terms like 'autism('japyejeung' in Korean pronunciation),' 'autistic disorder('japyeseong jang-ae' in Korean pronunciation),' and 'autistic spectrum disability('japye spetrum jang-ae' in Korean pronunciation).' Therefore, we used the same spelling 'autis('japye' in Korean pronunciation)' as a search keyword. A total of 2,839 articles related to search keyword 'autis' were identified and analyzed throughout the entire study period of approximately 2 years and 2 months, encompassing the timeframe from 1 year before the broadcast to 1 year after the broadcast. Employing keyword trend big data analysis, we conducted a comprehensive examination of the frequency of exposure to related articles across a time series. Notably, during the 7-week period when the drama was broadcasted, there was a notable surge in the quantity of articles pertaining to 'autis' Further analysis revealed that the posting frequency of related articles exhibited a discernible hierarchy, with the sequence being seven weeks after the drama's conclusion, one year after its airing, and one year before its broadcast(Figure 1).

The outcomes of segmenting the search results for the keyword 'autis' were as follows: In the year leading up to the airing of *Extraordinary Attorney Woo* the total number of published articles amounted to 451, averaging approximately 8.5

articles per week. In stark contrast, during the 7-week broadcast period, the total count surged significantly to 773 articles, averaging approximately 96.6 articles per week. Following the conclusion of the broadcast, 436 articles were published over another 7-week span, averaging approximately 54.5 articles per week. Remarkably, this post-broadcast figure exceeds the number of articles released in the year preceding the broadcast. Furthermore, a notable observation is that a cumulative total of 1,614 articles, with an average of 35.5 articles per week, were published within the one-year span following the drama's broadcast. This striking figure signifies an almost four-fold increase in comparison to the article count from the year preceding the drama's opening. Notably, during the specific airing period, a remarkable surge in 'autis'-related article publication was evident, reaching a peak of 196 articles in a single week. This surge strongly validates the discernible increase in articles focusing on ASD subsequent to drama broadcasts.

Among the analyzed articles, those containing the keywords 'autis' and 'Young-Woo Woo' exhibited notably high frequencies. Specifically, during the 7 weeks of the broadcast, 696 articles (constituting 90% of the 773 articles related to 'autis') featured both keywords, while in the 7 weeks following the broadcast, 257 articles (equivalent to 58.9% of the 436 articles related to 'autis') included these keywords. Even one year after the airing, 413 articles (accounting for 25.6% of the total 1,614 articles related to 'autis') continued to intertwine 'Young-woo Woo' with discussions about 'autis.' This consistent association underscores the drama's significant influence on this topic (Figure 1).

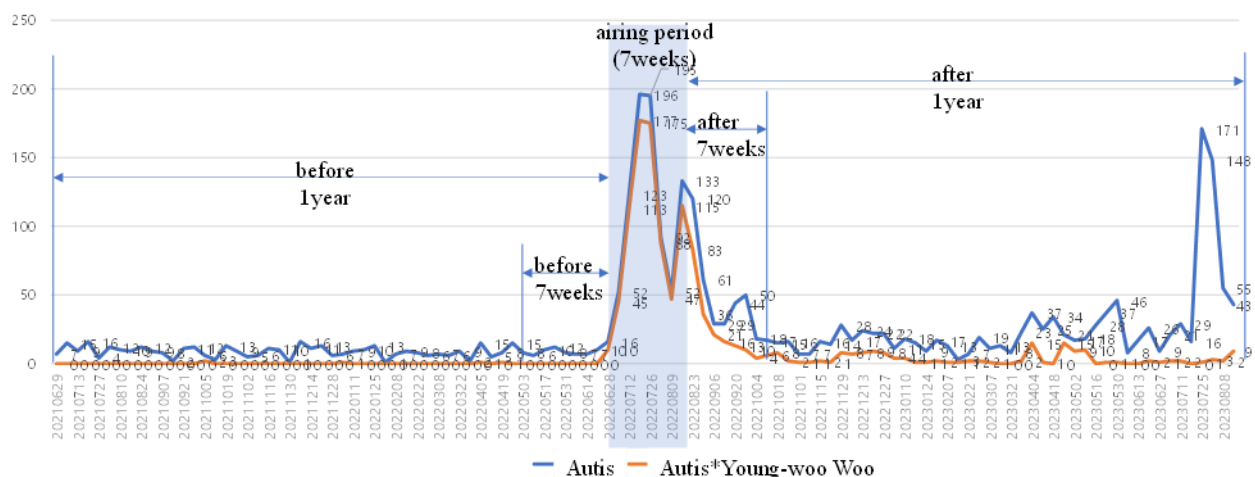


Fig 1. Autis/Autis*Young-woo Woo news article frequency

2.2. Dissecting weekly article counts: 'autis' and 'Young-woo Woo' Analysis

When averaged out, the quantity of articles featuring keywords related to 'Autis' amounted to 8.51 articles per week in the year leading up to the broadcast, and 8.5 articles per week in the 7 weeks preceding the broadcast. Over the course of the seven weeks when *Extraordinary Attorney Woo* was aired, an average of 96.63 articles were published each week, indicating a frequency of article exposure that was 11.4 times higher than before the broadcast. Following the conclusion of the broadcast, the average weekly occurrence over the course of a year reached 35.5, marking a surge of approximately 4.2 times in comparison to the pre-broadcast period. However, this figure decreased by a factor of 0.37 times compared to the duration of the broadcast. Following the 7-week standard of drama broadcasts, we conducted a comparison across the

corresponding periods before, during, and after the drama's airing. The frequency of article exposure, which stood at an average of 8.5 articles per week in the seven weeks preceding the broadcast, increased to 96.6 articles per week, an 11.4-fold increase during the broadcast period. Subsequently, after the broadcast concluded, this frequency diminished to 54.5 articles per week, representing a 6.4-fold increase compared to the pre-broadcast period.

To directly ascertain the impact of drama exposure, we searched for articles containing keywords such as 'autis' and 'Young-woo Woo.' The findings revealed that an average of 87 articles were published per week during the 7-week broadcasting period, and this average dropped to 32.1 articles per week for the subsequent 7 weeks after the broadcast concluded. Hence, correlating with the period of the drama *Extraordinary Attorney Woo* airing, there was a significant surge in the number of articles related to 'autis,' with articles that concurrently mentioned both 'autis' and 'Young-woo Woo' also registering a high frequency of exposure. This substantiates the notion that the airing of *Extraordinary Attorney Woo* spurred heightened media attention towards ASD (Table 1).

Table 1. Autis/Autis*Young-woo Woo weekly article counts

	Jun. 2021	May. 2022	Jun. 2022	Aug. 2022	Oct. 2022	Aug. 2023
Aver./week	8.51	8.5	96.7	54.5	35.5	
Autis	451		773	1,614		
		71		436		
period	before 1Y	before 7W	Airing Per. 7W	After 7W	After 1Y	
Autis*Young-woo Woo		0	696	257		
		5		413		
Aver./week	0.09	0	87	32.1	7.9	

(Unit: cases)

3. Trends in significant keywords associated with 'autis' identified through a keyword word cloud analysis

We performed a related-word analysis to assess shifts in the frequency of article exposure concerning 'autis' and to discern the specific subjects that the articles covered. BIGkind-related word analysis is a feature designed to extract keywords of significant relevance from the searched news content by considering factors such as weight or keyword frequency. This function then offers rankings and scores for each identified keyword, presenting comprehensive big data through visual aids, such as word clouds or bar graphs. BIGkind conducts synchronic analysis and word clustering by analyzing the search results derived from user-provided query terms. Furthermore, it presents the results of related word analysis using the TopicRank algorithm, which facilitates the creation of a dynamically interactive semantic network. The TopicRank analysis was initiated by selecting N documents associated with a specific term. It extracts snippet terms by considering the nouns located before and after the search terms within documents. Subsequently, the extracted snippet terms are narrowed. It calculates both the distance from the search term and frequency of occurrence within the document. These calculations yield a weight configured as a term vector. These term vectors are clustered to identify the top M terms¹¹⁾. In this study, the standard keyword for the related word analysis was 'autis,' which was consistent with the keywords used in the article search.

3.1. Analysis of key related words over the entire study period

Initially, a related word search using a word cloud is executed on the BIGkind platform. The timeframe of analysis spanned roughly two years and two months (from June 29, 2021, one year before the broadcast, to August 18, 2023, one year after the broadcast), and the designated keyword for this purpose was ‘autis.’ Related words were examined using a topic-rank algorithm to assign weighting values. Consequently, words with elevated weight values associated with ‘autis’ included terms like ‘attorney Young-woo Woo,’ ‘Young-woo Woo,’ ‘people,’ ‘IBS,’ and ‘early diagnosis.’

Words closely linked to the drama (such as ‘attorney Young-woo Woo,’ ‘Young-woo Woo,’ and ‘Eun-bin Park’) were recognized as significantly correlated with ‘autis,’ thereby affirming the extensive impact of the drama's influence. Furthermore, in a broader context, keywords present in articles discussing aspects like the diagnosis, treatment, and causes of ASD(including terms like ‘IBS,’ ‘early diagnosis,’ ‘phthalates,’ ‘pathological mechanisms,’ etc.) seemed to exhibit a strong correlation with ‘autis.’ In addition, owing to an article asserting that the perpetrator of a highly disturbing murder that deeply impacted society exhibited traits associated with autistic spectrum disabilities, the actual name of the criminal (‘-’ Yoojeong Jeong) has emerged as a prominent related word(Figure 2, Table 2).

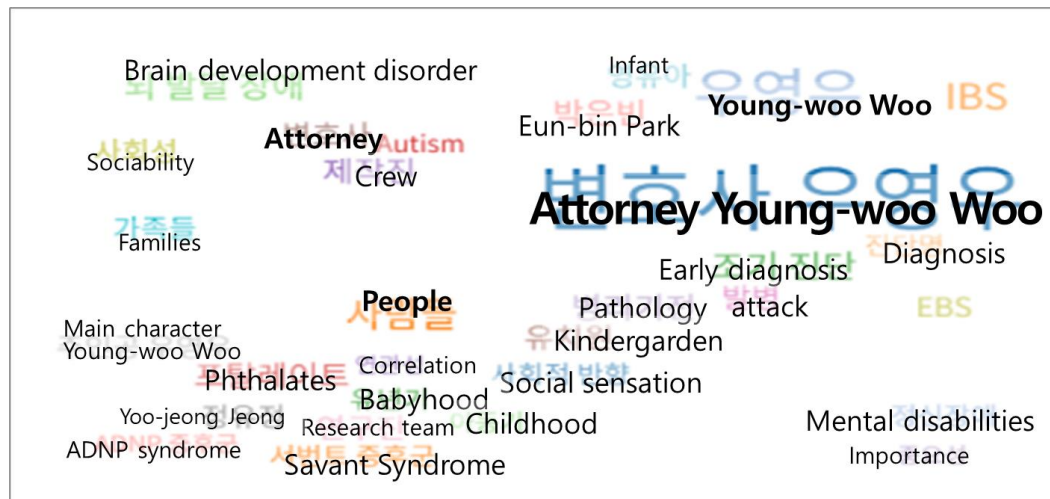


Fig 2. Key related words over the entire period(Jun.2021 ~Aug.2023)

Table 2. Significant related words throughout the entire analysis period

Keywords	Weighted value	frequency
Attorney Young-woo Woo	21.93	61
Young-woo Woo	14.08	244
People	7.62	66
IBS	7.35	34
Early diagnosis	6.39	24
Brain development dis	5.6	14
Phthalates	5.52	65
Eun-bin Park	5.19	16
Crew	5.04	39
Pathology	5.04	7
Attorney	5	116
Kindergarten	4.94	39
Attack	4.8	26
Research team	4.5	31
Yoo-jeong Jeong	4.36	43
Main character Young-woo Woo	4.36	8
Sociability	4.29	71
EBS	4.07	24
Families	4	17
Infant	3.91	39
Social sensation	3.81	5
Mental disabilities	3.68	23
Savant Syndrome	3.53	23
Diagnosis	3.38	17
Babyhood	3.33	68
Childhood	3	16
Autism	3	10
ADNP syndrome	2.73	26
Correlation	2.53	22
Importance	2.18	9

3.2. Analysis of key related words before and after drama airing period

To comprehend the impact of the drama *Extraordinary Attorney Woo*, we conducted an analysis comparing significant words related to ‘autis’ before and after the drama's airing. Keywords highly relevant in articles related to ‘autis’ during the year prior to the drama's airing included terms such as ‘phthalates,’ ‘people with developmental disabilities,’ ‘early diagnosis,’ ‘remedy,’ and ‘attack.’ Terms indicating pathological conditions had the highest weight values in the analysis(Figure 3, Table 3).

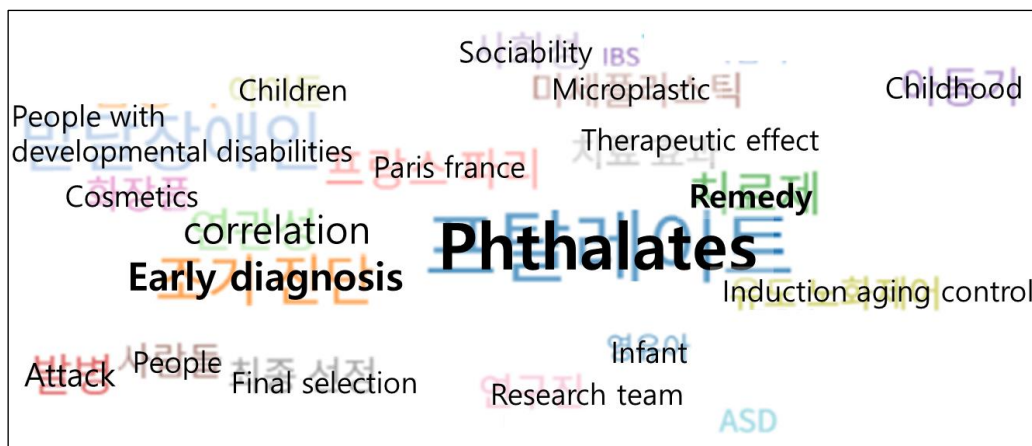


Fig 3. Key related words before drama airing period(Jun.2021 ~ Jun.2022)

Table 3. Significant related words before drama airing period

Keywords	Weighted value	frequency
Phthalates	7.62	104
People with developmental disabilities	6.24	36
Early diagnosis	5.14	16
Remedy	4.32	23
Correlation	4.19	25
Attack	4	16
Parisfrance	4	8
Childhood	3.81	17
Sociability	3.5	48
People	3.33	41
Microplastic	3.33	26
Cosmetics	3.27	15
Research team	3.2	19
Final selection	3.2	5
Therapeutic effect	3.2	5
Induction aging control	3.11	8
Children	3	33
Gold side	2.67	40
ASD	2.4	18
Infant	2.4	15
IBS	1.67	6

When analyzing articles published one year after the show aired, it was evident that keywords highly associated with ‘autis’ encompassed a significant number of terms linked to the drama *Extraordinary Attorney Woo*, including phrases like ‘attorney Young-woo Woo,’ ‘Young-woo Woo,’ ‘attorney,’ ‘Eun-bin Park,’ ‘people.’ Of particular significance is the inclusion of words such as special education teacher, ‘allegations of child abuse,’ ‘developmental disability,’ and ‘Ho-min Joo’ among the top-ranking related terms. This phenomenon can be attributed to the substantial surge in related articles stemming from the controversy surrounding Joo. On July 27, 2023, a renowned webtoon writer and the parent of a child

with developmental disabilities accused his child of child abuse. This event occurred within a relevant period and contributed to the heightened presence of these terms. Furthermore, the list of related words also included instances in which articles discussed a celebrity, such as Don Spike, who described personality issues, such as drug and alcohol consumption, as having autistic tendencies. Additionally, the inclusion of related words was influenced by the educational broadcaster EBS *Ding Dong Dang Kindergarten*, which features a character with ASD(Figure 4, Table 4).



Fig 4. Key related words after drama airing period(Aug.2022~Aug.2023)

Table 4. Significant related words after drama airing period

Keywords	Weighted value	frequency
Attorney Young-woo Woo	124.79	418
Special education teacher	64.54	612
Allegations of child abuse	57.77	151
Attorney	53.53	833
People with Disabilities	52.71	1750
Developmental disability	47.98	769
Eun-bin Park	43.37	481
Ho-min Joo	37.62	747
People	34.08	274
Intellectual disability	30.39	99
ADHD	29.24	131
Webtoon writer Ho-min Joo	27.42	109
Don Spike	22.58	321
Children	19.1	423
Parents	18.81	361
Child studies	17.66	436
ASD	17.06	108
Papageno Foundation	16.45	25
Teacher	16.13	331
Day care Center	16.1	207
AI	13.39	367
Mr. Kim	12.94	183
Kindergarten	12.15	99
EBS	10	53

3.3. Analysis of key related words during 7-week drama airing period and subsequent 7 weeks

Focusing on comparing words related to 'Autis' in articles during two distinct 7-week periods: the first spanning from June 29, 2022, to August 18, 2022, coinciding with the drama's broadcast, and the second covering the subsequent 7 weeks after the drama's conclusion.

Throughout the drama airing period, the most prominent related words included references to the drama, cast, and production company. Notable terms encompassed 'attorney Young-woo Woo,' 'Young-woo Woo,' 'attorney,' 'Eun-bin Park,' 'people,' 'ENA drama attorney Young-woo Woo,' 'Young-woo Woo character,' and 'main character Young-woo Woo.' Furthermore, the analysis revealed the emergence of additional words such as 'Stereotyping,' 'Object of ridicule,' and 'social interest.' Additionally, related words were found in articles discussing criticism of YouTuber's imitating autistic traits, as well as incidents involving persons with autistic spectrum disabilities being denied boarding on airplanes ('Uwaso,' 'netizen,' 'youTuber,' 'denied boarding'). The prevalence of these words signifies a clear escalation in societal awareness and dialogue concerning autistic spectrum disabilities, when compared to the period preceding the drama's airing (Figure 5, Table 5).

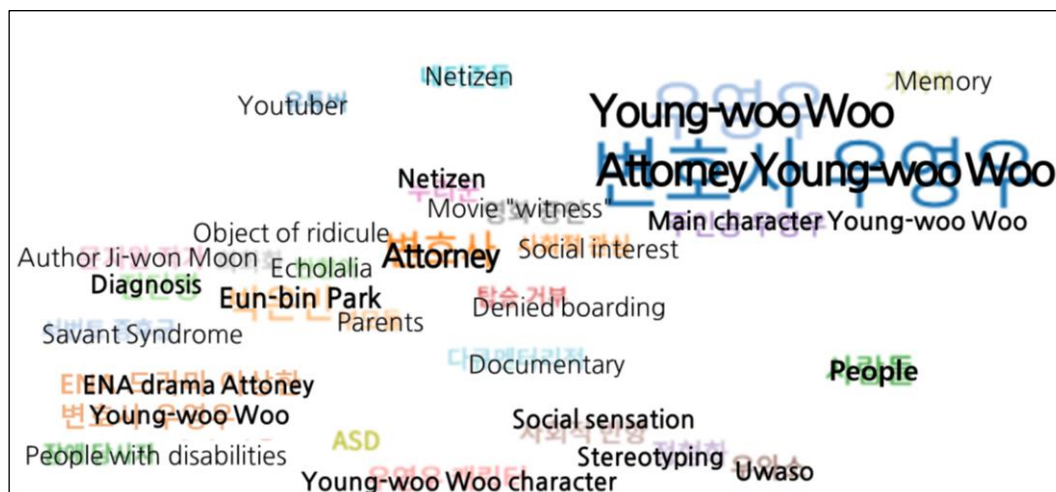


Fig 5. Key related words during drama airing period (Jun.2022~Aug.2022)

Table 5. Significant related words during drama airing period

Keywords	Weighted value	frequency
Attorney Young-woo Woo	50.79	199
Young-woo Woo	40.07	874
Attorney	18.1	389
Eun-bin Park	16.63	102
People	11.31	101
Diagnosis	8.39	18
ENA drama Attoney Young-woo Woo	7.88	0
Young-woo Woo character	7.83	26
Main character Young-woo Woo	7.06	21
Stereotyping	6.72	11
Uwaso	6.61	83
Social sensation	6	9
Netizen	5.42	21
Author Ji-won Moon	5.19	25
Movie "witness"	5.19	0
Object of ridicule	4.71	20
ASD	4.36	15
Memory	4.2	20
Netizens	4.07	18
Documentary	3.81	5
Youtuber	3.68	38
Savant Syndrome	3.53	35
Social interest	3.2	8
Parents	3.11	13
People with disabilities	3.08	8
Echolalia	3	19
Denied boarding	3	6

Even after the passage of 7 weeks since the broadcast, words linked to the drama, including ‘attorney Young-woo Woo,’ ‘Young-woo Woo,’ ‘Eun-bin Park,’ and ‘attorney,’ have retained their prominent relevance. This observation indicates a significant and persistent impact that continues even after the drama concludes, highlighting its lasting influence. Words with a pathological perspective that were present before the drama's commencement ceased to be searched for related words during this period. Conversely, a new related term, ‘young performer,’ emerged due to an article concerning a concert held by a young artist with autistic spectrum disabilities during this timeframe. Furthermore, within the same period, an incident unfolded involving a mother who murdered her child who was diagnosed with autistic spectrum disabilities before taking her own life. This event led to the inclusion of the related keyword ‘Dalseo-gu,’ which represents the location of the incident, as a new associated term. This shift in related words underscores the heightened societal engagement and concern regarding autistic spectrum disabilities (Figure 6, Table 6).



Fig 6. Key related words after a 7-week drama airing period

Table 6. Significant related words after a 7-week drama airing period

Keywords	Weighted value	frequency
Attorney Young-woo Woo	125.31	482
Young-woo Woo	113.66	2212
Eun-bin Park	57.62	616
Attorney	57.08	853
People with Disabilities	35.57	1565
Intellectual disability	18.16	83
People	13.77	219
ENA drama Attorney Young-woo Woo	13.33	0
Developmental disability	10.88	655
Main character Young-woo Woo	10.41	40
Drama Young-woo Woo	7.9	11
Sociability	7.06	57
Ki-young Kang	6.88	128
Social interest	6.69	22
Children	6.55	116
Babyhood	5.05	79
Rating	4.87	166
ASD	4.87	54
Alzheimer's	4.67	17
Young performer	4.67	7
Professional	4.62	71
Brain disease	4	22
Dalseo-gu	4	12

4. Trends changes in issues related to 'autis' through analysis of news article content

News articles about dramas can be broadly categorized into several types: entertainment articles that focus on the plot or actors, social articles that address real-world issues faced by autistic individuals and their families, articles that explore

the connections between celebrities or their families and autistic spectrum disabilities, and articles that provide information or reports on incidents related to autistic spectrum disabilities.

BIGKinds utilized an integrated classification system to categorize 2,912 articles (including 73 duplicate articles) spanning from one year before to one year after the airing of the content. The top 10 ranking categories encompassed 'Broadcasting_Entertainment, Education_Test, People with Disability, Publishing, Science, Events_Accidents, Medical_Health, Movies, Contents, Women, Exhibitions_Performances'(Table 7). We organized the primary article classification areas based on the content of each category. Consequently, the 'Broadcast_Entertainment, Movies' category primarily includes content related to drama broadcasts, while the 'Education_Test' category focuses on articles related to special education. The 'Science, Medical_Health, Women' category encompasses articles related to the pathology and treatment of ASD, as well as topics related to childbirth or parenting in the context of ASD. Additionally, the 'Life, Events_Accidents' category can be classified as articles that predominantly address the social aspects of disability.

Compared to the period before the broadcast, there were notable shifts in article proportions in specific categories during and after the broadcast by *Extraordinary Attorney Woo*. The category 'Broadcasting_Entertainment, Movies' experienced an increase in proportion during and after the broadcast, while the 'Education_Test' category witnessed a significant surge in articles after the broadcast. Conversely, the 'Science, Medical_Health, Women' category saw a slight decrease in proportion(Table 8). These trends indicate significant changes. Among these shifts, the notable increase in the 'Education_Test' category can be attributed to two separate incidents that occurred in Korea after the airing of *Extraordinary Attorney Woo*: the enactment of the King's DNA education law and the controversy involving webtoon writer Joo and his child's special education teacher. These incidents have contributed to a broader range of topics in articles addressing the challenges faced by persons with ASD, reflecting a growing societal perspective. Additionally, although not among the top-ranking categories, there were instances where articles related to ASD were classified under 'Economy > Employment_Startup', which increased from 1 article before the airing to 8 articles after the broadcast. Similarly, articles categorized under 'Society > Labor_Welfare' saw an increase from 1 article before the airing to 7 articles after the broadcast(Table 7). This shift can be interpreted as heightened interest in the employment and social participation of persons with ASD and disabilities, underscoring the evolving discourse on these topics.

Table 7. Classification of ‘autis’ keyword article content according to BigKinds integrated classification system

Ranking	Classification area	Total period		Before airing		On air		After airing	
		Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)
1	Culture>Broadcasting_Entertainment	604	20.7	41	8.9	310	39.5	253	15.2
2	Society>Education_Test	420	14.4	29	6.3	31	3.9	360	21.6
3	Society>People with Disability	319	11.0	81	17.5	63	8.0	175	10.5
4	Culture>Publishing	233	8.0	41	8.9	98	12.5	94	5.6
5	IT_Science>Science	163	5.6	41	8.9	25	3.2	84	5.0
6	Society > Events_Accidents	156	5.4	26	5.6	5	0.6	125	7.5
7	Society>Medical_Health	112	3.8	25	5.4	18	2.3	69	4.1
8	Culture>Movies	83	2.9	1	0.2	30	3.8	52	3.1
9	Science>Contents	71	2.4	9	1.9	33	4.2	29	1.7
10	Society>Women	70	2.4	21	4.5	10	1.3	39	2.3
11	Culture>Exhibition_Performances	60	2.1	11	2.4	7	0.9	42	2.5
12	Culture>Life	52	1.8	4	0.9	31	3.9	17	1.0
13	Culture>Music	49	1.7	1	0.2	8	1.0	40	2.4
14	Society>Media	40	1.4	1	0.2	13	1.7	26	1.6
15	International>Europe_EU	32	1.1	6	1.3	8	1.0	18	1.1
16	Society > General Society	31	1.1	10	2.2	1	0.1	20	1.2
17	Culture>General Culture	27	0.9	7	1.5	5	0.6	15	0.9
18	Culture>Art_Architecture	22	0.8	8	1.7	3	0.4	11	0.7
19	International>Asia	21	0.7	2	0.4	10	1.3	9	0.5
20	IT_Science>Internet_SNS	20	0.7	14	3.0	1	0.1	5	0.3
21	Sports>Golf syncopation	20	0.7	6	1.3	3	0.4	11	0.7
27	Economy>Employment_Startup	10	0.3	1	0.2	1	0.1	8	0.5
	syncopation								
29	Society>Labor_Welfare	9	0.3	1	0.2	1	0.1	8	0.4
	omitted below								
	Total	2,912	100	462	100	785	100	1,665	100

Table 8. ReClassification of ‘Autis’ keyword article content by researchers

Major reclassification areas	Total period		Before airing		On air		After airing	
	Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)	Number of articles (case)	article rate (%)
Broadcasting_Entertainment+Movies	687	23.6	42	9.1	340	43.3	305	18.3
Education_Test	420	14.4	29	6.3	31	3.9	360	21.6
Science+Medical_Health+Women	345	11.8	87	18.8	53	6.8	192	11.5
Events_Accidents+Life	208	7.1	30	6.5	36	4.6	142	8.5

The drama *Extraordinary Attorney Woo* raised public sympathy and awareness by covering a wide range of topics through its articles, including vocation and independence as portrayed by Young-woo Woo, love and relationships for persons with developmental disabilities, social prejudice, and violations of judicial rights.

While other articles about celebrities or accidents may not appear to be directly related to the drama *Extraordinary attorney Woo*, there has been an increase in the frequency of articles about autistic spectrum disabilities since the drama began airing. Many of these articles cited ‘Woo Young-woo’ in their titles and content, suggesting that the drama has had an influence on the coverage of autistic spectrum disabilities-related topics.

Prior to the opening of the drama *Extraordinary Attorney Woo*, articles about autistic spectrum disabilities primarily focused on identifying its pathological characteristics or causes, the effects of chemical exposure during pregnancy, treatment developments, and topics related to children and infants. Consequently, there is limited interest in adults with ASD, and a lack of perspective from a social model. However, after *Extraordinary Attorney Woo* began airing, there was an increase in the number of articles discussing various social perceptions, discrimination, and exclusion related to autistic spectrum disabilities. This suggests that drama positively influences coverage of these topics.

The individual model perceives disability-related challenges as incidents befalling person with disability. This calls for expert intervention to resolve these issues and centers on changes within the disabled individuals themselves. However, when viewed through the lens of disability studies, this perspective of attributing disability problems solely to an individual's circumstances falls short of providing a comprehensive solution. This inadvertently imposes the burden of solely overcoming disabilities through individual exertion. In contrast, from the standpoint of disability studies, the social model has emerged as an approach that locates the root of disability-related challenges within an environment that does not align with an individual's characteristics. This model emphasizes enhancing the social milieu and providing adequate support to promote social inclusion. In adopting this critical perspective, the focus shifts from blaming the individual to fostering an inclusive societal framework that addresses broader factors contributing to disability-related concerns¹³⁻¹⁴. The findings of the content analysis affirm that the broadcast of this drama exerted a favorable influence on the transformation of perspectives within Korean society, specifically, a shift from an individual model of understanding disability towards adopting a more encompassing social model.

5. Conclusions

To ascertain whether the opening of the drama *Extraordinary Attorney Woo* heightened interest in People with ASD and led to an increase in articles related to the subject, an article search was conducted by dividing the timeline into periods before, during, and after the drama's broadcast. The big data analysis results suggest that the drama *Extraordinary Attorney Woo* has increased social interest in ASD. It has been verified that following the broadcast of this drama, articles related to ‘autis’ surged dramatically, ranging from a weekly average of at least 4.2 times to a peak of 11.4 times compared to the period before the drama aired. there was a significant surge in the number of articles related to ‘autis’ with articles that concurrently mentioned both ‘autis’ and ‘Young-woo Woo’ also registering a high frequency of exposure. This substantiates the notion that the airing of *Extraordinary Attorney Woo* spurred heightened media attention towards ASD. Also, keywords highly relevant in articles related to ‘Autis’ during the year prior to the drama's airing included terms indicating pathological conditions carried the highest weight values in the analysis. After this drama aired, keywords highly associated with ‘Autis’ encompassed a significant number of terms linked to the drama *Extraordinary Attorney Woo* or societal interest in ASD.

By comparing news content before and after the drama aired, it became evident that the perception of ASD shifted from an individual model to a social model, influenced by the themes presented in the drama. Before the drama aired, articles about autistic spectrum disabilities tended to focus on negative perceptions and emphasized prevention and treatment based on the assumption that autistic spectrum disabilities was a pathological condition. However, after the drama began to air, the focus of articles shifted to social issues, which became the predominant subject matter.

The challenges faced by persons with autistic spectrum disabilities are not just personal problems but also societal issues that require collective action to improve the social environment and address prejudice and discrimination. Given the confirmed impact of dramas in raising social awareness of disabilities, it is important to actively promote the inclusion of people with disabilities as equal members of society with the same rights and opportunities as others. This includes efforts to address prejudice and discrimination. Additionally, it is necessary to establish guidelines and educate media producers to ensure that their portrayals of people with disabilities do not perpetuate negative stereotypes or distort public awareness.

The significance of this study lies in its advancement beyond a critical analysis of media portrayals of people with disabilities to provide objective evidence on the impact and societal repercussions of dramas on disability awareness through comprehensive big data and content analyses. However, owing to the focus on media articles assessing the influence of popular dramas featuring disabled characters on ASD awareness, this study may not capture broader shifts in public perception. Subsequent research using big data from social media platforms, which can effectively gauge public sentiments in contemporary society, is recommended as a follow-up study. Additionally, as part of our future research, we intend to critically assess dramas depicting people with disabilities from an inclusive perspective, delving into the guidelines for such representations and issues related to the participation of people with disabilities in drama production.

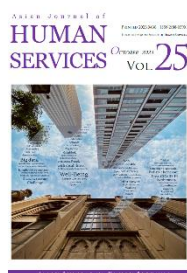
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ORIGINAL ARTICLE

Happiness among Young Adults Living in Poverty in South Korea

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ABSTRACT

Given the increasingly unstable labor market, South Korean young adults are facing a variety of difficulties. This study investigates health, financial, psychological, and social factors affecting happiness among South Korean young adults in poverty. Using a sample of 722 young adults in poverty receiving welfare benefits, multiple regression analysis results indicate that financial stress, employment hope, perceived health condition, social capital, family support, and resilience are significantly associated with happiness level. Particularly, the psychological and social factors are strongly associated with happiness. These findings highlight the necessity and importance of intervention to empower psychological strengths and social relationships to improve happiness among vulnerable young adults in poverty.

Keywords: Happiness, young adults in poverty, young adults in South Korea, multiple regression analysis

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1. Introduction

Happiness has long been an important theme in various academic fields¹⁻³). The studies regarding happiness have investigated the determinants of happiness primarily among children or adolescents⁴⁻⁹), the elderly¹⁰), or adults in general with no specific age group¹¹⁻¹⁴).

However, relatively little attention has been paid to happiness among young adults and the limited research that has been done has focused on college students¹⁵⁻²¹), overlooking young adults who have not received higher education. Research on the happiness of young adults began in the mid-2010s, and has examined financial, employment-related, family-related, and psychological factors as determinants of happiness²²⁻²⁵). All these studies targeted young adults in general.

In developed countries, risk of poverty among young people has increased due to deepening labor market instability and the prolongation of COVID-19. In particular, there was a high correlation between individual labor market experiences and its potential deleterious consequences^{26,27}). Poverty among Korean youth is not limited to economic aspect, but they are experiencing multidimensional and overlapping deficiencies such as education, jobs, and housing²⁸). Young adults have emerged as one of the most vulnerable groups over the past decade in South Korea because of the increasingly unstable and flexible labor market. They are more likely to work in temporary, part-time, or platform-based work, compared to the previous generation that has already entered the labor market²⁹). The difficulty in achieving a secure job is accompanied by financial, psychological, and social difficulties^{29,30}). Particularly, young adults from disadvantaged families tend to be more vulnerable due to the lack of resources to rely on. In fact, previous studies have reported that young adults from low-income families experience more physical, psychological, and behavioral problems³¹⁻³³), and are a higher risk of involvement in crimes^{34,35}). Meanwhile, national comparative studies have reported that the happiness level of South Koreans is the lowest for all age groups compared to their counterparts in other countries. South Korean children and teenagers aged 9 to 17 are the least happy³⁶) and adults also showed the lowest happiness level³⁷) among their peers in all other OECD countries. Although demographic trends suggest that the number of young adults in poverty is rapidly increasing under COVID-19²⁸), their happiness has rarely been studied. Research has mainly been conducted to verify factors that affect the happiness of college students and young adults in Korea³⁸⁻⁴¹). The few empirical studies about happiness among young adults in poverty have examined a specific theory about happiness or only local living subjects^{42,43}).

Taken together, the previous studies on happiness have overlooked young adults, especially vulnerable young adults such as in poverty and without higher education^{15,18,21}). In this respect, the current study empirically investigates the factors affecting happiness of young adults in poverty in order to provide policy and practical implications for enhancing the happiness of impoverished young adults experiencing multiple difficulties. This study aims to foster a better understanding of the factors associated with happiness among impoverished young Korean adults, thereby stimulating active discussions for the development of effective policies and practical interventions to enhance happiness among young adults living in poverty.

2. Theoretical background

2.1. Defining happiness

Of the extent studies on happiness have tried to unveil the nature of happiness⁴⁴⁻⁵⁵). The concept of happiness seems as varied as the number of scholars. For example, the bottom-up theory of happiness considers that happiness is the sum of pleasant and unpleasant experiences⁵⁶). In other words, the more often individuals are exposed to a pleasant external environment, the happier they are⁵⁷). Similarly, the objective list theory explains that actual valuable conditions such as professional achievements and material comforts determines happiness⁵⁸). On the other hand, happiness can be spurious depending on one's personality and traits, rather than affected by external environments⁴⁶), according to the top-down theory. The integrated theory suggests that both external environments and individual personalities affect happiness⁵²). This theory has strength as it can collectively explain that happiness can be affected by both external environments and individual personalities. Particularly for young adults in poverty, their happiness can be affected by both personal characteristics, such as gender, age, educational status, and wider socio-economic environments, including the place of residence, welfare system and labor market within the country of residence. Therefore, the current study adopts the integrated theory and examines the effects of various factors, encompassing both internal and external elements, on happiness among South Korean young adults in poverty.

2.2. Determinants of happiness

Empirical studies on happiness have investigated the level of happiness or the determinants of happiness^{36,37,59-61}). Studies exploring the determinants of happiness have proposed multiple factors affecting happiness in the general adult population.

First of all, financial factors are one of the most frequently discussed in regard to contributing factors to happiness. While some studies have reported a positive association⁶²⁻⁶⁴), others have found the positive association between income and happiness was only relevant for income up to a certain amount^{57,65-70}). The previous literature has also demonstrated that financial factors such as savings, debt, and financial stress also have a significant influence on happiness; specifically, some studies identified a positive effect with savings^{71,72}), whereas others found a negative effect with debt⁷³) and financial stress⁷⁴).

Psychological factors such as self-esteem¹⁴), grit^{75,76}), resilience⁷⁷), and hope⁷⁸) have been reported as important determinants of happiness. Psychological factors contribute to happiness by alleviating stress caused by objective environment⁷⁹) and promoting positive self-evaluation and constructive thinking about future. Studies have identified social factors such as social capital⁸⁰⁻⁸²), trust in one's society⁸³), and relationships with family members⁸⁴⁻⁸⁶) and friendship¹⁶) as significant determinants of happiness.

While existing studies have explored various factors affecting happiness, little attention has been paid to impoverished young adults among happiness literature. Young adults living in poverty in South Korea often find themselves with inadequate family resources, compelling them to take up unstable jobs, and subsequently, enduring chronic poverty throughout their lives. Notably, approximately 90% of young adults residing in Seoul, the capital of South Korea, reported experiencing multi-dimensional poverty in at least one area, with about 42% indicating such poverty in three or more areas. This underscores the necessity for comprehensive interventions encompassing labor, housing, health, and social supports²⁸). Moreover, the suicide rate among young adults aged 20-35 years old has been steadily increasing since 2017, with about 42%

admitting to having suicidal thoughts⁸⁷⁾. As the lives of young adults become increasingly challenging, examining the factors contributing to happiness among this group becomes crucial. Therefore, the current study focuses on young adults in poverty in the South Korean context, and examines the financial, psychological, and social factors have effects are associated with happiness.

3. Methods

3.1. Sample and data collection

The study sample consists of 722 young adults in poverty participating in the Youth Hope Growing Account (YHGA) program, an individual development account (IDA) for young adults provided by the Korean Ministry of Health and Welfare. YHGA was launched in 2018 targeting young adults who aged 15 to 39 receiving subsidies from the National Basic Livelihood Security (NBLS), a public assistance program targeting individuals with income levels below the 30% of median income. The age range of young adults varies depending on the study, but according to the psychosocial development theory of Erikson, a mainstream developmental psychologist, it refers to the age range of 18-40⁸⁸⁻⁸⁹⁾. This study used the secondary data collected from the “the First Panel Study on the Participants of the Youth Hope Growing Account (YHGA) Program in South Korea”⁹⁰⁾. Although the sample of this study is comprised of young adults who have participated in YHGA, Choi and colleagues⁹¹⁾ reported no significant difference between participants and non-participants of YHGA in terms of gender, age, educational level, and employment status among young adults receiving NBLS through a t-test for analyzing the differences between two groups. Given no significant difference in their poverty status, it can be estimated that the sample of this study represents a population of young adults in poverty, with income below 30% of the median income. The original sample of “the First Panel Study on the Participants of the Youth Hope Growing Account (YHGA) Program in South Korea”⁹⁰⁾ were used for the analysis. A total of 722 subjects were used for the analysis.

The characteristics of sample are reported in Table 1. More than half (62.7%) were female, and about two-thirds of respondents (66.1%) had no specific religion. Most respondents were high school graduates (49%) or college graduates (45.7%). About two-thirds of respondents (63.7%) were working part-time. They were, on average, 24.76 years old and lived with 2.86 family members.

Table 1. Sample characteristics (n = 722)

	N/Mean(min-max)	%(SD)		N/Mean(min-max)	%(SD)
Gender			Religion		
Male	269	37.3	No religion	477	66.1
Female	453	62.7	Have religion	245	33.9
Education level			Type of working hours		
Lower than middle school graduates	35	4.8	Part-time worker	460	63.7
High school graduates	357	49.4	Full-time worker	262	36.3
College graduates and above	330	45.7	Age	24.76(17-39)	4.24
Number of families living together	2.86(1-10)	1.53	Health condition	5.57(0-10)	2.50

3.2. Measures

3.2.1. Happiness

This study measured the dependent variable using the happiness scale⁹²⁾ validated in Korean. The scale consists of two factors and nine items: (1) cognitive elements (3 items) and (2) emotional elements—positive (3 items) and negative emotions (3 items). It employs a 7-point Likert scale ranging from 1 = not at all to 7 = all the time. The happiness level was calculated by subtracting the sum of negative emotions from the combined score of cognitive elements and positive emotions. The scale's reliability was .88 in the original online survey and .86 in the original interview survey. In this study, it was .86.

3.2.2. Financial factors

The study employed both objective and subjective indicators of financial factors. Objective indicators used in this study include working hours (full time=1, part time=0), income, personal savings, and debt. The study used the InCharge financial distress/financial well-being (IFDFW) scale⁹³⁾ to measure financial stress as a subjective indicator. All of the monetary variables (income, savings, and debt) were log transformed in the analyses. IFDFW consists of seven items measured on a 5-point scale, where higher scores indicate higher levels of financial stress. The Cronbach's alpha was .96 in the original study and .87 in this study, indicating excellent internal consistency.

3.2.3. Psychological factors

The study considered psychological factors such as self-esteem, grit, resilience, and employment hope as determinants of happiness. The present research adopted the Rosenberg Self-Esteem Scale (RSE)⁹⁴⁾, the Short Grit Scale (Grit-S)⁹⁵⁾, the Connor-Davidson Resilience Scale⁹⁶⁾, and the Korean Employment Hope Scale (K-EHS)⁹⁷⁾ to measure psychological strengths. The RSE scale consists of five items for positive self-esteem and five for negative self-esteem. Each item was rated on a five-point Likert scale (1 = not at all to 5 = all the time). The Cronbach's alpha of the original study was .92 and .87 in this study. Grit refers to a sense of relentlessness or courage that plays a decisive role in creating success and achievement. The study used the Short Grit Scale (Grit-S)⁹⁵⁾ to measure grit, which consists of 8 items on a 5-point scale. The Cronbach's alpha of the original study was .79 and .83 in this study for the Grit-S scale. To measure the level of resilience of South Korean young adults in poverty, the current study utilized the Connor-Davidson Resilience Scale⁹⁶⁾, consisting of two items: "I adapt to change well" and "I'm in good shape even after experiencing difficult things." The scale measured on 5-point Likert scale, with a higher score indicating higher resilience. The Cronbach's alpha was .89 in the original study and .71 in this study for the resilience scale. The Korean Employment Hope Scale (K-EHS)⁹⁷⁾ was adopted to assess the level of hope related to employment prospects. The scale consists of 4 factors and 17 items. Respondents rated each statement on a five-point Likert scale ranging from 1 = not at all to 5 = all the time. The original Cronbach's alpha was .94 and .95 in this study.

3.2.4. Social factors

The study included family relationships and social capital as the social factors affecting happiness. The present research measured family relationship using the dimension of family support from the Multidimensional Scale of Perceived Social Support (MSPSS)⁹⁸⁾ comprising three dimensions and 12 items: support from family (4 items), friends

(4 items), and significant others (4 items). Respondents rated each statement on a 5-point Likert scale ranging from 1=not at all to 5=all the time. The Cronbach's alpha was .91 in the original study and .92 in this study. The study also utilized social capital scale developed by Lee and Ko⁹⁹). The scale is a four-factor, 20-item construct comprising trust (4 items), network (5 items), social participation (6 items), and norm consciousness (5 items). Each item was rated on a 5-point Likert scale (1=not at all to 5=all the time). The Cronbach's alpha was .87 in the original study and .84 in the current study.

3.2.5. Control variables

The study considered demographic characteristics such as gender, educational level, religion, age, number of family members living together, and health condition as control variables. Gender, educational level, and religion were treated as binary variables. Respondents who are male, college graduates or higher education, and those with a specific religion were coded as "1," while those who are female, with a high school education or lower, and those with no religion were coded as "0." The study used one question with an 11-point Likert scale ranging 0 = very bad to 10 = very good to measure a health condition perceived by respondents.

3.3. Analyses

First, the study used descriptive statistics and Pearson correlations to analyze the primary variables and their relationships. In addition, the study tested the normality of the data using the values of skewness and kurtosis. Given the data's normal distribution, a multiple regression analysis was used to investigate the association between multiple predictors and happiness, while controlling for demographic characteristics such as gender, age, education, age, and number of families living together.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + u$$

Y is the happiness level, X_1 is the demographic factors (e.g. gender, religion), X_2 is the economic factors (e.g. working hours, income), X_3 is the psychological factors (e.g. self-esteem, grit), X_4 is the social factors (e.g. family support, social capital), u is the error term; and α is the intercept. After conducting listwise deletion for handling the missing data, a sample of 685 young adults in poverty was used for the final analysis.

4. Results

Table 2 displays the descriptive statistics of the primary study variables. The average level of happiness was 12.90 (SD = 8.46). As a result of testing the normality of the data using skewness and kurtosis, the study found evidence of normality with the absolute values of 8 or less¹⁰⁰) for all study variables.

Table 2. Descriptive statistics

	Mean	SD	Range	Skewness	Kurtosis	N
Happiness	12.90	8.46	-15-38	-0.16	0.58	722
Total income	4.58	1.43	0-6.8	-2.23	4.88	722
Personal savings	1.91	1.67	0-5.3	0.12	-1.40	721
Debt	3.00	3.35	0-9.5	0.34	-1.69	686
Financial stress	3.54	0.83	1-5	-0.39	-0.04	722
Self-esteem	3.22	0.33	1-5	-0.35	7.25	722
Grit	3.21	0.63	1-5	0.10	0.34	722
Resilience	4.96	1.72	0-8	-0.10	-0.12	722
Employment hope	3.63	0.68	1-5	-0.20	0.85	722
Family support	3.27	1.02	1-5	-0.41	-0.14	722
Social capital	2.84	0.49	1-5	0.31	1.79	722

The study conducted a correlation analysis to examine the strength of relationship between happiness and independent variables (Table 3). Except for the correlation between the happiness and total income, happiness and personal savings, the other study variables were correlated with happiness, as expected.

Table 3. Correlation matrix of the study variables (n=722)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	1										
(2)	-.037	1									
(3)	.055	.314**	1								
(4)	-.106**	.139**	-.035	1							
(5)	-.437**	.073*	-.138**	.331**	1						
(6)	.141**	.010	.055	.078*	.134**	1					
(7)	.434**	.017	.010	-.049	-.254**		1				
(8)	.448**	.006	-.004	.043	-.115**	.227**	.466**	1			
(9)	.580**	-.042	.016	.040	-.133**	.245**	.494**	.563**	1		
(10)	.397**	.010	.034	-.043	-.149**	.047	.205**	.234**	.394**	1	
(11)	.498**	.025	.098**	-.068	-.174**	.174**	.337**	.351**	.498**	.399**	1

Notes: (1) Happiness, (2) Total income, (3) Personal savings (n=721), (4) Debt (n=686), (5) Financial stress, (6) Self-esteem, (7) Grit, (8) Resilience, (9) Employment hope, (10) Family support, (11) Social capital.

The results of the multiple regression analysis indicate that financial, psychological, and social factors explain about 57.5% variance for happiness ($F = 55.522$, $p < .001$). Financial stress, resilience, employment hope, family support, social capital, and perceived health condition appear to be significantly associated with happiness. Financial stress turns out to have a significant negative association with happiness ($\beta = -0.281$, $p < .001$) among financial factors, which indicates that the higher financial stress individuals perceive, the less happy. Employment hope ($\beta = 0.250$, $p < .001$) and

resilience ($\beta = 0.097$, $p < .01$) appear to be positively associated with happiness, demonstrating that the more hope for employment and resilience individuals have, the happier they are. Social factors such as family support ($\beta = 0.110$, $p < .001$) and social capital ($\beta = 0.162$, $p < .001$) also turn out to be positively associated with happiness. Out of control variables, perceived health condition is positively associated with happiness ($\beta = 0.238$, $p < .001$), indicating that the healthier individuals perceive themselves, the happier they are.

Table 4. The results of multiple regression analysis among low-income young adults (n = 685)

	B	S.E.	β
Financial factors			
Type of working hours (full-time worker=1)	-0.016	0.465	-0.001
Total income	0.027	0.161	0.004
Personal savings	-0.082	0.139	-0.016
Debt	0.044	0.073	0.017
Financial stress	-2.863	0.296	-0.281***
Psychological factors			
Self-esteem	0.896	0.695	0.035
Grit	0.755	0.427	0.056
Resilience	0.479	0.158	0.097**
Employment hope	3.114	0.455	0.250***
Social factors			
Family support	0.914	0.242	0.110***
Social capital	2.798	0.543	0.159***
Control variables			
Gender (men=1)	0.162	0.457	0.009
Religion (have religion=1)	0.189	0.459	0.011
Educational level (college and above =1)	-0.319	0.450	-0.019
Age	-0.099	0.054	-0.049
Number of families living together	0.159	0.143	0.029
Health condition	0.802	0.091	0.238***
Constant	-9.439	3.034	
F		55.522***	
R^2		0.586	
Adjusted R^2		0.575***	

* $p < .05$, ** $p < .01$, *** $p < .001$

5. Discussion

Despite the plethora of happiness studies conducted with children and adolescents^{6-8,101}, young adults have been overlooked in happiness research. Young adults have recently emerged as a vulnerable generation along with the difficulties of achieving decent and stable jobs. In particular, young adults living in poverty tend to face multiple risks mainly due to the lack of family economic resources. In addition, because South Koreans have been reported to have the lowest happiness levels for all age groups compared to other countries^{36,37,60}, this study focuses on South Korean young adults in poverty and examines the various predictors of happiness.

The multiple regression analysis of young adults in poverty revealed the significant impact of financial stress, employment hope, health condition, social capital, family support, and resilience on happiness. First, this study found that financial stress is the most powerful predictor of happiness, implying that the happiness level of disadvantaged young adults largely depends on their level of financial stress. This finding also concurs with previous studies⁷⁴ and suggests the necessity of policies—such as financial consultations, education, and allowances—to alleviate financial stress and enhance happiness. This study also found the positive impacts of psychological factors such as employment hope and resilience on happiness among South Korean young adults in poverty, which is consistent with prior studies^{77,78}. These results indicate that happiness among young adults depends on their level of employment hope, which consists of psychological empowerment and motivation, setting realistic financial goals and moving towards them⁹⁷, resilience, and the power to recover from failure¹⁰². These results suggest the importance and necessity of programs and services to enhance young adults' psychological strengths. As found in the existing literature^{80,81,83}, social factors such as family support and social capital appear to be significantly associated with happiness in the current study. These results imply the necessity of community-based support to build and reinforce social relations, such as providing a space for young adults to gather in local communities. Additionally, for disadvantaged young adults who mostly lack family support, it seems vital to provide resources and information regarding employment, housing, finance, and relationships to supplement their insufficient family support. Out of the demographic factors, health condition appears to be positively associated with happiness, consistent with the previous studies^{4,14,103}. These results suggest the necessity for health interventions such as regular checkups, exercise, and mental health care for young adults who are regarded as relatively healthy and not considered as primary targets of health-related programs.

Unexpectedly, the study's objective economic indicators—including income, savings, and debt—appear to have an insignificant association with happiness. These findings may result from the characteristics of the sample with little variation in economic factors because the study sample only consists of young adults in poverty receiving public assistance with an income below 30% of the median income. Whereas the objective indicators were not statistically associated with happiness, financial stress, a subjective indicator, appeared to be a significant predictor of happiness among young adults in this study. These results are consistent with the arguments of Diener and colleagues^{104,105} proposing that individual perception is more crucial than objective situations in predicting happiness.

The primary limitation of the current study arises from its targeted survey respondents. The survey focused on young adults living below the poverty line receiving public assistance in South Korea. Thus, the research findings cannot be generalized to young adults of all income levels. Another limitation is associated with the study's use of cross-sectional survey data. Since developing happiness takes a long time, using a single survey data may restricts our understanding of the causalities of happiness. Also, resilience, employment hope, family support, and social capital may be significant to

happiness among overall young adult not only young adults in poverty. It is necessary to conduct comparative analysis of determinants of happiness between poor and non-poor young adults in future research. Lastly, the study does not deeply probe specific experiences related to happiness among young adults in poverty. Therefore, future research may need to examine the determinants of happiness through a longitudinal study and examine the diverse mechanisms in regard to happiness. Additionally, qualitative may be needed to understand how happiness of young adults is affected by multiple factors.

Despite these the study limitations, the present study is meaningful in that it proposes, through an empirical analysis, practical implications to improve the happiness of young adults in poverty. As South Korea has prioritized the policy of pursuing economic growth over the past several decades, individuals' happiness and quality of life have been frequently overlooked. However, given the country's economic prosperity and low level of happiness, now is the time to discuss happiness and implement potential strategies to enhance happiness.

The research findings also highlight the needs for practical implications to enhance young adults' happiness, including implementing policies and programs that can support their healthcare and economic self-sufficiency and alleviate current financial stress through financial consultations, financial education, and youth allowances. Additionally, the study also suggests practical implications to improve young adults' psychological strengths and to provide resources and information regarding employment, housing, finance, labor, relationships, and education. These findings are expected to promote further discussion on the happiness and quality of life of young adults and especially discouraged young adults.

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ORIGINAL ARTICLE

Unravelling the Employee Retention Enigma in Semiconductor Industry: A Focus on Penang, Malaysia

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ABSTRACT

This study aims to investigate the relationship between five factors (employer branding strategy, salary and benefits, training and career development, job flexibility, and supervisor support) and employee retention in the semiconductor industry in Penang, Malaysia. Data was gathered using questionnaires distributed via email and social media and was analysed. Based on the responses from 152 employees, the results showed that employer branding strategy and supervisor support contributed significantly to employee retention. The findings highlight the importance of semiconductor companies maintaining a strong employer branding strategy and supervisors providing full support to employees as strategies for employee retention.

Keywords: Employee retention, branding strategy, supervisor support, semiconductor industry, technological advancement

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1. Introduction

In the competitive economic market of today, the key success of an organisation is measured not only by meeting and fulfilling the expectations of customers but also by the satisfaction of employees^{12,48}. Employees are widely acknowledged as the backbone of any business and the most important asset for any organisation to function efficiently⁷². Organisations expect employees to apply not only their technical skills but also their individual capabilities and abilities to provide excellent performance that propels the organisation toward accomplishing its mission and vision⁷¹. Employees, on the other hand, are expecting more from their employers, such as higher pay, increased accountability, a good working environment, and the list goes on. Nonetheless, the most significant challenge that organisations face is employee turnover, which occurs when an employee leaves the company and the vacancy must be filled by someone else¹. Employee retention is thus critical for organisations to achieve their goals^{79,92,95}.

Further, approximately 60% of organisations admitted to having difficulty retaining employees especially those top talent²⁸, with 70% of them unable to find replacements within the notice period¹. Employee turnover has a number of negative consequences, amongst them, increased cost, resources and work delays, lower morale, decreased performance, and poor productivity^{17,45,46}.

This study seeks to examine the factors influencing employee retention in the semiconductor industry in Penang. Penang became the first Free Industrial Zone in Malaysia in the 1970s. Many electronic and electrical multinational corporations (MNCs) such as Intel, ASE Electronics, Sony, and Motorola are well established in Penang due to its strategic location, modern infrastructure, good supply chain, and supply of talent. Over the years, these semiconductor companies have evolved from low-skilled manufacturing activities to high-skilled product research and development organisations. The value-added reshuffling activities are attracting more and more technical and knowledgeable employees to relocate to Penang, enabling the semiconductor industry in Penang to thrive⁶⁷.

Employee retention appears to be a concern and challenge for many semiconductor companies in Penang, where the industry is expected to grow further due to technological advancements³⁷, as well as international economic and political environments^{3,63,91}. One of the most serious concerns is a scarcity of highly technical employees with backgrounds in engineering, technology, and science⁴⁵. It is reported in the Education Ministry's 2020 Annual Report that 47.18% of students in Malaysian universities chose science, technology, engineering, and mathematics (STEM) programmes¹⁴, resulting in a decline in the number of engineers. Some engineers and technicians have chosen to relocate to the neighbouring country of Singapore in search of better pay and working conditions, whilst some may be poached or attracted by other semiconductor companies in Penang due to better salary, company reputation (including brand name), supervisory support, and potential career development. Semiconductor companies continue to struggle in building the diverse, premier workforces needed to meet demand⁸². These phenomena have eventually resulted in hiring difficulties and the ongoing labour shortages in the semiconductor industry in Penang^{60,69}. At the same time, the industry is being challenged by new creations and innovations to improve its value chain in the market, not to mention competing countries like Vietnam that are catching up⁷⁵, all of which necessitate the recruitment and/or retention of talents.

A successful organisation must have the employees to support and deliver their best performance in order to achieve the company goals and earn profit. The organisation is not able to run smoothly without employee contribution⁷². The employment relationship is facing crucial difficulties that are having implications for employee retention, motivation, and attraction that eventually cause intense rivalry²³. It is important that the organisation should focus on managing and

utilising the human resources in the company in order to have long-term achievement. If an organisation is not capable of managing the employees in an effective way, this will have grave consequences, one of which is the employee planning to leave the company¹⁵⁾. In the end, the organisation is forced to bear the cost of turnover. These costs incurred are not only on new hiring but also in losing talented employees who may hold the knowledge and skills that benefit the company⁹⁴⁾.

The remainder of the paper is structured as follows. The following section reviews the literature on employee retention and factors influencing employee retention, resulting in the development of a research framework and a series of hypotheses. The methodology is described next, followed by data analysis and discussion before the paper is concluded.

2. Literature Review

2.1. Employee Retention

The ability of an organisation to retain talented personnel is referred to as employee retention³²⁾. Employee retention has emerged as a critical topic for top management discussion in the current era of globalisation and modernisation²⁴⁾, particularly in terms of organisational performance and growth. Shah and Gregar insist that employers should develop strategies and policies to keep capable and valuable employees from leaving the company⁸⁰⁾. Many researchers have also suggested for the Human Resources Department to consider how to reduce employee turnover and motivate employees to stay with the company for a longer period by developing and implementing relevant programmes and practices^{23,59, 89)}.

Although recruiting valuable and knowledgeable employees is a top priority for organisations, employee retention is even more critical to prevent spending on employee turnover such as new hiring, training costs, loss of productivity, and the like⁵⁰⁾. Thus, retention of employees is critical, especially in the semiconductor industry.

2.2. Herzberg Two-Factor Theory

According to Herzberg's Two-Factor Theory, the success or failure of an organisation is dependent on the motivation of its employees, where organisations cannot function effectively unless their employees are motivated to work. If employees are not motivated in their current jobs, they may develop the intention to leave their companies. Creating a fully motivated workforce is hence the primary focus of management. Employers should monitor their employees, as well as investigate when issues with low motivation arise to minimise the turnover rate⁵⁴⁾.

Employer branding strategy is one of the factors influencing employee retention as mentioned by Herzberg. Good pay, a healthy and flexible work environment, as well as a mature organisational culture are the key elements to building a good employer branding strategy⁶⁵⁾. Morgan insists that organisations should take these elements seriously because they will have an impact on employee retention in the long run⁶²⁾. Employees may not be satisfied working for a company with bad employer branding.

Salary and benefits are part of the elements of the hygiene factors proposed by Herzberg¹³⁾. Many organisations used high pay as a retention tool, which is related to the maintenance but not the motivator factor. Accordingly, the salary level should be reasonable and in line with the market wage level to prevent employees from switching to other companies. In addition, company benefits such as allowance, bonuses, and a medical care plan can also help to retain employees. Studies on employee turnover found that employees are looking for other motivator factors instead of just basic pay. With high pay and good benefits, the dissatisfaction of employees may subside, but the employee will not have an increased level of motivation, retention, and engagement^{7,47,56)}. More than half of the employees prioritised job stability over salary. In

addition to competitive salaries, today's employees want job stability, respect, meaningful work, and a positive work-life balance⁴⁷⁾.

Herzberg also opined that companies should provide opportunities for growth and promotion to capable employees to increase their satisfaction level⁴¹⁾. By providing training and career development, employees will know what position to pursue in the organisation. Besides, employees should have a sense of responsibility for their daily work, and superiors should minimise their control and provide full ownership to their subordinates. All these will result in the employees developing an interest in the job itself, where meaningful and challenging tasks will boost job motivation and satisfaction⁷⁾.

Whilst work flexibility fails to increase the satisfaction of employees, it may result in employee dissatisfaction if the company does not provide a flexible working environment⁴⁰⁾. Organisations should have fair and clear policies in place, such as allowing for flexibility in working hours, dress code, and so on. Employees may feel dissatisfied if the working hours are longer or overtime is requested by management since this may have an impact on their personal lives. Besides, employees will feel that there is less monitoring by their supervisors when working from home, which may reduce the dissatisfaction of employees⁸⁴⁾.

Employee retention can be influenced too by relationships within the company, particularly those between superiors and subordinates⁸⁷⁾. The literature has called for employers to appreciate and recognise the achievements of their employees. Further, to retain employees, supervisors should always be supportive and provide useful advice to them. Management could establish a communication platform for managers and subordinates to share feedback and changes that benefit both parties⁹³⁾.

The five factors (employer branding strategy, salary and benefits, training and career development, job flexibility, and supervisor support) influencing employee retention as derived from the Herzberg's two-factor theory are discussed in the following subsections.

2.3. Employer Branding Strategy

Employer branding strategy is defined as a targeted, long-term strategy to manage the awareness and perceptions of employees, potential employees, and related stakeholders toward a particular firm⁴⁸⁾. Backhaus and Tikoo elucidate that an employer branding strategy is a way for an organisation to differentiate its characteristics as an employer from competitors in the same field¹¹⁾. An organisation should need a good image and branding in order to increase the recruiting and retention of the employees. The applicants are able to know the organisation's perks, company benefits, working environment, and culture if the organisation builds a good employee branding in the public⁷⁴⁾. Promoting company branding, i.e. organisational value and culture, will eventually increase employee loyalty and help to promote the company branding to outsiders to attract potential employees³³⁾.

People working in a strong reputation company are usually more energetic, enthusiastic, and passionate. These employees have a lot of creative ideas and good workmanship standards. These employees are able to work at a feverish pitch and contribute many good ideas to increase the company's productivity. Increasing productivity is directly correlated with increasing sales. In the end, the company's business will grow dramatically and produce high revenue and profit. A high profit and cash flow company will let the employees feel safe and secure in their jobs. The employees will not be concerned about any financial crisis happening in the company^{49,81,85)}. In other words, the attractiveness of an organisation creates a good image in the minds of employees and communicates to potential employees the value of the company and

the potential benefits of working for the organisation¹¹⁾. Hence, it is an effective attraction tool for an organisation in attracting and retaining a skilled and talented workforce.

Nyein and Kohsuwan conducted a study on employer branding strategy using the Herzberg two-factor theory and found that employees preferred working for companies with good employer branding strategies⁶⁵⁾. These companies are those with a clear purpose, culture, and story to communicate to employees what the company is all about. In addition, information about the perks, benefits, working environment, and culture of the company aids in the development of a good employee branding to the public⁷³⁾.

According to the Deloitte-SEMI Workforce Development Survey²⁶⁾, 60% of the respondents surveyed believe that semiconductor companies have poor branding and image in comparison to other technology organisations. About 59% of the respondents also believe that the career path in the semiconductor industry is less appealing than a career in other technology industries²⁷⁾.

Great employee branding could reduce the recruitment and training costs of a company. Although developing good employee branding is not that easy, it is a novel way for employers to promote their organisations in the long run⁹⁾.

2.4. Salary and Benefits

Employers provide monetary or non-monetary rewards to employees based on their work performance^{6,31)}. Monetary rewards such as salaries, bonuses, profit sharing, overtime pay, and allowance are all considered important elements in motivating employees to perform well in their jobs and retaining them in the company^{17,64)}. It is also a factor in their ability to find a job that meets their salary expectations so that they are willing to contribute their skills and abilities to their work⁷³⁾. On the other hand, non-monetary rewards or benefits such as medical healthcare, company trips, company-paid cars, and company training are also some of the factors that influence employee retention^{4,20, 22)}.

According to Herzberg's theory of motivation, people will be dissatisfied if they are paid less based on their educational background instead of their experience or skills³⁹⁾. However, if there is no proper and mutual reward system and benefits, employees will be dissatisfied as well⁴⁵⁾. Competitive salary and pay, as well as a comprehensive reward system, are the elements of motivators in organisations which may eventually lead to employee retention^{5,39,89)}.

An attractive salary and benefits package can entice newcomers whilst sustaining current employees. Besides, giving people a significant raise can easily retain employees in the company as it is a way to provide recognition to employees³⁴⁾.

2.5. Training and Career Advancement Opportunities

Training and career advancement opportunities can be defined as the need for employees to be given the opportunity to gain new knowledge and learn new skills to perform better and advance to a higher position or job responsibility⁷⁰⁾. Delery and Doty define training and career advancement opportunities as the degree of training provided by an organisation to employees to develop their skills²⁵⁾. Training has also been referred to as the development of attitude, knowledge, and skills required by staff to perform their tasks proactively, productively, and effectively. The capability and ability of employees will be developed and established through training and career advancement opportunities, which will have a direct impact on customers¹⁹⁾ and the productivity of an organisation⁵⁵⁾.

Martini and Cavenago⁵⁸⁾ describe career development opportunities as the outcomes of actions on career plans as viewed from both individual and organisational perspectives; as such, career advancement opportunities can be viewed from the standpoints of the employer and employee. Employers always strive to improve the performance and productivity of

employees by providing career advancement and determining the best fit between the staff and the job. On the other hand, employees believe that career advancement is critical for them to improve themselves to receive higher pay or recognition from the organisation^{57,66,83}.

Training and career advancement opportunities have also been identified as a driving force in lowering employee turnover rates, particularly in retaining employees who are eager to learn and gain new knowledge. However, employee retention has become a major issue in the semiconductor industry, where a lack of training that supports emerging technologies has been reported². Many semiconductor companies are unable to keep up with the advancement of new technologies and develop relevant training programmes such as artificial intelligence and autonomous driving⁶⁸. Nonetheless, many semiconductor companies recognised the value of organisational knowledge in employee retention. Many of these companies are supporting internship and apprenticeship programmes, which could enhance the capabilities and abilities of employees to increase their productivity and more importantly to retain them^{57,86}.

2.6. Job Flexibility

Job flexibility refers to changes made by the employer and the employee to make the employees feel that their working style is better and capable of meeting personal and company goals⁷⁸. People are increasingly concerned with work-life balance rather than the amount of money they can earn, placing a premium on flexibility in working hours and environment when choosing or shifting to a new job. According to Richman et al., job flexibility was ranked first amongst all employee benefits by 53% of respondents in HubSpot's 2017 Consumer Omnibus⁷⁸. Similarly, the 2015 Workplace Flexibility Study¹⁸ reported that half of employees ranked job flexibility as one of the critical benefits, whilst 75% of employees ranked job flexibility as the most important aspect of company benefits, ahead of the second element – financial assistance. Hofferth and Curtin found in their study that flexibility in the working environment increases productivity by 75%⁴².

Job flexibility would not be achievable in the absence of technology. Many semiconductor companies operate in multiple locations worldwide^{30,61}. A high-tech networking system and communication tools are required for employees to communicate internally and externally in different locations and time zones. It is not prohibitively expensive for semiconductor companies to invest in communication tools such as WebEx, GoToMeeting, and Zoom, which are currently low-cost and effective tools in the market. Employees can easily adapt and find the most comfortable way to incorporate this working style into their lives, which may eventually improve productivity²¹.

In addition, job flexibility is a valuable recruiting and retention tool in the semiconductor industry. Around 70% of employers will fully utilise 'job flexibility' as a strategy to hire and retain employees. It is also an added advantage for employees with children at home. Besides, 51% of manufacturing employees have requested for their companies to provide job flexibility options.

2.7. Supervisor Support

Supervisor support refers to the relationship between supervisors and subordinates⁵³. Supervisor support includes work-related guidance and advice, performance evaluation, and career development⁸⁸. As a social exchange construct, supervisors and subordinates are expected to develop a good relationship and trust each other¹⁶. Since the relationship between the supervisor and the subordinates is a factor that may contribute to employee dissatisfaction with the job, managers should cultivate relationships with employees to ensure satisfaction⁴¹. Employees who felt valued, respected,

and supported by their supervisors were more likely to express lower intentions of leaving the organisation²⁹). This relationship is important in maintaining a stable workforce within an organisation.

3. Research Framework

Figure 1 shows the research framework of the study. Based on the literature, it proposes that employer branding strategy, salary and benefits, training and career development, job flexibility, and supervisor support may have significant relationships with employee retention in the semiconductor industry.

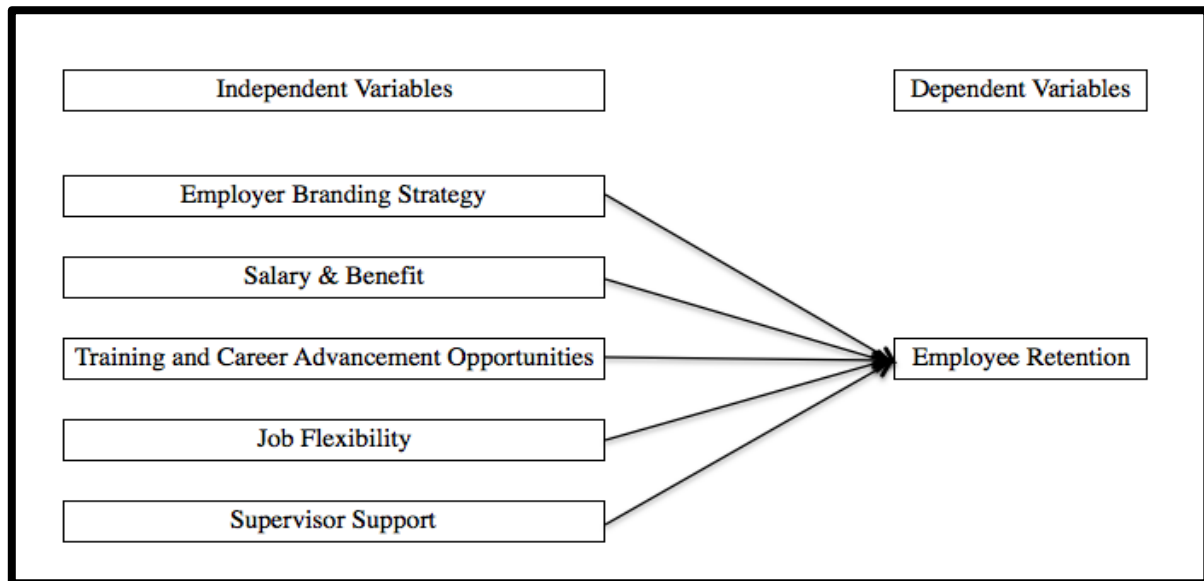


Figure 1. Research Framework

3.1. Research Hypotheses

Based on the research framework (Figure 1), the following hypotheses were developed to be tested in the study:

H1: There is a relationship between employer branding strategy and employee retention in the semiconductor companies.

H2: There is a relationship between salary and benefits and employee retention in the semiconductor companies.

H3: There is a relationship between training and career advancement and employee retention in the semiconductor companies.

H4: There is a relationship between job flexibility and employee retention in the semiconductor companies.

H5: There is a relationship between supervisor support and employee retention in the semiconductor companies.

3.2. Sampling Method

This study focuses on the semiconductor companies in Penang. According to InvestPenang, the semiconductor companies in Penang can be categorised into six sub-divisions, which are electronic components, consumer electronics, industrial electronics, electrical products, electronics manufacturing services, and renewable energy⁴⁴). Table 1 shows the sub-divisions and companies in the semiconductor industry in Penang.

Table 1. Sub-Divisions and Companies in the Semiconductor Industry in Penang

Sub Sectors	Companies
Electronic Components	Intel TF-AMD Broadcom IBIDEN Analog Devices
Consumer Electronics	SONY Panasonic Western Digital DELL SanDisk
Industrial Electronics	BOSCH Motorola Keysight Technologies SAM Engineering ViTrox
Electrical Products	OSRAM B-Braun Abbott Laboratories Flex, Lumileds Tecomet
Electronics Manufacturing Services (EMS)	Plexus Jabil Benchmark Sanmina Inari Amertron
Renewable Energy	Jinko Solar JA Solar

According to Table 1, there are a total of 27 semiconductor companies in Penang. The probability sampling method to be used in this study is simple random sampling, in which the employees of these 27 semiconductor companies have an equal chance of being nominated for participation in the survey. In this study, G*Power was used to calculate the sample size required. Based on the results of G*Power, the total sample size was estimated to be 138 (see Figure 2), with an alpha level (α) of 0.05.

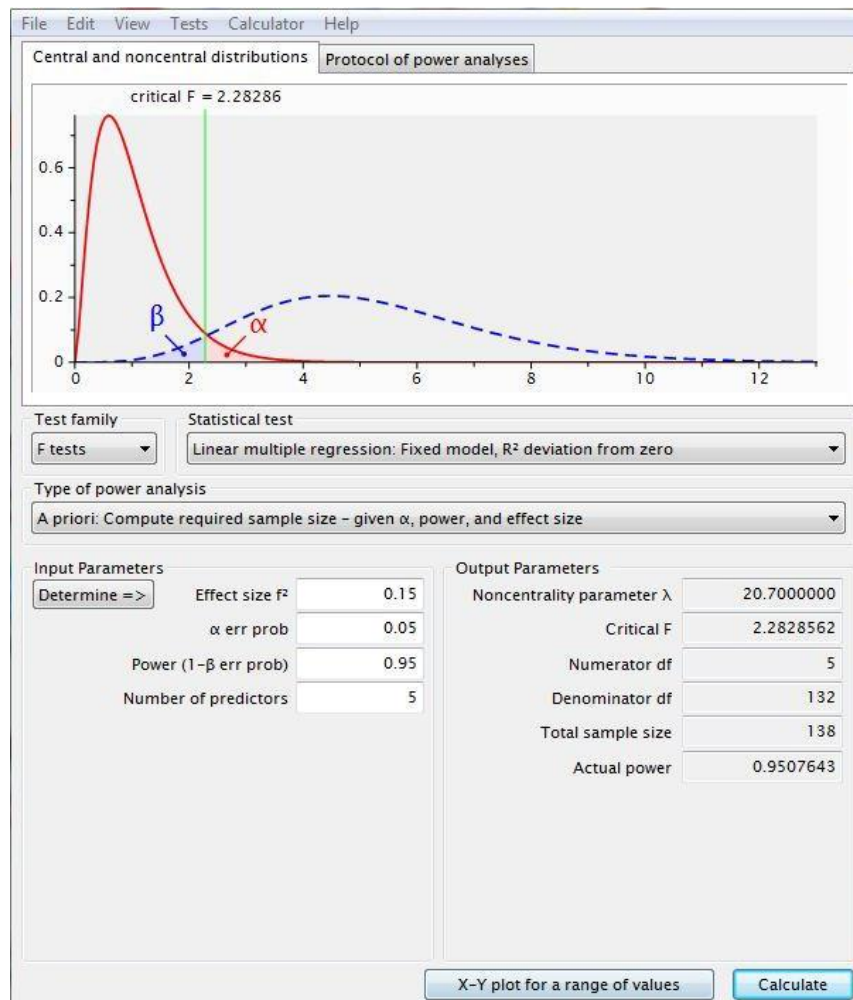


Figure 2. Central and Noncentral Distributions of G*Power

4. Data Collection Method

The research framework depicted in Figure 1 serves as the foundation for developing the survey questionnaire. The draft questionnaire was piloted on 30 employees prior to its actual dissemination. The questionnaire consists of three sections. Section A focuses on collecting demographic information. Section B contains questions on employee retention, whereas Section C comprises questions on the five independent variables. The questionnaire was distributed to respondents who work in the semiconductor companies in Penang (Table 2) through company emails and social media (WhatsApp). A clear consent letter has been established to inform respondents about how their data will be utilised to maintain trust and foster a secure environment for data collection. A total of 152 sets of responses were received within three months. Data was extracted from Google Forms and coded on an Excel sheet before being imported into SPSS tools.

As shown in Table 2, nominal scale was used as a unit of measurement for demographic information in Section A. The questions in Section B and Section C were measured using the 5-point Likert interval scale, i.e., 1 = strongly disagree; 2 = disagree; 3 = no comments; 4 = agree; and 5 = strongly agree. The questions in Section B were adopted from Kyndt et al.⁵²⁾. For Section C, the questions were adapted from various studies, i.e., employer branding strategy^{76, 85)}, salary and benefits¹⁰⁾, training and career advancement opportunities, and supervisor support¹⁵⁾, and job flexibility.

Table 2. Questionnaire Structure of the Study

Section	Number of Questions	Variables	Unit of Measurement
A	9	Demographic Information	Nominal scale
B	11	Employee Retention	Interval scale
C	10	Employer Branding Strategy	Interval scale
	4	Salary & Benefits	Interval scale
	4	Training and Career Advancement Opportunities	Interval scale
	10	Job Flexibility	Interval scale
	8	Supervisor Support	Interval scale

4.1. Data Analysis Methods

The IBM SPSS software was used to analyse the demographic information, whilst the SmartPLS was employed for data analysis. The descriptive statistics, structural equation modelling (SEM), convergent validity, construct validity, factor loading, average variance extracted (AVE), composite reliability, discriminant validity, Cronbach's alpha, and goodness of fit index were presented in the following sections..

5. Results

5.1. Demographics Information Analysis

There was no missing data amongst the 152 responses. Table 3 shows that female respondents made up 53.3% of those polled. The largest group of respondents was between the ages of 26 and 30 (31.6%), followed by those between the ages of 36 and 40 (17.1%). There was only one respondent who was under the age of 20. Half of the respondents have one to five years of experience working in the semiconductor industry, followed by those with relevant work experience ranging from six to 10 years. Only 10 respondents have worked in the semiconductor industry for 21 years or more. Half of those polled were single, followed by those who were married. In terms of academic qualifications, 70.4% of the respondents held a bachelor's degree or equivalent, with only one holding a doctorate degree or equivalent. About 65.8% of the respondents worked 40 to 50 hours per week, with 25.7% working between 51 and 60 hours per week. About 100 respondents have been with their current semiconductor company for one to five years, followed by those between six and 10 years (21.7%) and 11 and 15 years (8.6%). Only four (2.6%) and five (3.3%) respondents have worked for the same company for 16 to 20 years and 21 or more years, respectively. About 48% of respondents earned between RM2,501 and RM5,000 per month, with only 30.9% earning between RM5,001 and RM10,000. Only 2% of them received RM15,001 and more. In terms of job positions, 60.5% were administrators or engineers, followed by 14.5% of operators or technicians, and 11.2% managers in the companies. In addition to the positions listed in the questionnaire, three employees held positions that were distinct from the others, namely officer, sales coordinator, and senior executive.

Table 3. Respondent Profiles

Demographic Information	Characteristics	Frequency	Percentage (%)
Gender	Male	68	44.7
	Female	84	55.3
Age	20 years old and below	1	0.7
	21 – 25 years old	23	15.1
	26 – 30 years old	48	31.6
	31 – 35 years old	24	15.8
	36 – 40 years old	26	17.1
	41 – 45 years old	19	12.5
	46 – 50 years old	0	0.0
	51 years old and above	11	7.2
Work Experience in Semiconductor Industry	1 – 5 years	76	50.0
	6– 10 years	39	25.7
	11 – 15 years	16	10.5
	16 – 20 years	11	7.2
	21 years and above	10	6.6
Marital Status	Single	76	50.0
	Married	74	48.7
	Divorced	2	1.3
Education	Secondary Education (SPM) or the equivalent	21	13.8
	Certificate/Diploma or the equivalent	15	9.9
	Bachelor's Degree or the equivalent	107	70.4
	Master's Degree or the equivalent	8	5.3
	Doctorate Degree or the equivalent	1	0.7
Current Working Hours (Weekly)	40 – 50 hours	100	65.8
	51 – 60 hours	39	25.7
	More than 60 hours	13	8.6
Total Length of Time You Worked in Current Company	1 – 5 years	97	63.8
	6 – 10 years	33	21.7
	11 – 15 years	13	8.6
	16 – 20 years	4	2.6
	21 years and above	5	3.3
Monthly Salary	Below RM 2,500	25	16.4
	RM 2,501 – RM 5,000	73	48.0
	RM 5,001 – RM 10,000	47	30.9
	RM 10,001 – RM 15,000	4	2.6
	RM 15,001 and above	3	2.0
Job Position	Operator / Technician	22	14.5
	Team Lead / Shift Lead	18	11.8
	Administrator / Engineer	92	60.5
	Manager	17	11.2
	Officer	1	0.7
	Sale coordinator	1	0.7
	Senior Executive	1	0.7

5.2. Assessing Reliability and Validity

5.2.1. Cronbach's Alpha

Table 4 shows that the Cronbach's alpha for all the variables were greater than 0.70, which is significant to the research tiles that are considered good.

Table 4. Cronbach's Alpha Statistics from Pilot Test

Construct	Cronbach's Alpha
Employee Retention	0.724
Employer Branding Strategy	0.910
Job Flexibility	0.915
Salary & Benefit	0.814
Supervisor Support	0.830
Training and career Advancement Opportunities	0.854

5.2.2. Convergent Validity

Table 5 shows that there were a total of 47 loadings from the independent and dependent variables. The overall factor loadings were greater than 0.50, indicating that the items were appropriate to be used in this study. Besides, the composite reliability was tested where all the items exceeded the recommended value of 0.70³⁵⁾. All the AVE values were greater than 0.50³⁶⁾.

Table 5. Results of Assessment of the Measurement Model

Construct	Loadings	Composite Reliability	Average Variance Extracted (AVE)
Employer Branding Strategy	0.802	0.948	0.646
	0.770		
	0.798		
	0.766		
	0.823		
	0.822		
	0.797		
	0.798		
	0.805		
	0.852		
Salary & Benefit	0.843	0.917	0.734
	0.855		
	0.859		
	0.869		
Training & Career Advancement Opportunities	0.919	0.943	0.805
	0.904		
	0.890		
	0.874		
Job Flexibility	0.822	0.95	0.655
	0.766		
	0.850		
	0.836		
	0.809		
	0.747		
	0.788		
	0.863		
	0.822		
	0.784		
Supervisor Support	0.79	0.933	0.636
	0.786		
	0.798		
	0.822		
	0.872		
	0.805		
	0.818		
	0.675		
Employee Retention	0.940	0.964	0.714
	0.756		
	0.937		
	0.941		
	0.817		
	0.727		
	0.794		
	0.675		
	0.913		
	0.914		
	0.829		

5.2.3. Discriminant Validity

Table 6 shows that the values in bold were greater than other values, confirming the discriminant validity of the model listed³⁵⁾.

Table 6. Discriminant Validity of Construct

	Employee Retention	Employer Branding Strategy	Job Flexibility	Salary & Benefit	Supervisor Support	Training & Career Advancement Opportunities
Employee Retention	0.845					
Employer Branding Strategy	0.704	0.804				
Job Flexibility	0.343	0.470	0.809			
Salary & Benefit	0.448	0.557	0.425	0.856		
Supervisor Support	0.528	0.648	0.498	0.480	0.798	
Training & Career Advancement Opportunities	0.410	0.574	0.496	0.553	0.556	0.897

5.3. Structural Model

5.3.1. Path Coefficients and Hypotheses Testing

The bootstrapping procedure (500 re-samples)³⁶⁾ was applied to analyse the significance of the hypotheses constructed in this research. The path analysis (standard beta, standard error, and t-value) was employed to test the structural model. As shown in Table 7, amongst the hypotheses, two were supported, which were employer branding strategy ($\beta=0.611$, $p<0.01$) and supervisor support ($\beta=0.138$, $p<0.01$), both of which have positive relationships with employee retention, whereas salary and benefits ($\beta=0.076$, $p<0.01$), training and career advancement opportunities ($\beta=0.045$, $p<0.01$), and job flexibility ($\beta=0.014$, $p<0.01$) were not significant to employee retention. In conclusion, H1 and H5 are supported in this study, whereas H2, H3, and H4 are not supported.

Table 7. Path Coefficients and Hypotheses Testing

Hypotheses	Relationship	Std Beta	Std Error	t-value	Supported
H1	Employer Branding Strategy -> Employee Retention	0.611	0.082	7.501**	Yes
H2	Salary & Benefit -> Employee Retention	0.076	0.099	0.812**	No
H3	Training & Career Advancement Opportunities -> Employee Retention	-0.045	0.090	0.538**	No
H4	Job Flexibility -> Employee Retention	-0.014	0.081	0.242**	No
H5	Supervisor Support -> Employee Retention	0.138	0.087	1.489**	Yes

Notes: ** $p<0.01$, * $p<0.05$

5.3.2. Goodness of Fit Index

Table 8 shows that the GOF index was 0.911, which was between 0 to 1, indicating that it was significant^{38,90}.

Table 8. Goodness-of-Fit Index

Construct	AVE	R ²
Employee Retention	0.714	
Employer Branding Strategy	0.646	
Salary & Benefits	0.734	
Training and Career Advancement Opportunities	0.805	
Job Flexibility	0.655	
Supervisor Support	0.636	
Average Values	4.19	0.198
AVE × R ²	0.830	
GOF = $\sqrt{(AVE \times R^2)}$	0.911	

Besides, in order to evaluate the discrepancy between the observed correlations and the model-implied correlations, the standardised root means square residual (SRMR) is used for this study. Table 9 shows that the SRMR was 0.078, which was lower than 0.08 to 0.10 are considered a good fit⁴³, which signifies that the model's predicted correlations closely match the observed correlations, implying that the model is a good representation of the data.

Table 9. Model Fit Summary

	Saturated Model	Estimated Model
SRMR	0.078	0.078
d_ ULS	6.894	6.894
d_ G	5.668	5.668
Chi-Square	3341.076	3341.076
NFI	0.629	0.629

6. Discussion

Whilst profit maximisation is the goal of every business, companies should place a greater emphasis on their employees and consider how to retain their skilled and talented employees to maintain profit and market position. Based on the results of hypotheses, it can be concluded that employer branding strategy and supervisor support are the significant factors that influence employee retention which are aligned with prior research^{8,29,48}.

Employer branding strategy serves as the first impression of employees or outsiders to understand the organisation. Many successful organisations will always prioritise their employees to ensure the employees are happy working for the company. Many semiconductor companies are beginning to focus on promoting company branding, so many projects have

been implemented to create a good employer branding strategy. A healthy employer branding strategy may influence the behaviour of employees, and employees may seek self-improvement to meet customer requirements. This can eventually lead to increased productivity. Besides, for the human resources department, a good employer branding can help attract and hire experts whilst also increasing employee loyalty to the organisations. As a result of implementing employer branding strategy, there will be a strong intention of employees who are willing to stay in a company.

In addition, superiors serve as representatives of the management team. Employees can be easily motivated when they receive support from their superiors. The managers could always maintain open communication with employees by providing a platform for them to give feedback on issues encountered and provide the necessary advice to employees. The support and respect from superiors can improve the momentum of the working environment and eventually increase the sales of the company. In other words, employees who feel connected and supported by their peers and supervisors are more likely to remain with the organization⁷⁷).

Three variables, namely salary and benefits, training and career advancement opportunities, and job flexibility are not the key elements influencing employee retention in the semiconductor industry, which is opposed to previous studies like Abu Bakar et al.²⁾, Clarke²¹⁾, and Kumar⁵¹⁾. This is probably because the semiconductor industry provides satisfactory salary and benefits, training and career advancement opportunities, and job flexibility to senior and junior workers, making the employees less likely to concentrate on these factors in their careers. Nevertheless, only 9% of employers in the semiconductor industry stated that job flexibility is feasible in their organisations. Although working from home is a popular trend and has become common amongst this generation, it is difficult to implement job flexibility in the semiconductor industry because many of the workers are operators, technicians, and engineers who need to be on the production floor to complete the job²⁷⁾.

7. Implications

The semiconductor organisations could enhance their employer branding strategy to current employees and even outsiders to maintain a strong reputation and image in the eyes of the public. Besides, supervisors should provide support by listening to the concerns expressed by subordinates and assisting employees in resolving the issue.

The findings of this study could contribute to the semiconductor industry in Penang since there has been little research on the subject. Employers could use the findings as a guideline to effectively retain employees by making some changes within the organisation. The findings of this study also provide data for the Penang government on the current employee retention issue in the semiconductor industry, allowing the state government to implement more useful programmes in the factory area.

8. Conclusion

Since its establishment as a free trade zone in 1972, Penang has become a rapidly growing economy with an increasing demand for skilled talent. Today, employer branding and supervisor support have become the strategic tools used to attract people and create interest in companies. The semiconductor companies should focus on these factors to increase their level of sustainability and competitiveness.

In this study, data collection was a challenge due to poor responses from the semiconductor industry employees. Further, some of the respondents might not answer the questionnaire accurately if they did not understand the current practices in

their organisations that were covered in this research. Besides, the respondents are from different educational backgrounds, years of working experiences, marital status, and positions, therefore, it may influence the results of the study.

Since the independent variables were based on the empirical literature, there may be other factors that could be included in future studies. Besides, this study also can be conducted by focusing on demographics as moderating variables and covering millennials or minorities only. Comparative analysis is also possible to confirm the results. This study only captured the quantitative data, hence qualitative data may be included in future studies to enable a deeper understanding of the antecedents of employee retention.

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ORIGINAL ARTICLE

Characteristics of the Educational Status of Special Education Schools for the Physically Disabled in South Korea; Through Text Mining Analyses of School Goals and School Evaluations

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ABSTRACT

The purpose of this study is to investigate the characteristics of the educational status of special education schools for the physically disabled by analyzing text data on school goals and school evaluations in special schools for the physically disabled nationwide in South Korea. As a result of analysis, regarding the school goals and school evaluations of 21 special education schools for the physically disabled nationwide, the noun word that appeared most often in the school goals was “Student” and the adjective word was “Healthy.” The verb word was “Develop.” The noun word that appeared most frequently in the school evaluation of curriculum organization and operation was “Student” and the adjective word was “Educational.” The verb word was “Be.” The noun word that appeared most frequently in the school evaluation of the classes was “Student,” and the adjective word was “Various.” The verb word was “Be.” In conclusion, the school goals for physical disabilities were focused on improving the health of students with physical disabilities, and school evaluations appeared to focus on the individual curriculum for students with physical disabilities. In the future, it will be necessary to investigate the current status of special education for students with physical disabilities according to the degree of disability.

Keywords: Physically disabled, special education schools, 2022 special education curriculum, school goals, school evaluations

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1. Introduction

In Korean education, the paradigm of the special education curriculum is changing from “Given alternative curriculum” to “Student-customized curriculum.” The Ministry of Education confirmed and announced the revised special education curriculum on December 22, 2022. Recently, as the number of students with severe disabilities among students eligible for special education is increasing, this revised curriculum defines a customized curriculum that considers the student's disability characteristics and educational needs and specifies in detail the target of application of the basic curriculum¹⁾. The special education curriculum consists of a general curriculum, a kindergarten curriculum, a common curriculum, a selection-oriented curriculum, and a basic curriculum. Among these, it is reported that the basic curriculum is the one that most reflects the uniqueness of special education²⁾. The basic curriculum of special education develops a level-specific curriculum with content linked to real life, focusing on core competencies necessary for life in the community, so that each disabled student can smoothly cope with future daily life and occupational activities³⁾. The Ministry of Education reported that it established a basic curriculum system, established a new subject called activities of daily living for students with severe disabilities, and strengthened curriculum support for integrated education, improving the curriculum to be customized for students with content related to real life¹⁾.

On the other hand, according to the 2023 special education statistical survey published by the Ministry of Education, there is no significant numerical change in the number of special education recipients with physical disabilities in South Korea, which will be 9,522 (8.7%) out of 109,703 in 2023, compared to 9,639 (9.3%) out of 103,695 in 2022⁴⁾. Nevertheless, the number of students with physical disabilities in South Korea is the second highest after intellectual disability, autistic disorder, and developmental delay, and among students with two or more severe disabilities, it is reported that students with physical disability and intellectual disability are the most numerous⁵⁾. It is reported that there are seven definitions of physical disabilities: A person with a physical disability is a person who has a permanent disability in the function of one arm, one leg, or torso, a person who has lost the thumb of one hand above the phalangeal joint, or a person who has lost all two or more fingers, including the second finger of one hand, above the first phalanx joint, a person who has lost one leg above the transverse ankle joint, people who have lost all toes on both feet, a person who has lost the function of the thumb of one hand, or a person who has lost the function of two or more fingers, including the second finger of one hand, a person who is severely short due to dwarfism or who has significant deformities or deformities in their spine, and a person who is recognized as having a physical disability greater than or equal to one of the above items⁶⁾.

In the case of special education targeting students with physical disabilities, it is necessary to consider not only support for improving physical activity functions in daily life but also the learning ability and disability characteristics of students due to the severity and overlap of disabilities. In addition, it is very necessary for special education schools for the physically disabled to organize and operate a curriculum to respond to the characteristics of students with disabilities⁷⁾. However, it has been reported that it is very difficult to organize a curriculum for the majority because physical disabilities have a wide range of types or causes and are characterized by diversification of severity and duplication in students with disabilities⁸⁾. Therefore, in order to fulfill individualized education for students with physical disabilities, it is reported that each school needs to build an educational environment so that learners can independently design the curriculum on what and how to learn based on their career path and aptitude⁹⁾. Regarding the customized education according to learner tendencies proposed by the Ministry of Education in the 2022 revised curriculum, it has not yet been clearly investigated whether special education schools for the physically disabled are presenting school goals and obtaining school evaluations accordingly.

Meanwhile, in general, the most important principle of learning design means reducing various obstacles that appear when learning, and it must be successfully applied to students in educational goals, and educational evaluations¹⁰⁾. In order to essentially implement the learning process, the school must set school goals that reflect the needs of school members and society, operate the curriculum by establishing the composition and completion system of subjects, and conduct school evaluations focusing on students' performance processes and results. It is reported that students' capabilities can be strengthened as a result¹¹⁾. In addition, the school goals and school evaluations of these educational institutions serve as standards for teachers to carry out daily educational activities or provide direction, structure, and evaluation in carrying out educational activities¹²⁾. However, no study has ever been conducted to characterize the school goals and school evaluations of special education schools for the physically disabled using text mining analyses, and there has yet to be a study examining whether these characteristics are related to the newly revised special education curriculum. Therefore, the purpose of this study is to investigate the characteristics of the educational status of special schools for the physically disabled in South Korea by objectively analyzing the school goals and characteristics of school evaluations in special schools for the physically disabled nationwide through text mining analyses.

2. Materials and Methods

2.1. Special education schools for the physically disabled

This study analyzed 21 special education schools for the physically disabled nationwide as listed in the 2023 special education statistics published by the Ministry of Education ⁴⁾. The specific schools' name is (1) Hankuk Woojin School, (2) Seoul Narae School, (3) Seoul Jeongmin School, (4) Seoul Saerom School, (5) Yonsei University Rehabilitation School, (6) Jumong School, (7) Busan Hyenam School, (8) Daegu Sungbo School, (9) Daegu Bogun School, 10) Incheon Eunkwang School, (11) Eunhye School, (12) Daejeon Seongsae Rehabilitation School, (13) Gwangju Saerom School, (14) Myeonghye School, (15) Hansarang School, (16) Cheongju Hyehwa School, (17) Sungdeok School, (18) Nazarene Saeggum School, 19) Dongam Chadol School, (20) Jeonbuk Pureun School, (21) Jeju Youngji School (Table 1).

2.2. Primary outcomes

2.2.1. School goals of special education schools

In this study, only the specific school goals related to student achievement were set as primary outcome measures among the school goals published on the website of each special education school for physical disabilities.

2.2.2. School evaluations of special education schools

In this study, school evaluation data called "School Evaluation Reports" were downloaded from the homepage of each special education school for the physically disabled. In addition, if the school evaluation reports could not be downloaded from the schools' website, "School Evaluation Indicators and Comprehensive Evaluation Opinions" was downloaded through the information disclosure site (so-called School Information)¹³⁾ of elementary schools, middle schools, and high schools nationwide established in accordance with the Elementary and Secondary Education Act. The qualitative reports and implications regarding the items of 'curriculum organization and operation' and 'classes and evaluation innovation' listed in the school evaluation reports were set as school evaluations. Those who evaluated classes and evaluation innovation were students' parents, and teacher and staff of the schools.

2.3. Text data analysis

Regarding the analysis of school goals and school evaluations, we conducted an analysis of unstructured text data through text mining to determine the characteristics of special education schools for the physically disabled nationwide. Text mining is an analysis technique that extracts useful information from text data. It is used in various academic fields because it builds text data (the preprocessing process) and extracts information that is not specified in the original text through text data analysis¹⁴⁾. KH Coder version 3 Beta 07 was used as analysis software. High-frequency keywords were extracted only from nouns, adjectives, and verbs through the extracted word list. Cases where the keyword appeared less than five times were excluded from the results of this study. Additionally, the connections between frequently related keywords were visualized through co-occurrence network analysis.

3. Results

3.1. Number of teachers and students in special education schools for physical disabilities

Among the 21 special education schools, one school did not have an elementary school and one school did not have a high school. The schools with the largest number of teachers, including elementary, middle and high schools, were Daegu Sungbo School (85), Seoul Jeongmin School (77), and Jeju Youngji School (73). The schools with the largest number of students were Daegu Sungbo School (233), Jeju Youngji School (203), and Seoul Jeongmin School (178).

Table 1. Number of teachers and students in special education schools for physical disabilities nationwide in 2023

	Schools	Teachers			Students			
		Elementary School	Middle & High School	Total	Elementary School	Middle School	High School	Total
1	Hankuk Woojin School	23	37	60	80	31	37	148
2	Seoul Narae School	16	31	47	53	23	23	99
3	Seoul Jeongmin School	27	50	77	84	46	48	178
4	Seoul Saerom School	14	9 *	23	36	21	-	57
5	Yonsei University Rehabilitation School	12	17	29	43	20	23	86
6	Jumong School	17	29	46	78	41	40	159
7	Busan Hyenam School	23	27	50	75	33	36	144
8	Daegu Sungbo School	33	52	85	117	59	57	233
9	Daegu Bogun School	16	24	40	52	21	29	102
10	Incheon Eunkwang School	10	21	31	32	27	39	98
11	Eunhae School	28	33	61	88	29	45	162
12	Daejeon Seongsae Rehabilitation School	8	14	22	21	22	16	59
13	Gwangju Saerom School	11	15	26	36	17	3	56
14	Myeonghye School	-	30	30	-	36	40	76
15	Hansarang School	22	14	36	54	19	17	90
16	Cheongju Hyehwa School	12	18	30	26	16	19	61
17	Sungdeok School	13	20	33	44	24	24	92
18	Nazarene Saegum School	21	14	35	64	15	22	101
19	Dongam Chadol School	9	26	35	47	36	27	110
20	Jeonbuk Pureun School	10	23	33	48	23	35	106
21	Jeju Youngji School	28	45	73	90	65	48	203

* This number refers to the number of middle school teachers only.

3.2. School goals regarding students in special education schools for the physically disabled

Among the school goals, the school goals related to student are as shown in Table 2. The positioning of school goals took the form of detailed goals for students in the form of descriptions of comprehensive school goals and policies to achieve them (Table 2).

Table 2. Specific school goals for students in special education schools for physical disabilities

Schools		Specific school goals for students
1	Hankuk Woojin School	Self-directed students who have the basic abilities and qualities necessary for their lives and careers; Students who process and utilize various information to solve rational problems; Students who conversely utilize knowledge, skills, and experiences in various fields; Students discovering and enjoying the meaning and value of life; Students who express their thoughts and feelings effectively and respect the opinions of others; Students who actively participate in community development with the values and attitudes required of local, national and global community members
2	Seoul Narae School	Healthy students with basic living habits; Students with good character who are considerate and cooperative; Students who open up the future by nurturing dreams and talents
3	Seoul Jeongmin School	Healthy students with basic lifestyle habits, Sincere students who overcome obstacles and adapt to society, and students who cooperate by nurturing dreams and dreams and exploring career paths
4	Seoul Saerom School	To nurture students who learn and grow while developing their individuality and talent through diverse and rich experiences; To nurture students who live together who can respect and communicate with each other while nurturing their dreams in the local community; To nurture students who have healthy bodies and minds through the harmonious development of the body and good character
5	Yonsei University Rehabilitation School	Students who overcome obstacles with a positive mind and sense of purpose; Students who think creatively and develop their own specialties and talents; Students who develop self-reliance and a sense of community in daily life
6	Jumong School	Students with different lifestyles, Students who develop their talents and aptitudes, and Students who are physically and mentally healthy
7	Busan Hyenam School	Students with good character; Students who are physically and mentally healthy; Students exploring careers
8	Daegu Sungbo School	Students who achieve healthy and independence and learning and growth
9	Daegu Bogun School	Students who can create new things and solve problems in an integrated way; Students who actively challenge new environments and strive for self-realization; Students who express themselves in a hyper-connected society based on empathy and understanding and respect others; Students who practice a happy life with community values and attitudes
10	Incheon Eunkwang School	A healthy person overcoming a disability; A person who live righteously and help each other; A person who develops talent and ability; A person who adapts through experience
11	Eunhae School	A person who understands disabilities and strive to improve basic living skills; A person who live together with respect for themselves and others; A person who grows as member of society by developing career paths and aptitudes; Intellectually/Physically/emotionally harmonious person
12	Daejeon Seongsae Rehabilitation School	Cultivation of communication skills with good character, practice of basic etiquette, keeping orders and rules; Development of basic motor skills, development of basic physical strength development of health/hygiene habits, development of ability to adapt to group life, development of ability to adapt to various environments, strengthening of career/vocational education, Formation of basic living habits, development of personal handling skills, development of daily life expression skills, provision of a pleasant educational environment, operation of student-centered educational activities, ties between parents and community
13	Gwangju Saerom School	Students who strive to improve their living skills; Students who enjoy learning and practicing; Students who develop their future dreams and develop their ability to express themselves
14	Myeonghye School	Balanced student with a loving and cooperative attitude and nurturing self-reliant people through character education activities based on the Catholic view of education
15	Hansarang School	Those who strive to improve their senses and motor skills; Those who manage their own work; Those who strive to express their opinions; Those who have basic life skills; Those who enjoy leisure and develop their talents
16	Cheongju Hyehwa School	Students who have grown harmoniously into active members of society
17	Sungdeok School	Students with basic habits and abilities necessary for daily life; Students with a healthy mind and body who know joy; Students with self-reliance capable of social integration; Students who grow by helping each other
18	Nazarene Saeggum School	Students who learn and practice hard; Students who love themselves and consider others; Students with good character
19	Dongam Chadol School	Raising healthy people whose minds and bodies are harmoniously developed by overcoming and improving disability; Raising self-sufficient people who handle their own work by acquiring new knowledge and skills; As a member of a community that aims for a welfare society, raise a polite person whose love themselves and their neighbors
20	Jeonbuk Pureun School	Keep your body and mind healthy by exercising; Acquire academic background and develop talents and specialties; Achieve your dream with a strong will to overcome obstacles; Develop talents and acquire independent living skills; Cultivate good character and practice love with neighbors
21	Jeju Youngji School	Students with healthy mind and body; Students who develop their talents; Students dreaming of self-reliance

3.2.1. Results of keyword appearance frequency count

In the preprocessing stage, the number of all extracted words (use) counted from the school goals was 774 (515), and the number of words (use) counted by distinguishing lexical words was 219 (197). Table 3 shows the results of the number of words that appear more than 5 times. Among noun words, words appeared in the order of “Student,” “Skill,” and “Person,” and among adjective words, words appeared in the order of “Healthy,” “Basic,” and “Good.” Among verb words, words appeared frequently in the order of “Develop,” “Learn,” “Nurture,” and “Strive” (Table 3).

Table 3. Extracted 19 words and frequency count

	Noun	Frequency	Adjective	Frequency	Verb	Frequency
1	student	42	healthy	11	develop	12
2	skill	11	basic	9	learn	5
3	person	9	good	6	nurture	5
4	talent	9			strive	5
5	life	8				
6	character	7				
7	community	7				
8	development	7				
9	body	6				
10	mind	6				
11	ability	5				
12	living	5				

3.2.2. Analysis results of the co-occurrence network

Moreover, as a result of conducting the co-occurrence network, the potential co-occurrence relationships of the extracted words were divided into a total of eight subgraphs, as shown in Figure 1. As a characteristic of school goals, the eight subgraphs were given the following titles (Table 4). The title of the first subgraph can be said to be “Qualities and abilities required as members of society” for students with physical disabilities, and keywords such as “Skill,” “Strive,” and “Nurture” were found. The title of the second subgraph is “Independent community life” for students with physical disabilities, and keywords such as “Basic,” “Community,” and “Development” were found. The title of the third subgraph can be said to be “Living in harmony with disability” for students with physical disabilities, and keywords such as “Person,” “Disability,” and “Live” were found. The title of the fourth subgraph can be said to be “Problem solving ability” of students with physical disabilities, and keywords such as “Express,” “Problem,” and “Solve” were found. The title of the fifth subgraph is “Education about body movements” for students with physical disabilities, and keywords such as “Educational,” “Practice,” and “Activity” were found. The title of the sixth subgraph can be said to be “Students developing their talent,” and keywords such as “Student,” “Develop,” and “Talent” were found. The title of the seventh subgraph can be said to be “Good character,” and keywords such as “Good” and “Character”. Finally, the title of the eighth subgraph can be said to be “Physicality and Mentality,” and the keywords “Physically,” “Mentally,” and “Be” were found (Figure 1).

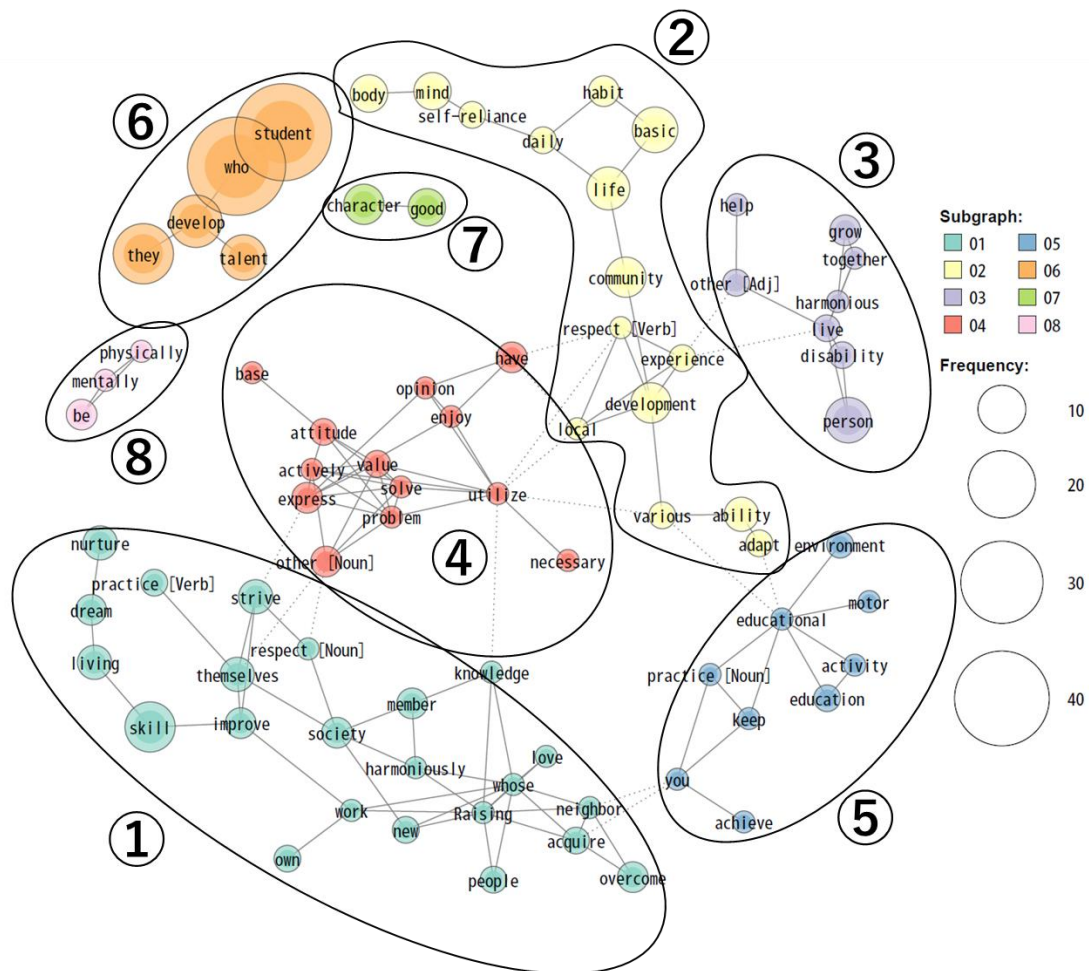


Figure 1. Subgraph classification in co-occurrence networks about specific school goals for students

Table 4. Titles of 8 subgraphs

Subgraph title	
1	Professional knowledge and training required to become a member of society
2	Independent community life
3	Living in harmony with disability
4	Problem solving ability
5	Education about body movements
6	Students developing their talent
7	Good character
8	Physicality and Mentality

3.3. School evaluations regarding students in special education schools for the physically disabled

Table 5 summarizes the evaluation of the organization and operation of the curriculum and the evaluation of the classes in special education schools for the physically disabled.

Table 5. Evaluation of the organization and operation of the curriculum and the classes in special education schools for physical disabilities

Schools		Evaluation of the organization and operation of the curriculum	Evaluation of the classes
1	Hankuk Wooin School	In COVID-19, the curriculum was organized and operated to reflect the needs of students and the characteristics of the school.	Our school shares individualized education plans, achievement evaluations, and life guidance information to help students adapt at the beginning of the semester and strives for student growth through regular consultation with the Individualized Education Support Team. The teacher frequently shared the student's performance with the guardian and supported the student's growth through this.
2	Seoul Narae School	We organize a school curriculum that suits the characteristics of our students and operate a curriculum for each class that meets the characteristics of the class and the needs of the students (rehabilitation, water/sensory exercise, class-specific activities, etc.). A variety of systematic career-related programs were operated in connection with curriculum and CEA.	Through the Individualized Education Support Team Council and parent consultations, we establish and operate an individualized education plan that reflects the characteristics of each student and the needs of parents. Efforts were made to provide evaluations that support student growth through restructuring achievement standards appropriate for the characteristics of students with physical disabilities and severe or multiple disabilities and evaluating them through class observations.
3	Seoul Jeongmin School	Through parental consultation and consultation with the Individualized Education Support Team, we establish and operate an individualized education plan that reflects the characteristics of students and the needs of parents. A curriculum including basic lifestyle habits and character education was organized and operated, and efforts were made to cooperate between families and schools to enhance character education.	Efforts were made to provide evaluations that would help students grow and develop through class observations. We conducted classes in which students could participate happily by utilizing various communication methods that reflected the students' characteristics, assistive technology devices, textbooks, and teaching aids.
4	Seoul Saerom School	We organized and operated a curriculum that matched the characteristics of the school, the needs of its members, and the development of students' future capabilities. We also utilized a variety of learning materials that took the individual differences of students into account. Career education was revitalized by operating career education activities that reflected students' interests and aptitudes, job understanding, and parents' demands in connection with CEA and the free grade system.	All teachers actively participated in teaching research activities to strengthen teaching capabilities and improve teaching. We operated various small group activities, such as teacher learning communities, to enhance teachers' expertise.
5	Yonsei University Rehabilitation School	We have formed and operated an individualized education support team and systematically established educational plans, implemented classes, recorded evaluations, and provided results based on students' characteristics and parents' needs. Using the curriculum and CEA, we organized picture exchange communication, sensory integration, five sense play, exploration activities, electric wheelchairs, book play, etc. that fit the characteristics of our school and operated a school curriculum suitable for students with physical disabilities. In order to reorganize the curriculum for practical learning, village instructors with expertise were utilized, and in connection with various experts in the community, we prepared for adaptation to the community after graduation and various social participation activities. We provide a variety of career education programs that consider each student's talent, aptitude, and future, as well as vocational education to help students learn the basic skills and attitudes required in various job fields so that they can live as members of the community.	Research and sharing were actively carried out through course-specific consultations and the operation of teacher learning communities. The curriculum was reorganized for student growth, and evaluations (performance, observation, and regular exams) tailored to each student were conducted. The fairness of attendance management and evaluation was enhanced through deliberation by the Academic Performance Management Committee; evaluation plans and standards were disclosed in advance, and the objection period was faithfully operated.
6	Jumong School	An individualized education plan was established and implemented that took into account the educational needs of special education students. We operate a customized career and vocational education course to strengthen the future life capabilities of disabled students.	A variety of student participation classes and cooperative learning-centered classes are conducted. Considering the type and characteristics of disability, we operate a variety of process-based evaluation methods, subjects, and periods. The fairness of evaluation was improved by effectively operating the Academic Performance Management Committee.
7	Busan Hyenam School	By operating a customized curriculum that reflects the educational needs of individual students and a curriculum centered on life skills needed in real life, class participation improved and school goals were achieved.	Character education was set up as a special project of the school, and a character program was operated that took into account the chronological age of each school level to cultivate good character. Through the medical support project, a systematic and effective medical support system was established for medical support needs, and special health care support was provided. Students' cultural and artistic experiences were expanded by attracting a variety of high-quality performances such as puppetry, dance, and theater. We created a fun and safe school environment and strengthened safety education and safety training. The e-sports intramural athletic competition provided students with confidence, a sense of accomplishment, and satisfaction.
8	Daegu Sungbo School	Through the integrated design of curriculum-class-evaluation-records and the operation of the reflection week, efforts were made to integrate curriculum-class-evaluation-records based on individual curriculum plans to help students grow and develop and the level, characteristics, and future of individual students. We were able to establish an individualized education plan centered on subjects and life that reflects life priorities.	We worked to revitalize school culture and arts education and received positive evaluations by operating a positive behavior support program.

9	Daegu Bogun School	To improve students' social adaptability, a program utilizing community resources was effectively operated. Experience-centered educational programs with the local community were systematically operated. Efforts were made to identify students' career paths and occupational characteristics through vocational evaluations. We operate a variety of career and job experience programs that take into account the type and degree of a student's disability, aptitude, and specialties.	We strived to cultivate good character through practice-oriented character education. A character education plan tailored to the school's unique characteristics was implemented in a substantial manner. He worked hard to cultivate good character, such as respecting his parents and the elderly.
10	Incheon Eunkwang School	Individualized education for each subject is appropriately operated considering the current level of students. Individual support programs for after-school educational activities and on-campus programs were well-run, reflecting the needs of students and parents who were surveyed in advance at the beginning of the semester.	Gaps in learning due to COVID-19 were minimized through in-person classes, remote classes, and the provision of alternative learning materials for students who were absent.
11	Eunhae School	The type and characteristics of the student's disability and the needs of the parents were actively reflected through consultation, and an individualized education plan was established focusing on the burden of the homeroom teacher. We understand the level of students learning and plan and operate a curriculum appropriate for individual needs. We share students' needs during curricular activities with teachers of the same grade and make joint efforts to provide teaching and learning activities appropriate for them.	We provided students with a variety of career and job information and career counseling and utilized the human and material resources of the local community to operate the 'College Life Experience Program for Students with Disabilities' to provide students with a variety of information and experience opportunities. Through connections with various external organizations and the invitation of professional instructors, various career experiences and opportunities for individual students to explore their careers were provided. The career activity room and career counseling room were renovated to increase the use of vocational education equipment, operate various career programs, and provide stable career counseling. Career counselors conducted individual and group career counseling with students and parents to listen to students' career concerns and provide appropriate career coaching.
12	Daejeon Seongsae Rehabilitation School	Despite many restrictions on educational activities due to COVID-19, efforts were made to try various educational methods and improve teacher expertise. Special projects for each curriculum were operated for each course. In order to encourage diverse experiences and the self-development of students, we operate a curriculum focusing on play that develops the five senses in elementary schools, a creative career education free grade system in middle schools, an intensive career education grade system in high schools, and a 3-UP independent education program in major departments. In order to enhance the expertise of teachers, it has been of great help in teaching classes to new and low-experience teachers by operating class research club, various consulting scholarships, on-campus mentoring scholarships, autonomous scholarships, and class openings. Through various cultural arts education, students' potential abilities were discovered, which contributed to improving self-confidence, fine motor skills, and character and interpersonal skills.	Through classes utilizing the school library, students are provided with opportunities to improve their ability to search for information and their self-directed learning attitude, and school-autonomous reading education is provided through reading festivals, school book report contests, reading libraries, library use education, and color story classes. Reading education was strengthened through the program.
13	Gwangju Saerom School	Considering student growth, curriculum reorganization, classes, evaluation, and records were carried out systematically and consistently. A variety of evaluation methods were implemented to ensure students' holistic growth and true academic advancement. In accordance with COVID-19 response guidelines, we disinfect the school and respond quickly when confirmed cases occur to prevent group infections. Through school announcements, students were instructed to remember to ventilate the classroom, wash their hands, check their temperature, and wear masks.	Appropriate feedback was provided according to the evaluation results to resolve the student's academic achievement gap and learning difficulties. The class emphasized learner initiative and cooperation. Equitable learning was supported by restructuring the sensory integration and experience-centered classes needed for students with severe and multiple disabilities through a curriculum practice based on teacher cooperation classes.
14	Myeonghye School	Subject councils, departmental councils, teacher workshops, and department head workshops were used to build plans among teachers, and existing classes and tasks were assessed and taken into consideration while making plans for the upcoming school year. Parents' opinions on significant topics related to the curriculum and operations of the school were gathered through a survey of parents. We made every effort to give pupils career education so they could become independent, and we worked to maintain continual contact between teachers and parents for the sake of the students.	Various topic encounters were used to foster collaborative and creative mindsets. Through the curriculum reconstruction project class, I gained the interpersonal and social skills required to interact with others and communicate while resolving issues within the same grade. We created classes that offer students real-world learning opportunities by redesigning the curriculum. We established a body-mind balance based on fundamental knowledge through a variety of experiences, as well as an attitude of empathy and cooperation with others. The emphasis on PE and health-related activities was to participate in a range of activities with the aim of boosting self-esteem and giving students a sense of accomplishment via exercise.
15	Hansarang School	According to the student's level and disability characteristics, it was run as a moderate and overlapping disability curriculum. It also featured a personalized education program that represented the students' educational needs through imaginative experiential activities.	According to the student's level and disability characteristics, it was run as a moderate and overlapping disability curriculum. It also featured a personalized education program that represented the students' educational needs through imaginative experiential activities.
16	Cheongju Hyehwa School	There was a change in the positive perception of school members regarding the operation of the professional learning community, and there was a lot of useful training through the professional learning community this year.	There was a change in the positive perception of school members regarding the operation of the professional learning community, and there was a lot of useful training through the professional learning community this year.

17	Sungdeok School	By collaborating with similar organizations, regional restrictions on career experience were broadened. Instead of concentrating just on enhancing social and professional skills, a variety of occupational skills were developed, including knowledge of the law, etiquette, and human rights. Opportunities for career experience were expanded for students eligible for special education in the transition period through subsidies for career vocational education focused curriculum and youth business school.	Activities in the ukulele club gave parents a chance to interact and lessened the strain of parenting. Children's direct exposure to job experience activities through career vocational club activities boosted their trust in school instruction. Many families took part in the family support program thanks to the parents' association's strong support.
18	Nazarene Saeggum School	The demands and needs of school members were reflected in the organization and operation of the school curriculum. The curriculum was reorganized to suit the characteristics of each grade and subject. A school curriculum was implemented that takes advantage of regional characteristics and the material and human resources of the community. A curriculum reflecting core competencies was organized and operated.	We conducted student-centered classes and classes that fostered collaborative learning and tried to ensure that no student was left out by providing a variety of learning opportunities tailored to students' talents and specialties. The growth process of each student was observed and recorded. Career education tailored to the student's developmental stage was provided.
19	Dongam Chadol School	Individualized education is based on school conditions and student levels. It was done with this in mind. The school curriculum was faithfully implemented according to the academic schedule.	Teaching and learning methods for each subject were provided to suit the characteristics of the subject. Students were appropriately guided to develop the correct basic lifestyle habits. Each student's problems were identified, appropriate measures were established, and guidance was provided in connection with the home.
20	Jeonbuk Pureun School	By implementing more than 100% of the 7 types of safety education classes for students, all students were able to cultivate safety awareness and make safety a part of their daily lives through various educational activities such as field trips, curriculum, training activities, and fire drills.	According to the plan to open classes to all teachers at least three times a year, classes are made public to parents and fellow teachers, and the quality of teaching and learning is improved through council meetings, increasing trust and satisfaction among students and parents, and expanding opportunities for class research for teachers themselves.
21	Jeju Youngji School	In order to provide educational activities that meet the educational needs of students with severe and multiple disabilities, the curriculum and time were reduced, and the number of CEA increased. A free semester system centered on career exploration activities, topic selection activities, arts and sports activities, and club activities was operated for second-year middle school students. It was implemented in a variety of ways to suit the characteristics of students, such as by course, grade, disability area, and class, reflecting the curriculum, regional characteristics, school conditions, and student and parent needs.	Before conducting field experience learning, we identified the dangerous areas and travel routes of destinations and transit points in advance and conducted safety guidance in a systematic and planned manner. We also tried to make safety awareness a part of daily life by repeating safety education on a regular basis through CEA.

3.3.1. School evaluation of curriculum organization and operation

3.3.1.1. Results of keyword appearance frequency count

In the preprocessing stage, the number of all extracted words (use) counted from the school evaluation of curriculum organization and operation was 1,497 (915), and the number of words (use) counted by distinguishing lexical words was 399 (359). Table 6 shows the results of the number of words that appear more than 5 times. In nouns, words appeared in the order of “Student,” “Curriculum,” and “Education,” and in adjectives, words appeared in the order of “Educational,” “Various,” and “Individual.” Among verbs, words appeared frequently in the order of “Be,” “Operate,” and “Reflect” (Table 6).

Table 6. Extracted 33 keywords and frequency count

	Noun	Frequency	Adjective	Frequency	Verb	Frequency
1	student	40	educational	12	be	45
2	curriculum	27	various	7	operate	21
3	education	24	individual	6	reflect	10
4	school	22	creative	5	make	8
5	activity	20	individualized	5	implement	7
6	characteristic	15			organize	6
7	need	15			establish	5
8	career	12			take	5
9	class	11				
10	parent	9				
11	plan	9				
12	program	9				
13	community	8				
14	teacher	8				
15	disability	7				
16	variety	7				
17	effort	6				
18	grade	6				
19	life	6				
20	skill	6				
21	experience	5				

3.3.1.2. Analysis results of the co-occurrence network

As a result of conducting the co-occurrence network, the concurrent relationships of the extracted words were divided into a total of eight subgraphs, as shown in Figure 2. As a result of reviewing eight subgraphs as characteristics of school evaluations for curriculum organization and operation, the following titles were presented (Table 7). First of all, the title of the first subgraph can be said to be “Creative and diverse experiences and activities,” and keywords such as “Activity,” “Career,” and “Variety” were found as specific features. The title of the second subgraph is “Discovering students’ career aptitude through learning,” and keywords such as “Utilize,” “Vocational,” and “Evaluation” were found. The title of the third subgraph can be said to be “Implementation of curriculum considering individual characteristics,” and keywords such as “Student,” “Curriculum,” and “Education” were found as specific features. The title of the fourth subgraph can be said to be “A teacher who develops students’ talents,” and keywords such as “Develop,” “Enhance,” and “Focus” were found as specific features. The title of the fifth subgraph can be said to be “Suitable for the region,” and keywords such as “Regional” and “Suit” were found. The title of the sixth subgraph can be said to be “Individual and group learning,” and keywords such as “Community,” “Member,” and “Learning” were found. The title of the seventh subgraph can be said to be “Organizing and operation of individualized plans,” and keywords such as “Individualized,” “Plan,” and “Effort” were found as specific features. The title of the eighth and final subgraph can be said to be “Accumulation of various specialized knowledge,” and the keywords “Expertise,” “Skill,” and “Experience” were found as specific features (Figure 2).

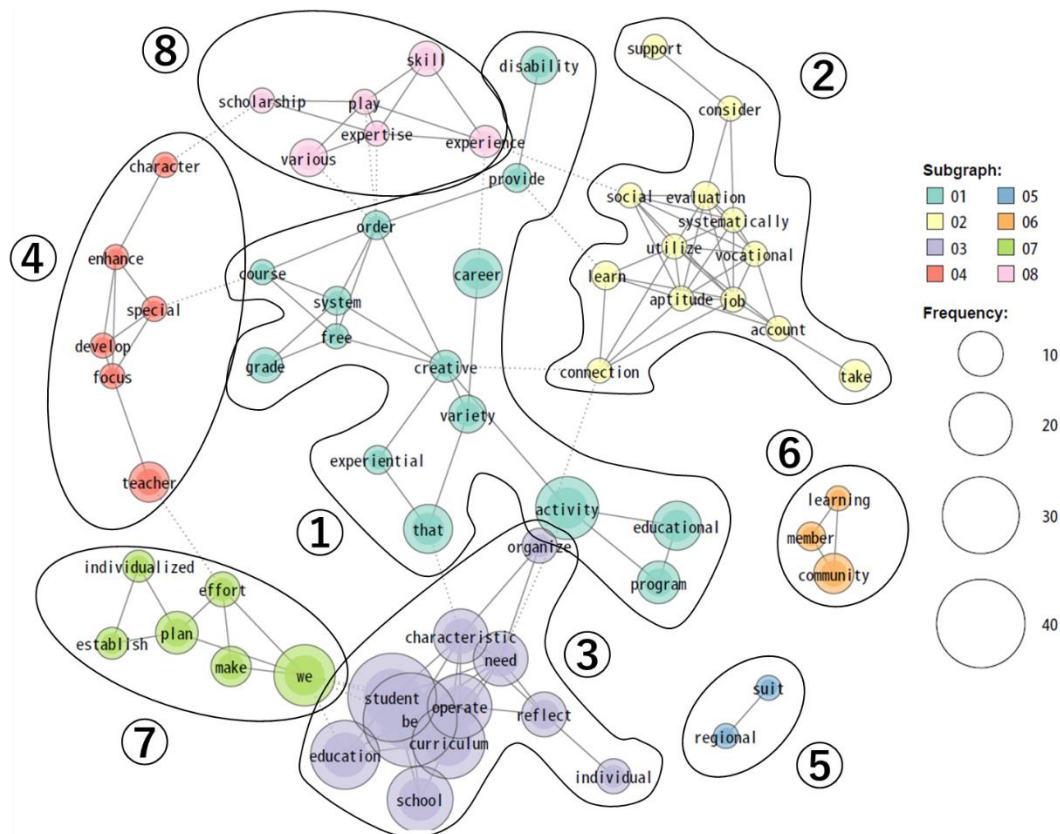


Figure 2. Subgraph classification in co-occurrence networks about evaluation of the curriculum

Table 7. Titles of 8 subgraphs

Subgraph title	
1	Creative and diverse experiences and activities
2	Discovering students' career aptitude through learning
3	Implementation of curriculum considering individual characteristics
4	A teacher who develops students' talents
5	Suitable for the region
6	Individual and group learning
7	Organizing and operating an individualized plan
8	Accumulation of various specialized knowledge

3.3.2. School evaluation of classes

3.3.2.1. Results of keyword appearance frequency count

In the preprocessing stage, the number of all extracted words (use) counted from the school evaluations of the classes was 1,280 (800), and the number of words (use) counted by distinguishing lexical words was 401 (361). Table 8 shows the results of the number of words that appear more than 5 times. In nouns, the words "Student," "Class," and "Evaluation" appeared most frequently. In adjectives, the word "Various" appeared most frequently. Among verbs, words appeared frequently in the order of "Be," "Provide," and "Operate" (Table 8).

Table 8. Extracted 30 keywords and frequency count

	Noun	Frequency	Adjective	Frequency	Verb	Frequency
1	student	36	various	6	be	40
2	class	19			provide	16
3	education	15			operate	9
4	career	12			conduct	7
5	activity	10			learn	7
6	evaluation	10				
7	school	10				
8	support	9				
9	teacher	9				
10	learning	8				
11	parent	8				
12	character	7				
13	characteristic	7				
14	experience	7				
15	program	7				
16	variety	7				
17	disability	6				
18	opportunity	6				
19	teaching	6				
20	community	5				
21	curriculum	5				
22	growth	5				
23	plan	5				
24	safety	5				

3.3.2.2. Analysis results of the co-occurrence network

As a result of conducting the co-occurrence network, the concurrent relationships of the extracted words were divided into a total of 21 subgraphs, as shown in Figure 3. As a result of reviewing 21 subgraphs as characteristics of school evaluations of classes, the following titles were presented (Table 9). First of all, the title of the first subgraph can be said to be “Individualized education and support counseling,” and keywords such as “Activity,” “Career,” and “Variety” were found as specific features. The title of the second subgraph is “Use information,” and keywords such as “Utilize,” “Vocational,” and “Evaluation” were found. The title of the third subgraph can be said to be “Topic development method,” and keywords such as “Subject,” “Method,” and “Develop” were found as specific features. The title of the fourth subgraph can be said to be “Need and level,” and keywords such as “Need” and “Level” were found as specific features. The title of the fifth subgraph can be said to be “Various participation,” and keywords such as “Various” and “Participate” were found. The title of the sixth subgraph can be said to be “Become a student,” and keywords such as “Student” and “Be” were discovered independently. The title of the seventh subgraph is “Academic performance management through committee,” and keywords such as “Academic,” “Committee,” and “Fairness” were found as specific features. The title of the eighth subgraph can be said to be “The sense of creating and accomplishing projects,” and the keywords “Project,” “Accomplishment,” and “Sense” were found as specific features. The title of the ninth subgraph can be said to be “Cultivate good character,” and the keywords “Character,” “Cultivate,” and “Good” were found as specific features. The title of the

tenth subgraph can be said to be “Individual counseling room,” and the keywords “Individual,” “Counseling,” and “Room” were found as specific features. The title of the eleventh subgraph can be said to be “Cooperate to resolve,” and the keywords “Cooperation,” “Base,” and “Resolve” were found as specific features. The title of the twelfth subgraph can be said to be “Boost through interaction,” and the keywords “Interact,” “Give,” and “Boost” were found as specific features. The title of the thirteenth subgraph can be said to be “Actively enhance,” and the keywords “Actively” and “Enhance” were found as specific features. The title of the fourteenth subgraph can be said to be “Reading at the library,” and the keywords “Library” and “Read” were found as specific features. The title of the fifteenth subgraph can be said to be “Expand satisfaction,” and the keywords “Satisfaction” and “Expand” were found as specific features. The title of the sixteenth subgraph can be said to be “Experiential,” and the keywords “Experiential” and “Also” were found as specific features. The title of the seventeenth subgraph can be said to be “Career and job,” and the keywords “Career” and “Job” were found as specific features. The title of the eighteenth subgraph can be said to be “Stability and systemization,” and the keywords “Safety” and “Systematic” were found as specific features. The title of the nineteenth subgraph can be said to be “Medicine and special,” and the keywords “Medical” and “Special” were found as specific features. The title of the twentieth subgraph can be said to be “Family and club,” and the keywords “Family” and “Club” were found as specific features. Finally, the title of the 21st subgraph can be said to be “Fostering Student Collaboration,” and the keywords “Collaborative” and “Foster” were found as specific features (Figure 3).

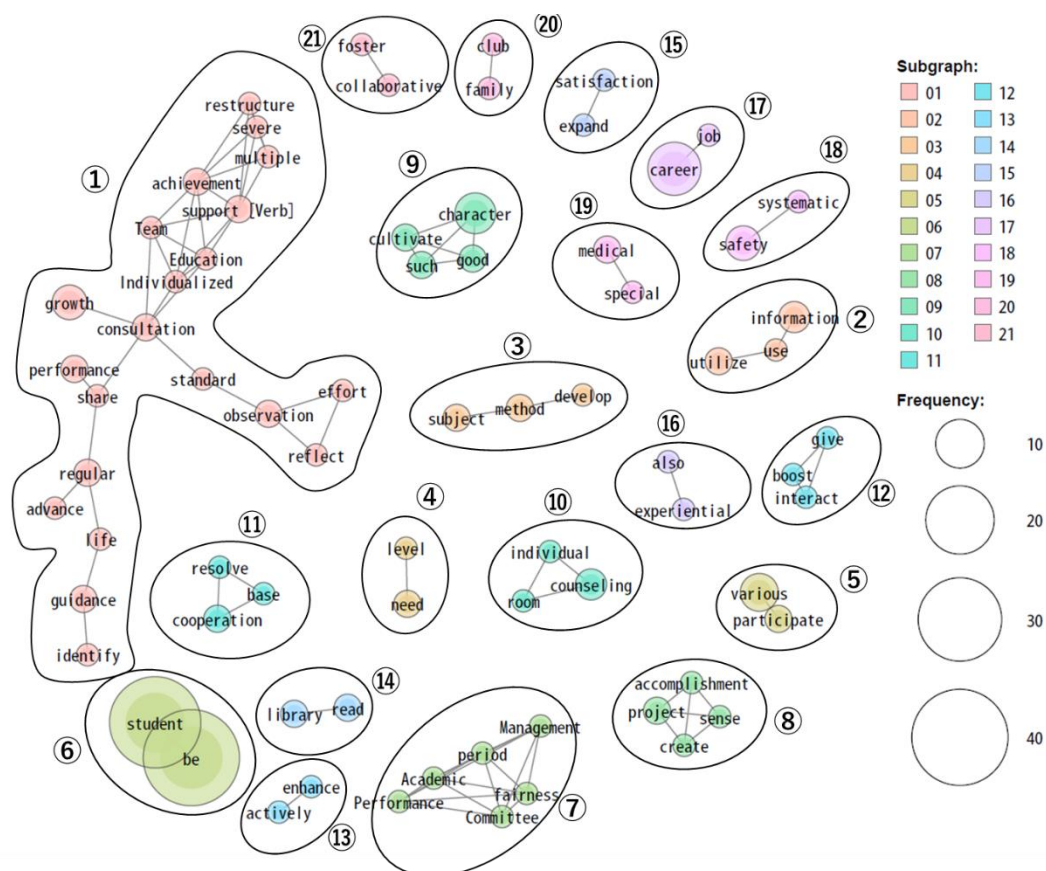


Figure 3. Subgraph classification in co-occurrence networks about evaluation of the curriculum

Table 9. Titles of 21 subgraphs

Subgraph title	
1	Individualized education and support counseling
2	Use information
3	Topic development method
4	Need and level
5	Various participation
6	Become a student
7	Academic performance management through committee
8	The sense of creating and accomplishing projects
9	Cultivate good character
10	Individual Counseling Room
11	Cooperate to resolve
12	Boost through interaction
13	Actively enhance
14	Read at the library
15	Expand satisfaction
16	Experiential
17	Career and job
18	Stability and systemization
19	Medicine and special
20	Family and club
21	Fostering student collaboration

4. Discussion

The study investigated the characteristics of education status of special education schools for the physically disabled by analyzing text data on school goals and school evaluations in special education schools nationwide for the physically disabled in South Korea. As a result of the analysis of school goals, most schools presented specific school goals for students. The noun word that appeared most frequently in school goals was “Student,” the adjective word was “Healthy,” and the verb word was “Develop.” In addition, as a result of co-occurrence network analysis, a total of eight characteristics indicated in school goals: (1) Professional knowledge and training required to become a member of society, (2) Independent community life, (3) Living in harmony with disability, (4) Problem solving ability, (5) Education about body movements, (6) Students developing their talent, (7) Good character, and (8) Physicality and Mentality. The noun word that appeared most often in relation to curriculum organization and operation was “Student,” the adjective word was “Educational,” and the verb word was “Be.” As a result of co-occurrence network analysis, a total of eight characteristics indicated in school evaluations: (1) Creative and diverse experiences and activities, (2) Discovering students’ career aptitude through learning, (3) Implementation of curriculum considering individual characteristics, (4) A teacher who develops students’ talents, (5) Suitable for the region, (6) Individual and group learning, (7) Organizing and operating an individualized plan, and (8) Accumulation of various professional knowledge. Regarding the school evaluations of the classes, the noun word that appeared most often was “Student,” the adjective word was “Various,” and the verb word was “Be.” As a result of co-occurrence network analysis, a total of 21 characteristics indicated.

To the best of our knowledge, this is the first study to investigate the educational status of special education schools for the physically disabled in South Korea by analyzing text data on the school goals and school evaluations of the special education schools for the physically disabled. This study was able to visualize characteristics of school goals and school evaluations of special education schools for the physically disabled in South Korea.

In the results of this study, excluding “Student,” which appeared most frequently in the school goals of special education schools for the physically disabled, the next most frequent noun word was “Skill.” It was suggested that improving students' skills is of utmost importance as a school goal for special education schools for the physically disabled in this study. The majority of children with cerebral palsy attending special education schools for the physically challenged have physical limitations because they have motor disabilities due to brain damage. Therefore, it was found that special schools for the physically disabled were providing specific skills based on professional knowledge about the physical disabilities in all classroom environments, including physical education, and this result was consistent with previous research^{15,16}). In the physical education curriculum for special education announced by the Ministry of Education, it is reported that students with physical disabilities aim to improve their quality of life by applying the skills acquired from the characteristics of exercise and sports areas to their daily lives¹⁷). Moreover, considering that “Healthy” and “Development” showed similar frequencies as “Skill” in this study, it is possible that the school goals for students in special education schools for physical disabilities were focused on the health of students with physical disabilities. The results were consistent with previous studies in that there was a possibility of focusing on developing physical activities and exercise areas that considered the characteristics of the disability¹⁸).

In this study, eight characteristics of school goals for students with physical disabilities were presented. The Ministry of Education emphasized that each region's schools are responsible for organizing and operating special education subjects, and reports that subjects should be designed to reflect the characteristics of each school level. The Ministry of Education also improved the subject of creative experiential activities (CEA) in the 2022 revised special education curriculum into learning content that promotes student-centered activities. In addition, Activities of Daily Living (ADL) is a new subject established in 2022 in consideration of the uniqueness of special schools and the characteristics of each student's disability¹). The two subjects are reported to have a complementary relationship with other required subjects⁹). In the case of creative experiential activities in elementary schools, specific school goals focus on forming basic lifestyle habits and exploring and discovering individuality and talents. CEA in middle school focus on establishing self-identity and exploring one's career path. It is reported that CEA in high school focus on establishing a sense of community, cultivating practical skills for living together, and designing and preparing for career paths¹⁷). In the case of daily life activities, school goals for each elementary, middle, and high school are not set. By developing students' remaining abilities and potential, students understand themselves and their surroundings and cultivate life adaptation skills necessary for present and future life. It also aims at an attitude of living together as an active member of society in the community¹⁷). Most of the special education schools in this study were elementary, middle, and high schools, and had the same characteristics about school goals with “Professional knowledge and training required to become a member of society,” “Independent community life,” “Problem solving ability,” and “Education about body movement.” In other words, special education schools for the physically disabled may be implementing a curriculum of CEA and ADL with the goal of becoming independent as community members. Students with physical disabilities have significant differences in physical function and intellectual ability, so there are many difficulties in developing and applying a curriculum suitable for their characteristics and needs. It has been

reported that CEA provide opportunities for students with physical disabilities to improve their physical motor skills, apply social rules, and promote communication, and also promote social integration through community participation¹⁹⁾. The characteristics of the school's goals for physical disabilities in this study were consistent with the direction of the newly revised special education curriculum^{1,9,17)}, and it is possible that customized individual education for students with physical disabilities is being implemented.

The words that appeared most frequently in the school evaluations of the organization and operation of the curriculum in this study were “Student,” “Educational,” and “Be.” In addition, the noun words that appeared most frequently in the school evaluations of the classes were “Student,” “Various,” and “Be.” Considering these two school evaluations results, it is thought that the school provides a variety of educational programs to students. According to Park et al. (2017), Because teachers focus on explaining knowledge as accumulated results to students through subject education, they report that there is a lack of awareness in terms of field application or implementation of the need for students to learn independently²⁰⁾. In this study, one of the characteristics of the school evaluations of the curriculum organization and operation of a special education schools for the physically disabled is “Creative and diverse experiences and activities,” “Implementation of curriculum considering individual characteristics,” and “Organizing and operating an individualized plan.” The characteristics of the school evaluations of the classes included “Individualized education and support counseling,” “Various participation,” and “Experiential.” Considering these results, it is thought that a variety of curriculums are provided and that individualized education plans are being evaluated for organizing and operating, so it is thought that student-tailored curriculum is being implemented more smoothly than in the past. In addition, as characteristics of school evaluations for curriculum organization and operation, “Individual and group learning”, and as characteristics of school evaluations of classes, “Topic development method,” “Various participation,” “The sense of creating and accomplishing projects,” and “Cooperation to resolve”, “Boost through interaction”, “Experiential”, and “Fostering student collaboration”. It is possible that this result was influenced by CEA centered on experiential activities that have a complementary relationship with other subjects and ADL centered on activities that promote self-directed lives by enhancing students’ ability to adapt to life. In addition, one of the characteristics of school evaluations for curriculum organization and operation was “Discovering students’ career aptitude through learning” and “Accumulation of various specialized knowledge,” and as a characteristic of school evaluations of classes, “Career and job.” It is reported that CEA also include self-understanding activities that help learners understand their interests and aptitudes, as well as career awareness and exploration activities that explore and recognize various occupations¹⁷⁾. It is possible that organizing the curriculum including these subjects led to job-related evaluations of students. However, as a characteristic of the school evaluations of the classes in this study, no characteristics related to the specific subject were found. In the case of special physical education, according to Kim et al., there are various difficulties in achieving educational achievement due to the degree and type of disability of students with physical disabilities, differences in individual motor ability and physical development, school facilities and equipment, and limitations of the curriculum²¹⁾. The subjects of this study were the special education schools that educates students with physical disabilities without distinguishing between degrees of disability, and it is possible that a positive school evaluation was not obtained because physical disabilities are accompanied by various difficulties in physical activity compared to other areas of disability.

On the other hand, other characteristics of school evaluations for classes included “Academic performance management through committee” and “Family and club.” According to Jeong et al. (2012), as the relationship between parents and

special education teachers becomes increasingly difficult, parents believe that teachers will be negligent in their children's education because of their responsibility for evaluation reports and results, whereas there is a reason why teachers evaluate students' remaining abilities by focusing on social and emotional development rather than basic academic ability²²⁾. In the results of this study, it is considered that parents are actively participating in classes because they were evaluated for managing academic performance through an academic performance management committee that included parents.

There is some limitation of this study. First, school evaluation of classes is not by students who took the class, but by parents and faculty. Second, because this study does not address school goals and school evaluations for students with multiple disabilities who have physical disabilities, it is difficult to generalize the results. In the future, there is a need to investigate the special education for students with physical disabilities according to the degree of disability, and the method of investigation also needs to be considered.

5. Conclusion

The school goals of South Korea's special education schools for the physically disabled were found to focus on improving the health of students with physical disabilities and their independence as community members. It was suggested the schools was evaluated positively for providing a variety of curriculum and organizing and operating an individualized education plan in the school evaluation of the organization and operation of the curriculum and the school evaluation of the classes. In addition, it was suggested that students' career and vocational abilities were receiving positive evaluations. In the future, there is a need to clearly investigate the status of special education in special schools for physical disabilities according to the degree of disability by considering the survey method.

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REVIEW ARTICLE

Mobile App-based Interventions for Patients with Noncommunicable Diseases in Japan: A Scoping Review

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ABSTRACT

Noncommunicable diseases (NCDs) emerged as a persistent challenge to be addressed globally. The use of mobile apps has increased and their effectiveness – alongside the effectiveness of traditional face-to-face interventions – has been reported for patients with NCDs. However, there exist no integrated studies of mobile app-based interventions for patients with NCDs in Japan, and the current status and challenges remain unclear. Therefore, in order to provide a basis for developing mobile app-based education and intervention for patients with NCDs in Japan, this review aimed to identify and overview the status of mobile app-based interventions for patients with NCDs in Japan. The PubMed, Scopus, and Ichushi-Web electronic databases were searched for reports published till March 29, 2023, without language restrictions. The study characteristics, the intervention's main results, and the app content were extracted and synthesized. A total of 814 reports were identified, of which 8 ultimately met the inclusion criteria. The app content included self-monitoring, goal setting, counseling, education, feedback, and others. The findings revealed that intervention improved patients' clinical parameters and medication adherence. As the theory related to behavior change has not been used to design interventions in most studies, developing theory-based interventions is required in the future.

Keywords: Noncommunicable diseases, mobile apps, Japan

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1. Introduction

Noncommunicable diseases (NCDs) are a collective term for chronic diseases associated with modifiable behaviors, such as unhealthy diet, physical inactivity, tobacco use, and harmful use of alcohol¹⁾. NCDs include a wide range of diseases, including cardiovascular disease and diabetes, which typically require prevention and appropriate control, mainly through lifestyle changes such as diet and exercise¹⁾. NCDs account for approximately 74% of all deaths globally¹⁾ and exemplify a significant economic burden²⁾. In Japan, 85% of all deaths are attributed to NCDs³⁾ and, therefore, must be considered one of the priority issues to be addressed.

Against this background, the widespread use of digital technology in recent years, alongside traditional face-to-face interventions, has led to the use of mobile health, which provides health services to patients using mobile devices, mainly in the form of smartphone apps⁴⁾. In this context, mobile apps collect data from a variety of sources, including medical devices and wearable devices, which are then integrated into smartphone-based apps to help promote healthy behaviors in patients through monitoring and advice⁵⁾. Mobile apps constitute a promising approach to disease management for patients with NCDs⁶⁾, providing personalized support anytime, anywhere, and facilitating communication with healthcare providers (HCPs)⁷⁻¹⁰⁾.

Previous studies concerning mobile app-based interventions for patients with NCDs have shown significant improvements in blood pressure^{8,11)} and blood glucose levels¹²⁾, ameliorated medication adherence^{11,13)}, and reduced rehospitalization rates¹⁴⁾. These mobile apps included features such as self-monitoring, reminders, automatic feedback, and education to encourage lifestyle changes, while the interventions varied from using the apps alone, to remote monitoring and regular coaching or consultation by HCPs^{8,11-14)}.

Conversely, in Japan, although there are some reports on mobile app-based interventions for patients with NCDs such as hypertension and diabetes, there exist no studies that have integrated multiple information and findings. Within the nation of Japan, apps have recently been treated as a type of medical device, and apps for smoking cessation and hypertension treatment are covered by insurance¹⁵⁾. Therefore, it is expected that mobile apps will become increasingly popular for more efficient and effective treatment. This means that the evidence pertaining to mobile app-based interventions for patients with NCDs in Japan is currently being developed, while it is also thought that the content of mobile app-based interventions and their effects are not sufficiently clear.

Therefore, we considered it necessary to summarize the current status of mobile app-based interventions for patients with NCDs in Japan so as to provide a basis for the development of mobile app-based education and interventions for patients with NCDs in the aforementioned country. Additionally, we decided to focus on NCDs such as hypertension and diabetes, especially considering the disease structure in Japan¹⁶⁾.

Therefore, this review aimed to identify and overview the status of mobile app-based interventions for patients with NCDs in Japan.

2. Methods

2.1. Overview

A scoping review summarizes the published literature on mobile app-based interventions implemented in patients with NCDs in Japan. The review was conducted using the framework developed by Arksey and O'Malley¹⁷⁾ and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)¹⁸⁾.

2.2. Research question and search strategy

This study pertains to the following research question: “What is known about mobile app-based interventions for patients with NCDs in Japan?” Therefore, three electronic databases, PubMed, Scopus, and Ichushi-Web (ver. 5), were used to search for literature from the publication date to March 29, 2023, with no language restrictions. The reference lists of the included studies were hand searched. In this study, NCDs were defined as “diabetes,” “hypertension,” “cardiovascular disease,” and “liver disease” based on the views and data of the Ministry of Health, Labor and Welfare¹⁹⁾, the Japan Lifestyle-related Disease Prevention Association²⁰⁾, and the Japanese Association of Preventive Medicine for Adult Disease²¹⁾. The main search terms were (“Diabetes Mellitus” OR “Hypertension” OR “Cardiovascular Diseases” OR “Liver Diseases”) AND “Mobile Applications”. The search also included terms which were similar to the aforementioned main search terms. For PubMed and Scopus, the key term “Japan” was included. The full search strategy is shown in Figure 1. The identified studies were managed in EndNote20, and duplicates were extracted and removed before the screening.

Database name	Search strategy	Number of hits
PubMed	<p>(((((Diabetes Mellitus[MeSH Terms]) OR (((("Diabetes Mellitus"[Title/Abstract]) OR (Diabetes[Title/Abstract])) OR (DM[Title/Abstract])) OR (diabetic*[Title/Abstract])) OR ((Hypertension[MeSH Terms]) OR (((Hypertension*[Title/Abstract]) OR ("High blood pressure*[Title/Abstract]) OR (HT[Title/Abstract])) OR (HBP[Title/Abstract])) OR (hypertensive[Title/Abstract])) OR ((Cardiovascular Diseases[MeSH Terms]) OR (((("Cardiovascular Disease*[Title/Abstract]) OR (CVD[Title/Abstract])) OR ("myocardial infarction"[Title/Abstract]) OR (MI[Title/Abstract])) OR ("heart attack*[Title/Abstract]) OR (angina[Title/Abstract])) OR ((Liver Diseases[MeSH Terms]) OR (((("Liver Disease*[Title/Abstract]) OR ("Hepatic disease*[Title/Abstract]) OR ("alcohol liver disease*[Title/Abstract]) OR ("non alcoholic fatty liver disease"[Title/Abstract]) OR (ALD[Title/Abstract])) OR (NAFLD[Title/Abstract]))))</p> <p>AND</p> <p>((Mobile Applications[MeSH Terms]) OR (((((((("mobile app*[Title/Abstract]) OR ("smartphone app*[Title/Abstract]) OR ("portable electronic app*[Title/Abstract]) OR ("portable software app*[Title/Abstract]) OR ("phone app*[Title/Abstract]) OR ("cellphone app*[Title/Abstract]) OR ("mobile health"[Title/Abstract]) OR (mHealth[Title/Abstract]) OR (m-health[Title/Abstract]))))</p> <p>AND</p> <p>((japan[MeSH Terms]) OR ((japan) OR (japanese)))</p>	62
Scopus	<p>(((TITLE-ABS-KEY ("diabetes mellitus") OR TITLE-ABS-KEY (dm) OR TITLE-ABS-KEY (diabetic*) OR TITLE-ABS-KEY (diabetes)) OR ((TITLE-ABS-KEY (hypertension*) OR TITLE-ABS-KEY ("high blood pressure") OR TITLE-ABS-KEY (ht) OR TITLE-ABS-KEY (hbp) OR TITLE-ABS-KEY (hypertensive))) OR ((TITLE-ABS-KEY ("cardiovascular disease*") OR TITLE-ABS-KEY (cvd) OR TITLE-ABS-KEY ("myocardial infarction") OR TITLE-ABS-KEY (mi) OR TITLE-ABS-KEY ("heart attack*") OR TITLE-ABS-KEY (angina))) OR ((TITLE-ABS-KEY ("liver disease*") OR TITLE-ABS-KEY ("hepatic disease*") OR TITLE-ABS-KEY ("alcohol liver disease*") OR TITLE-ABS-KEY ("non alcoholic fatty liver disease") OR TITLE-ABS-KEY (ald) OR TITLE-ABS-KEY (nafld))))</p> <p>AND</p> <p>((TITLE-ABS-KEY ("mobile app*") OR TITLE-ABS-KEY ("smartphone app*") OR TITLE-ABS-KEY ("portable electronic app*") OR TITLE-ABS-KEY ("portable software app*") OR TITLE-ABS-KEY ("phone app*") OR TITLE-ABS-KEY ("cellphone app*") OR TITLE-ABS-KEY ("mobile health") OR TITLE-ABS-KEY (mhealth) OR TITLE-ABS-KEY (m-health)))</p> <p>AND</p> <p>((ALL (japan) OR ALL (japanese)))</p>	323
Ichushi-Web (ver. 5)	Omitted because the search strategy is written in Japanese	429

Fig 1. Search strategy

2.3. Study selection and charting of the data

The selection process comprised two steps: (1) reviewing titles and abstracts and (2) reviewing the full text. First, the titles and abstracts of all the articles were screened according to the relevance and inclusion criteria. Second, the full texts of the articles were read and reviewed for eligibility based on the inclusion criteria. We included adult patients (18 years and older) diagnosed with NCDs as defined in this study and intervention studies that reported the mobile app content. Peer-reviewed scientific articles that used quantitative methodologies were included. Case reports, editorials, commentaries, and reviews were excluded. Data extraction was performed using an Excel spreadsheet based on the content suggested by Arksey and O'Malley¹⁷⁾. The sheet included the author, title, year of publication, study design, patient's disease, sample size, mean age, sex, intervention duration, intervention methods, other devices used, the theory and technique used, app content, and main effects of the intervention.

2.4. Charting, summarizing, and reporting the results

The included studies were summarized using descriptive methods to determine their quantity and scope. Further, the contents of the extracted mobile apps were organized.

3. Results

3.1. Study selection

The literature search generated 814 reports. After removing duplicates, the titles and abstracts of 759 reports were screened. Of these, 744 reports that did not meet the inclusion criteria were excluded. The full text of the remaining 15 reports was screened. Of these, seven reports met the inclusion criteria, and a hand search of the reference lists of the included studies identified one report. Finally, eight reports were included in this review²²⁻²⁹⁾, six of which were published in English^{22-26,29)}, with two published in Japanese^{27,28)}. The study selection process is shown in Figure 2.

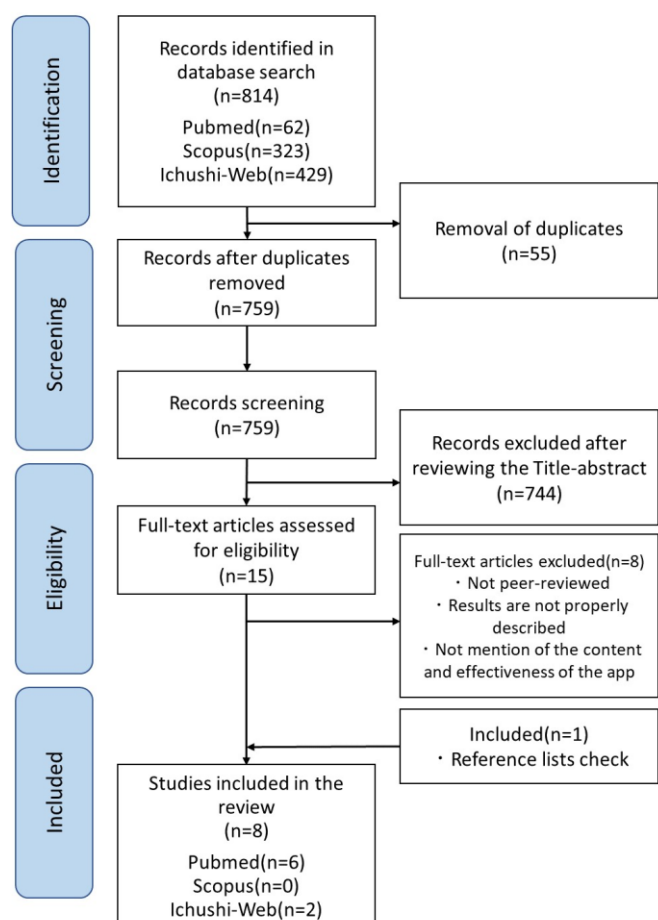


Fig 2. Study selection process

3.2. Characteristics of included studies

Of the eight included studies, one was published in 2014²⁹⁾, while the others were published after 2021²²⁻²⁸⁾. Two studies adopted randomized controlled trials (RCTs)^{23,29)}, three adopted single-arm trials^{24,26,27)}, and the other three adopted observational studies^{22,25,28)}. Four studies were conducted related to diabetics²⁶⁻²⁹⁾, and one study each was performed on patients with multiple lifestyle-related diseases²²⁾, essential hypertension²³⁾, nonalcoholic steatohepatitis²⁴⁾, and atrial fibrillation²⁵⁾. The studies reported the mean age ranging from 52.2 to 67.8 years in the intervention group. All studies reported sex, with a percentage of 12.2 to 47.4% females in the intervention group. The intervention period was from one to six months. The number of participants in the intervention ranged from 10 to 199. The interventions have reported effects on patients' clinical parameters and self-reported measures. The results were examined according to the diseases of the target patients. Three of the four studies in patients with diabetes showed improvement in HbA1c levels^{26,28,29)}; one study revealed no improvement in HbA1c levels but in HDL-Cholesterol levels²⁷⁾. A study regarding lifestyle-related diseases in patients showed improved blood pressure, body weight, and salt intake²²⁾. Another study in patients with essential hypertension indicated improvements in systolic blood pressure²³⁾. A study regarding nonalcoholic steatohepatitis in patients revealed improved liver-related NAFLD activity scores and histological and biochemical scores²⁴⁾. A study of patients with atrial fibrillation reported enhanced adherence to their medication²⁵⁾. Table 1 presents the characteristics of the included studies.

3.3. Characteristics of interventions

Two studies exclusively used the mobile app^{25,29)}, two included additional phone call support^{22,27)}, and the others incorporated additional regular care^{23,24,26,28)}. Four studies involved the borrowing of a defined device for measurement^{22,23,27,29)}. One study described the relevant theory and intervention techniques related to the intervention²²⁾.

App content was divided into six categories, including others. All studies included self-monitoring²²⁻²⁹⁾. Goal setting was employed in three studies²²⁻²⁴⁾, one of which used phone call support from HCPs²²⁾. Three studies used counseling²²⁻²⁴⁾. Education was provided in five studies^{22-25,28)}, one of which was aided by HCPs²⁸⁾. Feedback was specified in six studies^{22-24,27-29)}, two of which were supported by HCPs^{22,28)}. Others included self-planning and evaluation in two cases^{23,24)}, reminders of oral medications in one²⁵⁾, and a search for the food ingested in one case²⁶⁾. Table 2 presents the characteristics of interventions.

Table 1. Study characteristics

Authors	Year of publication	Study design	Disease	Intervention duration	sample size (n)	Age (year) mean±SD	Sex (female)	Intervention main effects ^a
Kanai, M. et al. ⁽²²⁾	2022	Retrospective observational study	Multiple Lifestyle-Related Diseases : Hypertension, diabetes, dyslipidemia	6 months	IG: 125	IG: 55.3±6.2	IG: 17 (13.6%)	SBP, DBP BW, BMI Salt intake
Kario, K. et al. ⁽²³⁾	2021	RCT	Essential hypertension	24 weeks	IG: 199 CG: 191	IG: 52.4±8.1 CG: 52.0±7.6	IG: 35 (17.6%) CG: 42 (22.0%)	(Results at 12 weeks) 24-h ambulatory SBP (CG<IG) nighttime SBP (CG<IG), morning home SBP (CG<IG), evening home SBP (CG<IG), office SBP (CG<IG)
Sato, M. et al. ⁽²⁴⁾	2023	single-arm trial	Nonalcoholic steatohepatitis	48 weeks	IG: 19	IG: 52.2±10.8	IG: 9 (47.4%)	NAFLD activity score Steatosis score, Ballooning score, Lobular inflammation score, Fibrosis stage (0-4) in patients with stage F2/3 fibrosis ALT, AST, GGT, ALP BW, WC,
Senoo, K. et al. ⁽²⁵⁾	2022	Prospective observational study	Atrial fibrillation	1 month over	IG: 136	IG: 64.2±9.6	IG: 28 (20.6%)	The self-reported 8-item Morisky Medication Adherence Scale (MMAS-8)
Tsunemi, A. et al. ⁽²⁶⁾	2021	single-arm pilot trial	Diabetes	3 months	IG: 18	IG: 53.4±7.8	IG: 7 (38.9%)	HbA1c, Glycated albumin BW, BMI
Sato, M. et al. ⁽²⁷⁾	2022	single-arm trial	Diabetes	6 months	IG: 10	IG: 67.8±3.8	IG: 4 (40.0%)	HDL-Cho
Tomonaga, O. et al. ⁽²⁸⁾	2021	Retrospective observational study	Diabetes	3 months over	IG: 74	IG: 53.9±8.4	IG: 9 (12.2%)	HbA1c BW
Waki, K. et al. ⁽²⁹⁾	2014	RCT	Diabetes	3 months	IG: 27 CG: 27	IG: 57.1±10.2 CG: 57.4±9.4	IG: 7 (25.9%) CG: 6 (22.2%)	HbA1c (CG<IG) Fasting blood sugar (CG<IG)

RCT, randomized controlled trial; IG, intervention group; CG, control group; SBP, systolic blood pressure; DBP, diastolic blood pressure; BW, body weight; BMI, body mass index; ALT, serum alanine aminotransferase; AST, serum aspartate aminotransferase; GGT, serum gamma-glutamyl transferase; ALP, serum alkaline phosphatase; WC, waist circumference; HbA1c, hemoglobin A1c; HDL-Cho, high-density lipoprotein-cholesterol.

^a Results show only those that were effective.

Table 2. Intervention characteristics

Authors	Methods of intervention	Other device	Theory used	Technique used	App content					
					Self-monitoring	Goal setting	Counseling	Education	Feedback (includes advice)	Others
Kanai, M. et al. ²²⁾	app +phone call support by HCPs	•Wearable device (Step, pulse rate, sleep status) •Salt-measurement device	✓	✓	✓	✓ ^a	✓	✓	✓ ^a	
Kario, K. et al. ²³⁾	app + regular care	•Home blood pressure monitor			✓	✓	✓	✓	✓	✓ ^b
Sato, M. et al. ²⁴⁾	app +regular care	None			✓	✓	✓	✓	✓	✓ ^b
Senoo, K. et al. ²⁵⁾	app	None			✓			✓		✓ ^c
Tsunemi A. et al. ²⁶⁾	app +regular care	None			✓					✓ ^d
Sato, M. et al. ²⁷⁾	app +phone call support by a dietitian and physical therapist	•Home blood pressure monitor •Body composition monitor			✓				✓	
Tomonaga, O. et al. ²⁸⁾	app +regular care	None			✓			✓ ^a	✓ ^a	
Waki, K. et al. ²⁹⁾	app	•Glucometer •BP monitor •Pedometer •Weight scale			✓				✓	

HCPs, Healthcare professionals.

^aSupport by healthcare professionals.^bSelf-planning and evaluation.^cReminder.^dFood search.

4. Discussion

4.1. Principal findings

This review is the first to summarize mobile app-based interventions implemented for patients with NCDs in Japan. Of all studies, only one was published before 2021, which suggests that mobile app-based interventions have become more widespread in recent years. While mobile apps continue to expand during covid-19³⁰⁾, mobile app-based interventions are expected to increase in number and importance. Regarding the study design, only two RCTs were conducted^{23,29)}. Most studies were single-arm trials^{24,26,27)} or observational studies^{22,25,28)}, and therefore, further validation using RCTs is required. Concerning study outcomes, only one study used a self-report measurement for medication adherence²⁵⁾, while others measured patients' clinical parameters^{22-24,26-29)}. Most studies have shown valid results with interventions. Of the eight studies, half were conducted in patients with diabetes²⁶⁻²⁹⁾, and all but one showed an improvement in HbA1c levels^{26,28,29)}. Blood pressure, body weight, and salt intake have improved in patients with lifestyle-related diseases²²⁾. Systolic blood pressure has improved in patients with essential hypertension²³⁾ and NAFLD activity score in patients with nonalcoholic steatohepatitis²⁴⁾. These findings suggest that the app-based intervention was an effective parameter in characterizing the diseases. However, only two studies used the app^{25,29)}, whereas the others included regular care or phone call support from HCPs^{22-24,26-28)}. Therefore, concluding that app-based interventions solely led to improved outcomes is difficult. In the future, accumulating effects from studies exclusively using apps is required.

The app content was organized into six categories. All included studies used self-monitoring²²⁻²⁹⁾. Self-monitoring is a common behavior change technique³¹⁾ and is used in all the literature included in a similar review³²⁾. Therefore, it is useful and easy to use for patients with NCDs. Goal setting, counseling, education, and feedback are conventional and helpful methods frequently used in previous studies^{33,34)}. Other content included a self-planning and evaluation function for proactive implementation by the patient^{23,24)}, a reminder function effective for medication management²⁵⁾, and a search function showing the composition of ingested food²⁶⁾. These functions are very beneficial according to the disease characteristics, and the reported apps included the above-mentioned features. However, only one study clearly indicated the use of a transtheoretical model to assess stages of behavior change in patients and the use of behavior change techniques such as motivational interviewing when developing intervention programs²²⁾. These theories have been used in approximately 40% of the reviews of mobile apps for similar diseases published to date^{35,36)}. Since the use of theories related to behavior change is effective³⁷⁾, the utilization of theories should also be considered in the construction of more effective interventions in Japan.

4.2. Limitations

This study has several limitations. First, not all studies were included due to the limited available databases. Second, a scoping review aims to comprehensively map the existing evidence and summarize the findings. Because a scoping review is carried out when a systematic review is not available or a comprehensive review has not been conducted, no risk-of-bias assessment or meta-analysis is performed, and the quality of the included studies cannot be assessed. Finally, to provide a comprehensive review of interventions for patients with NCDs in Japan, this study added searches not only in PubMed and Scopus, but also in Ichushi-Web. Therefore, further review is required once there has been published more English-language literature on studies involving patients with NCDs in Japan.

4.3. Conclusions

This scoping review provides the first overview of mobile app-based interventions for patients with noncommunicable diseases in Japan. The outcome set depends on the disease of the target patients, but interventions improve patients' clinical parameters or medication adherence. The app content included self-monitoring, goal setting, counseling, education, feedback, and others. However, the theory has not been used to design interventions in most studies. The development of theory-based interventions is required in the future.

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Ethics approval: None.

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REVIEW ARTICLE

Reviewing Literature Regarding Overseas Art Workshops for People with Disabilities to Explore Their Satisfaction with Them

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ABSTRACT

This study aimed to analyze and summarize the research trends on the satisfaction given to people with disabilities by art activities/workshops abroad. The research seeks to compare the results and focus of Japanese and foreign literature in order to improve the artistic activities for people with disabilities in Japan.

This study used a systematic review (SR) of relevant foreign literature to find out how the sessions in other countries proceeded and what changes were obtained. In Japan, various art activities for the disabled have been reported to be effective. However, only qualitative studies have been conducted to evaluate them. On the other hand, many mixed studies have been conducted in other countries, which has facilitated a better statistical understanding of the changes that people with disabilities have experienced through such artistic activities.

Two main categories of satisfaction—personal satisfaction and social satisfaction—were identified through the analysis. There was a strong tendency to view mental satisfaction as an effect in many papers; for example, the effect on the mental well-being of the subject, the establishment of identity, and the enrichment of emotions. However, no particular attention was paid to returning to daily life or cultivating artistic creativity among the people with disabilities.

Keywords: Well-Being, people with disabilities, satisfaction, art workshops, literature review

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1. Introduction

In Japan, art activities for people with disabilities are becoming popular tool for building a symbiotic society, and there are many practices in the fields of art, music, drama, and dance. The Ministry of Health, Labour and Welfare and the Agency for Cultural Affairs have expanded their support programs for the arts and cultural activities for people with disabilities, and 35 centers that the support of such activities for disabled people have been established nationwide. In particular, a survey of facilities for people with disabilities in Osaka and Iwate prefectures found that almost 70% of these facilities offer art workshops, which indicates that art activities are conducted on a daily basis at these facilities¹⁾. Also, the discovery of artists with disabilities and the commercialization of their artworks have been carried out with the support of the Japanese government.

It has been reported that the performance of artistic activities by people with disabilities significantly aids the improvement of their well-being and promotes their self-approval and satisfaction²⁾. It is said that artistic activities enable people with disabilities to express themselves in a novel manner, communicate non-verbally, and achieve self-acceptance and acceptance from others³⁾.

In recent years, many fields have focused on the satisfaction gained from artistic activities. For example, in the field of interpersonal support, it has been stated that leisure time cultural activities (including artistic activities) not only significantly impact the quality of life of people with disabilities, but also promote their social participation, reduce discrimination against them, and safeguard their human rights⁴⁾. In the field of nursing care, it was also reported that the creation of Japanese flower arrangements (ikebana) and relaxation exercises improved the well-being of disabled people who use day-care centers⁵⁾. In addition, it was reported that in psychiatric hospitals, musical activity programs that are not art therapy have become a source of enjoyment for people with mental disorders, and are used to improve their lives, treatment, rehabilitation, and discharge support. It has also been reported that its applications are expanding. For example, it is used to improve people's understanding of people with disabilities⁶⁾.

However, mostly qualitative research has been conducted on this topic. The resultant data of such research include interviews, videos, activity records and newspaper articles, which are easily influenced by the subjectivity of the researchers. In addition, it is difficult to effectively grasp the current situation of people with disabilities using psychological scales and domestic papers generally only qualitatively evaluate the satisfaction of participants. In the future, it is expected that research results will be presented with evaluation tools that cover multiple angles, such as a combination of psychological scales and statistical analysis. In the midst of such accumulated research, this study focused on the types of workshops/sessions and their impact, summarizing the research results and methods of overseas papers.

Outside of Japan, mixed research methods are often used. Quantitative and qualitative analyses are conducted simultaneously—analyzing scores on psychological scales while strengthening evidence with qualitative data. Vogelpoel⁷⁾ and Jarrold⁸⁾ adopted a mixed research approach to explore the satisfaction of people with disabilities who participated in arts activities. While the majority of participants were dissatisfied with their quality of life and personal well-being at the beginning of the program, most participants reported increased self-confidence, communication skills, self-esteem, and mental health scores after the program. The study used (1) semi-structured interviews, (2) cumulative qualitative analysis tools, (3) observation scales, and (4) case studies to capture the changes that the subjects underwent from multiple perspectives. Another study on the effects of arts activities on mentally disabled people in a Chinese institution for people with disabilities also used a stratified randomized controlled trial while qualitatively analyzing observation sheets of users'

daily lives. The study revealed that the participants' sense of well-being increased significantly over the course of the experimental project⁹⁾.

The World Health Organization (WHO) defines health as a state of complete physical, mental, and social "well-being," with or without illness or infirmity. Many scales have been used simultaneously in foreign studies. The Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), the Patient Health Questionnaire (PHQ-9), Generalized Anxiety Disorder -7 (GAD-7), and the Social Introversion Scale (SI) are often used in assessing the psychological state of session participants, as they capture participants' mental, physical, and social well-being. We also observed that the overseas studies displayed a tendency to analyze their results in line with the concept of health as defined by the WHO.

Examining the above studies revealed that mixed research was often used and that qualitative analysis was utilized to comprehensively grasp the daily changes that each disabled person experienced, while psychological scales were used to capture the changes in their mood. In any case, through artistic activities, people with disabilities increased their sense of satisfaction, self-affirmation, happiness, and self-confidence. Additionally, such activities promoted their social participation and reduced their social isolation.

It is thus significant for Japan to grasp the direction and results of foreign studies in order to consider how to promote support for people with disabilities through art in the future, which will be led by the development of cultural activity support programs for people with disabilities.

2. Objective

In order to improve the artistic activities for people with disabilities in Japan, it is necessary to examine and compare the literature from Japan and other countries. Thus, this study aimed to analyze and summarize the research trends on the satisfaction given to people with disabilities (hereinafter referred to as "participants") by art activities/workshops abroad.

3. Method

As a research method, this study used the systematic review (SR) (A systematic review is defined as "a review of the evidence on a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant primary research, and to extract and analyze data from the studies that are included in the review." The methods used must be reproducible and transparent. (Undertaking Systematic Reviews of Research on Effectiveness. CRD's Guidance for those Carrying Out or Commissioning Reviews. CRD Report Number 4 (2nd Edition). NHS Centre for Reviews and Dissemination, University of York. March 2001.) method proposed by the Joanna Briggs Institute (JBI) in the U.K., which is engaged in the development and dissemination of SR in the field of nursing, and revised by the Japanese Nursing Association¹⁰⁾. In addition, the selected articles included both qualitative and mixed studies. The JBI's qualitative review method and its critique evaluation sheet were used for evaluation. The categories were extracted using the grounded theory approach. For this purpose, qualitative and quantitative critiques were conducted in this study. The review of this study proceeded in the following five steps.

The rationale for our selection of the Joanna Briggs Institute (JBI) assessment tools is as follows: Systematic Reviews (SR) undertaken using JBI tools are required to comply with strict procedures as set out by the reviewers. These include formulating a review objective and question, defining inclusion and exclusion criteria, executing a comprehensive literature search, selecting studies for critical appraisal, evaluating the quality of the chosen studies using one or more standardized

tools, extracting data following a template, analyzing, synthesizing, and summarizing data, and eventually, writing up findings and reaching conclusions. In certain cases, these may also involve making recommendations for practice, policy, or research¹¹⁾.

The JBI methodology incorporates distinct evaluation approaches for both qualitative and quantitative research, referred to as the JBI Levels. These levels connect the ranking of evidence of effectiveness generally to the study design and the capacity to maximize internal validity. For instance, a randomized controlled trial (RCT) is ranked higher than a cohort or case-control study, and a systematic review of RCTs is ranked above a single RCT. Evidence hierarchies have been established as a tool to support reviewers in ranking evidence, enabling the determination of the relative strength of results procured from the studies included in the review, and thus facilitating the creation of robust and reliable conclusions¹¹⁾.

However, while PRISMA presents detailed guidelines, it appears that JBI allows for a more systematic analysis of the target literature when it comes to re-evaluation such as level evaluation of qualitative and quantitative studies. Hence, we have intentionally chosen to employ JBI in this paper.

3.1. Decide on the research question to be addressed

This study aimed to analyze and summarize the research trends on the satisfaction that art workshops give to participants overseas.

First, the research theme was positioned using the following table1 that adopted the PICO cycle for qualitative research, which is used to concretize and capture the theme formulated in systematic reviews¹⁰⁾.

Table 1. PICo Cycle Diagram

	Meaning	Main points of this research
P	Population	Persons with disabilities (disabled)
		Adults over 18 years old
I	Phenomena of Interest	Type of workshop/ session
		Satisfaction and changes resulting from it
Co	Context	In addition, we excluded sessions in which participants viewed a predetermined work of art, and include papers in which session participants participated and engaged in creative activities on their own.
		Period: Twenty years from 2000 to 2020
		Region: Full-text papers written in English in countries other than Japan

3.2. Inclusion and exclusion criteria

The review protocol eligibility criteria for this study was developed with reference to the “Minds Clinical Practice Guidelines, Chapter 4: Systematic Review 2020.”

Since the target of this study was foreign literature, the research team decided to limit the databases to PubMed, Google Scholar, Scopus, and Oxford Handbook Online. First-hand research was conducted twice by the first author. Followingly, literature was added based on the opinions of the second author (art management expert) and the third author (dance expert). All the articles in this study were open access, and grey literature was not used.

The articles were screened over two rounds. Their keywords and abstracts were examined in the first round, whereas their content was examined in the second round. The extracted literature included qualitative studies, case studies, and mixed studies, and qualitative extraction was used. For each critique, the JBI's recommended critique index was used. In this paper, there are a list of references, a table of critique results, and the JBI recommended evidence (table2).

Table 2. Details of Literature Use

Item	Contents
The database	PubMed, Google Scholar, Scopus, Oxford Handbook Online
Hand searching	Done: Google Scholar Search and Expert Advice
Grey Literature	
Screening	Primary screening: screening by content of article abstract Secondary screening: screening by content of article
Data extraction method	
Classification of research designs	Qualitative research, randomized controlled trials, case studies
Effectiveness index	Qualitative assessment and discussion, psychological scales
Indicators to evaluate individual studies	JBI method

3.3. Identification and collection of studies

Figure 1 illustrates the flowchart of the adoption process. A total of 2024 papers were collected from the electronic database, and 25 papers were selected on citations of related papers and expert advice. After two rounds of screening in accordance with the duplication and conformity criteria, 2011 papers were excluded as they did not meet the conformity criteria. As a result, 12 papers were selected as relevant papers (Table 3-1~3-4).

In accordance with the protocol, this study aimed to examine art activities/workshops that did not fall under the umbrella of “art therapy.” In addition, sessions in which participants viewed predetermined artworks were excluded, and papers in which session participants engaged in their own creative activities were included. The analysis was conducted on full-text articles written in English that examined adults with disabilities in countries other than Japan over a 20-year period (2000 to 2020). Articles, books, and reports other than full-text articles were excluded from the current study. The analysis was conducted by three researchers with expertise in the fields of disability welfare, the arts, and statistical analysis. A list of characteristics of the included studies was also made (Figure 1).

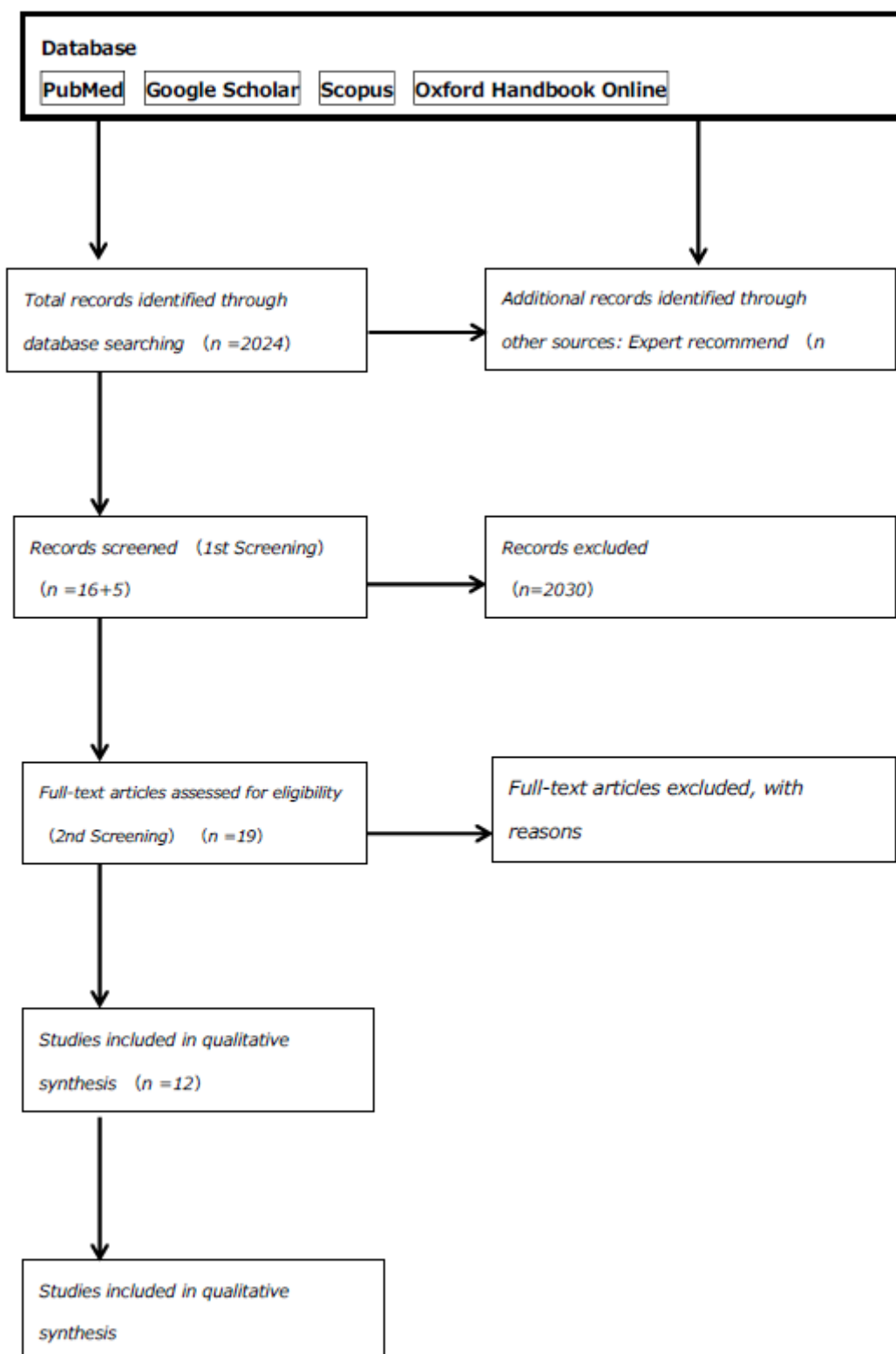


Figure 1. Literature Flowchart

Table3-1. Characteristics of Included Studies - Randomized Controlled Trial Form

Study	Country	Setting/Context	Participant characteristics	Groups	Outcomes measured	Description of main results
Rainbow T. H. Ho CKPC. 2020.	Hong Kong	The EABI group received 10 weekly 90-min sessions, with a total of 15 contact hours. Each intervention group contained 6–8 participants and was facilitated by a registered expressive arts therapist or expressive arts therapy trainee.	This study assigned 109 Chinese adults with intellectual disabilities into EABI (N = 55) or control groups (N = 54) using stratified randomization.	55(1)54©	The interview findings suggest that the EABI group was more emotionally expressive and stable after the intervention. Compared to the control group, the EABI group tended to use more diverse colors and leave less empty space in their drawings. No significant overall improvements were found in the EABI group with respect to aberrant behaviors, mood or personal well-being. Among males, the EABI participants showed significantly more anger and less energetic moods than those in the control group. Among females, the EABI participants showed significantly lower levels of aberrant behavior than those in the control group.	The results of this study suggest that expressive arts-based interventions have different effects on the emotional and behavioral well-being of male and female participants. Moreover, increased color usage may imply a more positive state of emotional well-being.

Table3-2. Characteristics of Included Studies - Interpretive and Critical Research From

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/Context/Culture	Participant characteristics and sample size	Description of main results
Wilson GBM. 2019	thematic analysis	Italia, Ireland, U. K	What social needs associated with having learning impairments can interactive music workshops address? •How do adults with such impairments experience interactive music workshops? •What impacts on social needs do they and those around them perceive from taking part in music? •What features of the music workshops might be effective, and why?	Twenty music workshops for 37 individuals recruited via resource centers in an accessible rural area •Interviews with music staff, resource center users, their families and staff •Observation of workshops with co-researcher from service user group •Focus group with stakeholders	Thirty-seven adult service users (12 female, 25 male) were recruited via four separate centers located around Renfrewshire (a local authority in central Scotland) to take part in workshop groups on either Mondays or Fridays. Their learning difficulties ranged from mild to profound, and their levels of independence ranged from requiring constant one-to-one care to living alone in sheltered accommodation.	Taking Part in the Music Workshops: Over the 10 weeks, all groups strengthened their abilities to keep time and concentrate together, to coordinate musical exercises, and to take turns effectively. 2.Impacts of Musical Participation on Participants: Participants acquired an enthusiasm to engage in music and were able to build identity around a renewed sense of themselves as musical and accomplished.
Wilson CS. 2017.	Quantitative methods:TAG,WEMWBS,CQS Qualitative methods:interview	U. K	The aim of the study was to conduct a mixed-methods evaluation of a participatory arts programme for young people with, or at risk of, mental ill health.	The qualitative strand consisted of semi-structured interviews and focus groups with ArtZone participants at the end of their course.	122 course participants completed pre/post measures of mental illness severity and wellbeing, and 34 participants took part in interviews and focus groups.	Quantitative :1. Regarding TAG: The mean TAG score at baseline was 4.90 (SD=4.10), which significantly decreased to 4.57 (SD=3.77) after the intervention. 2. Mental Health: The mean WEMWBS score increased significantly from 15.37 (SD=6.56) at baseline to 20.47 (SD=5.75) after the intervention: z=8.229, p<.001. 3. Satisfaction: 113 participants completed the CSQ after the course. The mean score was 29.46 (SD=3.13), indicating that the participants were very satisfied with the course. Qualitative: 1.A number of focus group and interview participants reported enjoyment of the arts activities; described how they provided a distraction and a sense of escapism; and helped to normalise their situations. 2.Nearly all interview and focus group participants said that they learnt new relaxation and self-soothing techniques as a result of being on the programme. 3. Empowerment and increased confidence 4. Increased motivation 5. Changes at a social level:Participants reported a considerable impact of the arts programme on social 6.interactions and relationships between the patients themselves, between patients and staff, and between patients and the artists facilitating the groups. 7.Most participants reported that they made new friendships and established contextspecific support networks with other participants. 8. Relationships between medical staff and patients Improved relationships between artists and patients
Emma Gentle PO. 2020.	A single iterative case-study design was employed using participatory action research (PAR) methodology	Australia	How does semi-directed facilitation of an art group impact connection for its neurodivergent participants? Can the art space contribute to authentic inclusion that increases belonging?	Methods included: three participants think aloud (T/A) groups, nine researcher observations, and nine third-party interviews. The data were thematically analyzed then triangulated using three different sources.	The study included nine participants with intellectual disability and one with an acquired brain injury who regularly attend art-making workshops, along with eight of their chosen arts advocates.	There was an increase in participants' quality of life. Art processes created a deeper sense of self, along with an interconnectedness within the art group. It reached beyond the studio through the community's interaction with the artworks, and the artists, indicating creativity as a path to enriched connection.

Mohatt N HB. 2015.	This study is part of a longitudinal, community-based participatory research (CBPR) project that examines the impact of participatory public art on adults and youth enrolled in behavioral health services and on the distressed city neighborhoods in which they live and participate in services.	U. K	The objective of this study is to identify individual mechanisms of change that result from engaging in an innovative participatory public art project for persons with significant behavioral health challenges.	The intervention consisted of teams of artists who worked at identified partner agencies for approximately 9 months to paint and install a large mural in a public space.	264 adults participated in the intervention and evaluation, with 71 % of the total sample identifying as African American and 94 % as a person of color.	(1) friendship, (2) sense of self, (3) giving back, and (4) hope. The two cases indicate that the development of a strengths-based sense of self through art was accompanied by a growth in personal social responsibility. The two cases also indicate that participatory public art may have a profound impact on the internalization of stigma. The findings support the value of participatory public art as a strategy for blending recovery and public health perspectives to promote both individual and community wellness.
Lawson J RF. 2014.	interviews were analysed using interpretative phenomenological analysis.	U. K	To explore the psychosocial benefits of participating	Single semi-structured interviews were conducted by the first author with each research participant, lasting up to 60 minutes.	Single semi-structured interviews were conducted by the first author with each research participant, lasting up to 60 minutes.	Participants were able to build their confidence and recognise their own worth. This phenomenological study confirmed that for people living with mental health problems, lengthy immersion in art-making, acquisition of artistic skills and knowledge, and a socially inclusive group context all help to construct an identity that is less stigmatised and less defined by 'mental illness' labels.
Vogelpoel NJ. 2014.	The research took a mixed-methodological approach, conducting and analysing data from interviews and dynamic observation proformas with facilitators and quantitative psychological wellbeing scores with participants throughout the course of the programme. Observations and case study data were also collected to complement and contextualise the data sets.	U. K	he purposes of this paper is to describe the benefits of a social prescribing service for older people with sensory impairments experiencing social isolation. The paper draws on the findings from a 12-week programme run by Sense, a voluntary sector organisation, and illustrates how integrated services, combining arts-based participation and voluntary sector support, can create positive health and wellbeing outcomes for older people.	The research, taking a mixed method approach, combined the Warwick and Edinburgh Mental Wellbeing Scale (WEMWBS); a self-reporting measure completed at the first and last session; with accumulative qualitative analysis tools and memberchecking methods such as an observation scale, case study approach and interviews with staff	Local participating GPs referred or "prescribed" 12 participants to the programme; nine females and three males ranging in age from 61 to 95 years, with an average age of over 80, all of whom had been identified as sensory impaired and socially isolated.	Data analysis highlighted common outcomes for the majority of the 12 participants involved in the programme. At the start of their involvement, dissatisfaction was widespread amongst the participants in relation to their perceived quality of life and personal wellbeing. Most participants highlighted the barriers they were facing in relation to access, inclusion, inter-personal relationships, physical and psychological wellbeing and autonomy, as well as receiving support for their dual-sensory impairment. At the end of the 12-week programme the findings highlighted that significant social and health-related gains had been made by the participants.
Van De Venter EB. 2015.	A mixed methods approach	U. K	The aim was to assess mean change in Warwick Edinburgh Mental Well-being Scale (WEMWBS) scores following participation in AoR and then qualitatively explore associations found between individual and contextual factors with differential changes in well-being.	People with mild-to-moderate mental health problems were referred to one of four artist-facilitated groups, held in inner-city GP practices or community centers. All participants were exposed to a range of activities over the 20-week intervention period including, but not exclusively, painting, textiles, music, photography and film. One group was provided for mothers with infants; the other groups were open to all. The scheme aimed to improve participants' well-being and social capital through collective engagement in creative arts, increased social contact and community engagement. Further details of the scheme can be found in a previous report.	44 volunteers	Mean well-being scores improved by 8.0 (95% CI 4.8-11.3, $P < 0.0001$); the number of sessions attended and baseline scores were positively associated with outcome score. Participants from Black and Minority Ethnic (BME) groups and females appeared to show greater improvement in well-being scores than White British or male participants. Qualitative interviews supported and further explained these findings and suggested differential impacts of AoR may, in part, be explained by the importance of sharing experiences, reduced social isolation and external stressors.
Van Lith TF. 2011.	This research used qualitative in-depth interviews to explore the role of art making in the mental health recovery journey. The sample comprised 18 consumer participants who attended art-based programs in two psychosocial services in Victoria, Australia. The 60–90 min interviews were analyzed using interpretative phenomenological analysis.	Australia	The current study inquiries into mental health consumers' lived experiences of art making within psychosocial rehabilitation services and their views on how art making supports mental health recovery.	This study was conducted in collaboration with Prahran Mission and Mind Australia, two of the largest psychosocial rehabilitation services in Victoria, Australia. In both services, a broad spectrum of arts-based practices is currently provided with a strong leaning towards the visual arts as the main modality. This includes activities such as painting, drawing, sculpture, ceramics, and textiles.	The sample comprised 18 volunteer mental health consumers who were actively engaged in an art making program (6 males and 12 females)	Feelings of belonging, security and encouragement are provided by the setting. The facilitator guides yet provides freedom and support to assist in expanding one's potential. The group creates a sense of connectedness by providing acceptance, encouragement and socialization. Absorption in the creative process enables a sense of wholeness and perspective. Releasing tensions through the art making process leads to a sense of becoming empowered. Experiencing challenges and rewards in art making creates a will to achieve and keep developing. The image gives insights about emotions, feelings and wellness. Communicating and reflecting on intimate and personal meanings gives a sense of validation. Gaining motivation, encouragement and a connection with others.

SUSAN POTTER. 2015.	This mixed methods investigation contained participant elements across two time periods, using a combination of quantitative and qualitative methods. For the quantitative strand, participants were asked to complete scales measuring aspects of wellbeing, anxiety, depression and social inclusion before starting their 12-week workshop programme (T1) and again at the end of the 12 weeks (T2). In the qualitative strand, semi-structured interviews were held with a sample of participants, again at the beginning and end of the workshop programme, to explore their expectations and experiences of Arts on Prescription. Interviews were audio-recorded and transcribed for analysis.	U. K	re there changes in participants' self-reported levels of anxiety, depression, social inclusion and wellbeing across the duration of the programme? If so, do individual participants experience similar and/or comparable changes? To what factors do individual participants attribute such changes? How might this learning inform further development of the Arts on Prescription programme and research in the field more broadly?	Arts on Prescription comprises a 12-week arts programme, delivered by one professional artist, supported by one mental health counsellor. Each weekly workshop lasts two hours and includes a range of visual arts activities (e.g. drawing, collage, stitching, clay and wire work).	The participants (N = 45) comprised 16 males and 29 females, ranging in age between 18 and 74 years. The minority (n = 10) of participants were in employment or retired, while the majority (n = 35) had been out of paid employment for several years due to disability and/or mental health issues, including anxiety, depression, bipolar disorder, eating disorders and psychosis.	1. the majority of participants rated their experience of Arts on Prescription highly. 43 (95.5%) participants reported that they had enjoyed the program and would recommend the program to a friend. 35 (77.7%) reported a development in their art skills, through taking part in Arts on Prescription. 29 (64.4%) reported an increase in confidence, while 32 (71.1%) reported an increase in motivation. Finally, 31 (69%) reported feeling more positive about themselves after taking part in the Arts on Prescription program. Importantly, of those individuals who attributed positive outcomes to the program, there were once again close parallels noted in those who reported decreased anxiety and depression and increased social inclusion and wellbeing. Similarly, for the minority of individuals who rated the program negatively, there were parallels noted between a self-reported increase in anxiety and depression with a decrease in social inclusion and wellbeing. 2. Effect: Rebuilding identity: Self-acceptance Autonomy Making connections: Positive relations with others Environmental mastery Expanding horizons: Environmental mastery personal growth A sense of purpose: Purpose in life Personal growth The need to create: Personal growth Autonomy
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Table3-3. Characteristics of Included Studies - Text and Opinion Study Form

Study	Type of text	Population represented	Topic of interest	Topic of interest	Stated allegiance/position	Description of main argument(s)
Gillam T. 2018.	text and opinion	Mental Health services user	my focus has been on the wellbeing of the providers and users of mental health services, implicit in all of this is an assumption that the mental health and wellbeing of the wider community can be enhanced through creative activity. This paper seeks to explore this aspect further. My particular interest is in music and creative writing but what I discuss can apply just as much to any creative arts activity.	The approach taken is to draw selectively on research in the field of creativity, creative arts and wellbeing, focusing in particular on the use of music and creative writing, and to incorporate learning from clinical experience to explore what is understood about the health and wellbeing benefits of creative arts activity.	The purpose of this paper is to explore how participation in creative arts activity can enhance public mental health and wellbeing.	There is evidence that creative arts activity is beneficial to mental health and wellbeing. Arts activities that involve active participation appear to offer the greatest benefits. Creative arts participation can help people with diagnosed mental health difficulties to recover from mental illness. Moreover, creative arts activities can also promote wellbeing in the general population.

Table3-4. Characteristics of Included Studies - Systematic Review and Research Syntheses Form

Study	Review objectives	Descriptions of interventions/phenomena of interest	Descriptions of outcomes included in the review	Descriptions of contexts included in the review	Search details	Number of studies and participants included	Appraisal instruments used	Description of main results
Steven Baginski - Gustav Kuhn. 2019.	Changes in Well-Being through magic	3.1 Witnessing magic: deeper appreciation 3.2 Discovering magic secrets: motor and social skills 3.3 Performing magic: happiness 3.4 Teaching with magic: curiosity	Magic is an ancient entertainment form, and in the last decade we have witnessed growing scientific interest in understanding the experience of magic (Leddington, 2016; Lamont, 2017; Rensink & Kuhn, 2015a), as well as cognitive mechanisms that enable magicians to create these unique experiences (Kuhn, Caffaratti, Teszka, Rensink, 2014). The science of magic has started to build bridges between the scientific community and magicians applied psychological knowledge and experience. As seen in this review, magic has also been used to enhance wellbeing in physical, affective, cognitive, and social domains throughout both active programs and emerging empirical studies.	A common application for these programs is physical therapy, but other settings include schools, hospitals, psychological therapy, and lifestyle intervention. Empirical studies show positive effects, but many have weak methodologies, warranting further research.	non	19	non	We have observed that witnessing magic enhances affective and cognitive wellbeing by inspiring intense curiosity and interest, which have been used as a distraction therapy. Similarly, discovering secrets of magic was linked to wellbeing, as pleasant emotions from insight experiences. Performing magic builds upon these effects by showcasing improvements in social and motor skills, while retaining at least some aspects from prior stages. Using magic to teach might cultivate a deep sense of meaning and appreciation for one's teaching contributions. During each of these stages, there appears to be a sense of wellbeing, motivating progress toward the next stage.

3.4. Analysis—Level of evidence level

In this study, the 12 selected studies were analyzed to determine if they were eligible. For this step, a critique was conducted using the JBI's statistical software, called System for the Unified Management, Assessment and Review of Information (SUMARI). The level of evidence for qualitative research was indicated (descending order: I (high)~IV(very low)). A total of nine references were evaluated for the level of evidence of qualitative research, and for other reports, only the results of the critiques were shown. The recommended levels were also attached.

The level (Dependability) of evidence for qualitative research in this study was based on the ConQual approach recommended by the JBI. (ConQual helps users of qualitative systematic reviews to establish the credibility of the evidence generated by these types of reviews, making it a practical tool to support decision making.) Specifically, all eligible papers were critiqued using SUMARI. Next, we focused on the qualitative critique questionnaire of each study. Questions 2 to 4 and 6 to 7 of the questionnaires were items that queried the reliability of the paper. With 4–5 'yes' responses, the paper remained unchanged; with 2–3 'yes' responses, it was moved down 1 level; with 0–1 'yes' responses, it was moved down 2 levels. (This is measured by asking questions related to the appropriateness of the conduct of the research with research aims and purpose:

Context:

1. Is there congruity between the research methodology and the research question or objectives?
2. Is there congruity between the research methodology and the methods used to collect data?
3. Is there congruity between the research methodology and the representation and analysis of data?
4. Is there a statement locating the researcher culturally or theoretically?
5. Is the influence of the researcher on the research, and vice-versa, addressed?

Evaluation criteria: 4–5 'yes' responses, the paper remained unchanged; 2–3 'yes' responses, moved down 1 level; 0–1 'yes' responses, moved down 2 levels.)

"Credibility" was measured by assigning a level of credibility to the synthesized findings. The JBI recommended level, which includes the credibility score, is also shown in Table 4.

Next, the quantitative research, literature review, and descriptive studies were conducted using the GRAND approach recommended by the JBI, (Developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October 2013) which evaluates based on five aspects: level of evidence for effectiveness, for diagnosis, for prognosis, for economic evaluation, and for meaningful enrichment.

In addition, due to the small sample size of this study, "not applicable" was used for the evaluation items that were not applicable to the medical articles(table5~7).

Table 4. Qualitative Research (n=9)

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Dependability	Credibility	ConQual	JBI Grades of Recommendation
Gentle and O'Brien 2020	Y	Y	Y	Y	Y	U	U	Y	Y	Y	All unequivocal	Downgraded (-1) Level	IV	A
Wilson and MacDonald 2019	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All unequivocal	Downgraded (-1) Level	II	A
Wilson CS. 2017	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All unequivocal	Downgraded (-1) Level	II	A
Mohatt et al. 2015	U	Y	U	N	U	N	N	Y	Y	Y	Downgraded (-2) Level	Downgraded (-3) Level	IV	B
Susan 2015	Y	Y	Y	Y	U	U	U	Y	Y	U	Downgraded (-1) Level	Downgraded (-2) Level	IV	B
Van de Venter and Buller 2015	Y	Y	Y	Y	U	U	U	Y	Y	Y	Downgraded (-1) Level	Downgraded (-2) Level	IV	B
Lawson et al. 2014	U	Y	Y	Y	Y	N	N	Y	Y	U	Downgraded (-1) Level	Downgraded (-2) Level	IV	B
Vogelpoel and Jarrold 2014	Y	Y	Y	Y	Y	U	U	Y	Y	Y	All unequivocal	Downgraded (-1) Level	II	B
Van Lith et al. 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All unequivocal	Downgraded (-1) Level	II	A

Table 5. Randomized Controlled Trial(n=1)

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Evidence Level
Rainbow T. H. Ho CKPC, 2020	N	Y	Y	U	U	U	U	Y	Y	Y	Y	Y	N	Levels of evidence for effectiveness: 1-c Level of evidence for diagnosis: -- Level of evidence for prognosis: 3-b Level of evidence for economic evaluation: 7 Level of evidence for meaningfulness: 1

Table 6. Systematic Review and Research Syntheses (n=1)

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Evidence Level
Gillam 2018	Y	Y	U	Y	Y	N	Levels of evidence for effectiveness: 5-a Level of evidence for diagnosis: -- Level of evidence for prognosis: 5-c Level of evidence for economic evaluation: 7 Level of evidence for meaningfulness: 5

Table 7. Text and Opinion Study (n=1)

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Evidence Level
Bagienski and Kuhn 2019	N	U	U	N/A	N/A	Y	U	N	N/A	U	Y	Levels of evidence for effectiveness: 5-a Level of evidence for diagnosis: -- Level of evidence for prognosis: 5-c Level of evidence for economic evaluation: 7 Level of evidence for meaningfulness: 4

4. Results

4.1. Attributes of the subjects (table 8)

As shown in the table, with regard to the attributes of the subjects, except for the case studies and literature review, the number of papers on people with mental disabilities was 6, that for people with physical disabilities was 3, and that for people with learning disabilities and intellectual disabilities was 2 each (with duplicates).

5)-2. Countries of the target papers

The countries of the target papers are summarized in Table 9. Although there were cases where researchers from more than one country worked on a single paper, researchers and references from the U.K. were the most common. Hong Kong, Italy, and the Republic of Ireland had the fewest number of occurrences (1 each).

Table 8. Disability Category of Participants

Category	Volume
Mental disability	6
Physical disabilities	3
Learning disabilities	2
Intellectual disability	2

Table 9. Countries

Category	Volume
United Kingdom	9
Australia	2
Hong Kong	1
Italy	1
Ireland	1

4.2. Content of the sessions

The content of the sessions conducted in the target literature are summarized in Table 10. The sessions were divided into four broad areas: music, art, physical expression, and crafts. Some of the sessions were more creative in nature, such as painting, collage, clay, and art-making, as opposed to film and music appreciation. The diversity of artistic activities in each program was also noticeable, with multiple artistic activities being offered on a regular basis rather than a single activity.

4.3. Research methods (table 11)

As shown in the table below, qualitative research was more common than quantitative or mixed research in the research approach of the target article. Among them, qualitative research included the matic analysis, participant observation, and interpretive phenomenological analysis. In addition to qualitative studies, mixed studies included quantitative studies such as the Warwick and Edinburgh Mental Well-Being Scale (WEMWBS), the Patient Health Questionnaire (PHQ-9), and randomized controlled trials.

Table 10. Session Details

Session Types	Contents
Music	Music games, playing, skill training
Painting	Painting, spray painting, drawing art in public spaces
Performance using the body	Dance/simple body movements, theater, magic direction
Handicrafts	Art-making, clay, wire work, sculpture, ceramics, weaving
Others	Collage, stitching, photography, textiles, literature, watching movies, stop frame animation, art projects, community art, walking/traveling

Table 11. Analysis Method

Research Approach	Contents
Qualitative research	<ul style="list-style-type: none"> • Subject analysis • Participatory observation • Interpretive phenomenological analysis (IPA)
Mixed research (items other than qualitative research)	<ul style="list-style-type: none"> • Warwick and Edinburgh Mental Wellbeing Scale(WEMWBS) • Patient Health Questionnaire(PHQ-9) • Generalized Anxiety Disorder -7(GAD-7) • Social Introversion Scale(SI) • Client satisfaction questionnaire • Randomized controlled trials
Case Study	<ul style="list-style-type: none"> • Case comparisons
Literature Review	<ul style="list-style-type: none"> • Review similar to SR

4.4. Research questions in the target literature:

Since there are no existing categories or definitions for the research questions in the target literature, we used the grounded theory approach to categorize them (which seems to be highly valid since it extracts and uses keywords that are characteristic and representative of the articles). In addition, if a single research paper consisted of many components, we divided them into different categories. For example, a session of artistic activities for people with disabilities spanned multiple genres, and the results were diverse. Also, the analyzed papers sometimes contain multiple research questions. For this reason, in this study, we assigned a category for each research question.

As shown in Table 12, a significant portion of the reviewed literature focused on enhancing the well-being of people with disabilities. The most commonly used terms in these papers were well-being, happiness, and satisfaction—the improvement of which were demonstrated using psychological scales and semi-structured interviews. Improvements in social life were explained through various aspects such as interactive experiences, social and community participation, the sense of community affiliation, and the psychosocial effects of art projects. Common changes were defined as the common aspects of the changes that the participants demonstrated throughout the experimental program of the study, and further development was defined as how these artistic activity sessions for people with disabilities can be expanded in the future and how they can contribute to society.

Table 12. Category

Category	Definition and interpretation
Effects on Happiness	Increased emotional well-being, decreased abnormal activity 4); positive well-being outcomes 5); happiness, curiosity 1); increased WEMWBS 8); mental health recovery 9); well-being recovery 12).
Improvement in social life	Interactive experiences, effective features for people 12); sense of belonging 2) ; psychosocial effects 5)
Mechanism of change	Personal change and its content through art projects 6)
Common change experiences	Common “collaborative” experiences of participants throughout the program 2)
Further development	Contributing to inclusion 2); taking up the arts program and spreading it widely 7)
Creative activities	Activities carried out by creative acts from participants such as music, literature, magic, accessories, painting, etc. (all references)

4.5. Exploring satisfaction

This study aimed to thoroughly explore the satisfaction that people with disabilities derived from their participation in art workshops/activities. For this purpose, the results of each of the survey papers were analyzed using the categorization method of the grounded theory approach (table 13).

Table 13. Semantic Classification of Well-Being

Personal Satisfaction		Social Satisfaction	
Return to daily life	Mental well-being	Promote communication and social participation	Draw out artistic creativity
Freedom and support	Emotion wellness	Expressivity	Creativity
Life of balance and wellness	Self-regulation	Interpersonal relationships	The need to create
Be motivated	Gratification	Belonging, security	
Reduced social isolation	Stress reduction	Sense of connectedness	
Daily Value	Deepened understanding	Establishing new friendships	
Expanding horizons	Imaging	Communication	
	Relationship	Making connections	
	Increased self-confidence	Restrictions on the location of the event	
	Mental wellbeing	Connection	
	Self-value	Getting out of one's shell	
	Sense of accomplishment	Breaking social isolation	
	Identity		
	Self-acceptance		
	A sense of purpose		
	Normalizing emotions		
	Therapy		

The results of the analysis were mainly divided into two main categories: personal satisfaction and social satisfaction. Furthermore, “personal satisfaction” was divided into “mental well-being” and “returning to daily life,” whereas “social satisfaction” was divided into “promoting communication and social participation” and “cultivating artistic creativity.” The results revealed that there was a strong tendency to view mental satisfaction as an effect. For example, mental well-being, identity, and emotion wellness were mentioned. However, no particular attention was paid to returning to daily life or cultivating artistic creativity.

5. Discussion

5.1. Sessions

As summarized in Table 10, the most commonly used projects were art activities that simultaneously incorporated a variety of art activities. Van Lith et al⁹⁾ conducted art-making workshops, which involved painting, drawing, sculpture, ceramics, and weaving, for 18 participants with mental disabilities. The activities were diverse and individual art was displayed in regular art exhibitions. A participatory arts program—a project that included activities such as walks, trips, and art-making—was also organized for 12 elderly participants with sensory disabilities¹²⁾. The project included not only art-making, but also handshake sessions and discussions to promote the participants’ social participation and communication. Lawson et al¹³⁾ also analyzed mentally disabled people who participated in art projects for more than two and a half years. Other studies that also conducted art-making sessions included Gentle and O’Brien’s¹⁴⁾ study of group

art-making in Australia and Susan Potter's¹⁵⁾ visual art activity sessions that included drawing, collage, clay, and wirework.

In terms of studies that examined a single art activity, such as a music session, Wilson and MacDonald's¹⁶⁾ study involved a music workshop for 37 disabled people. The sessions primarily included group music exercises followed by instrumental training (e.g., guitar, singing) and original songwriting. Mohatt et al.'s¹⁷⁾ study examined drawing sessions in which participants with mental disabilities painted large murals in public spaces, designed murals, and planned activities.

In terms of overall numbers, of the 12 research papers, 7 conducted sessions that involved art-making. Although the sessions had different names, the content tended to be similar. In the literature reviewed, participants in the studies with art-making sessions were mainly mentally disabled people who were able to make simple objects on their own. However, those with intellectual disabilities, learning disabilities, multisensory disabilities, etc. who required assistance were introduced to art-making in a more gradual manner, mainly through art appreciation, choral singing, and communication.

5.2. Satisfaction and the changes resulting from it

In the target literature, the satisfaction gained from arts activities/workshops has been described in various terms. In terms of quantitative results, it was validated with scores on psychological scales and questionnaires such as the WEMWBS, the PHQ-9, the GAD-7, the SI, client satisfaction questionnaires, and randomized controlled trials. The results showed that artistic activities significantly increased the satisfaction and happiness of people with disabilities.

On the other hand, in the qualitative results (Table 13), the satisfaction of people with disabilities was divided into two categories: personal satisfaction and social satisfaction. Personal mental satisfaction was specifically mentioned in many studies. Vogelpoel and Jarrold¹²⁾ found that the mental satisfaction of people with disabilities who participated in art activity sessions increased, and mentioned that such activities were also helpful in sharing their experiences, reducing their social isolation, and partially reducing their stress. In this context, participants felt their social roles as women/men through art-making, leading to emotional normalization; participants became proud of their work, believed in their abilities, and generated a positive self-image. Wilson and Sharpe⁷⁾ found that the Zinc Arts ArtZone program helped participants to change on a personal level by increasing their empowerment, self-confidence, and motivation, and on a social level by building relationships between participants, between participants and staff, and between participants and the group around them, which led to friendship and mutual trust. In questionnaires about the art project, some of the participants wrote: "By participating in the group, I was able to build relationships with other patients in the ward" and "I like to be connected with people." Another participant stated: "I like to work on each art-making individually," which signifies that they did not want to work on art-making in a group.

Additionally, a recent study by Rainbow et al.¹⁸⁾ on the intervention effects of music sessions on a group of people with intellectual disabilities found that the intervention promoted their behavioral and psychological well-being. It stated that they became more expressive in both verbal and non-verbal communication. Another study by Wilson and MacDonald¹⁶⁾ targeted people with learning disabilities and stated the participants' confidence improved as a result of the music sessions, and that they were happier and more relaxed.

As mentioned above, people with disabilities found that their psycho-social satisfaction was improved by the art activity sessions. Continuing the sessions not only satisfied the people with disabilities themselves, but also facilitated the creation of a symbiotic society and the provision of new ideas for communication art¹³⁾.

6. Conclusion

This study aimed to analyze and organize the trends of research in foreign papers on the satisfaction provided by art activities/workshops to people with disabilities in order to obtain knowledge that would facilitate future Japanese research. The following suggestions were obtained by analyzing the examined papers' research questions and research methods, the attributes of their subjects, the content of the sessions conducted, and the satisfaction derived by the participants.

Regarding the level of evidence in the target literature, the qualitative studies (the qualitative research part of the mixed studies) had an overall high JBI evidence level, with five of the nine studies reaching Level I. The qualitative assessment in the literature included in this study met the checklist high level and was seen as reliable and scientifically conducted and validated. In contrast, the literature review, randomized controlled trials, and expert opinions were seen as not having a high JBI evidence level, based on the overall judgment of description methods, sample size, and study design.

Among the overseas research methods, there were few research designs that used only qualitative or only quantitative studies. In contrast, there were many studies that used mixed research, where qualitative research was used to supplement data on particularities that quantitative research could not explain, or where quantitative research was used to supplement generalities that qualitative research could not reach. On the other hand, in Japan, research on artistic activities and their workshops aimed at improving the satisfaction of people with disabilities is still mostly qualitative research, and no mixed research has been found. In the future, it will also be necessary to visualize and show data on the impact of artistic activities, which are a promising route to promote artistic activities for people with disabilities, to help them reintegrate into society and to support their leisure time.

Among the results of overseas studies, it was found that creative artistic activities such as art-making and other activities in which participants voluntarily made things and created artworks have been more common than single art sessions. The sessions had a positive effect on both individuals with disabilities and society, and specifically on the individual level, they focused on the inner life of the person, citing "Return to daily life" and "Mental well-being". At the social level, the focus was on the external aspects of the person: "Promote communication and social participation" and "Draw out artistic creativity". Either way, both the internal and external content categories emphasized "human connection" and "communication. Perhaps the promotion of communication and a return to community will be extremely important points in the process of improving satisfaction. By the way, among such results, the artistic skills of the participants were also mentioned. However, no special attention was paid to the development of participants' artistic skills or training of techniques, which suggests that the target literature of this study was not to find artists with disabilities, but rather to help isolated individuals achieve mental health and promote social and community participation. On the other hand, there was a lot of bias in the research subjects, and many of the research subjects were mentally disabled. It was suggested that there is a need to report on people with other disabilities in the future. Therefore, many studies in Japan have examined how the participants (people with disabilities) were able to change, reintegrate into society, build human relationships, and connect with their surroundings through artistic activities, rather than their artistic skills and techniques, and whether they were able to return to social relationships and normal life.

About the discussion, there are two main implications for research in Japan. One is related to research methodology, which is that the reliability of research can be increased by using mixed studies. The other is that in order to improve the Well-Being of people with disabilities, it is necessary to focus on "participation" and "communication" as mediated by artistic activities.

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REVIEW ARTICLE

The Significance of Independence in Japan's Long-term Care Insurance Act

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ABSTRACT

This paper examines the meaning of the term *independence* as stipulated by Japan's Long-term Care Insurance Act. Although this law aims to support the independence of those requiring long-term care, the term itself is not clearly defined. While it is possible to understand the meaning of "independence" as one interpretation of "care prevention" and "self-selection" as specified in Article 2 of the law, this paper explores the meaning of the term by analyzing from various perspectives the process of establishing the long-term care insurance system. As a result, we found "care prevention" and "self-selection," although the meaning of independence in long-term care insurance varies depending on factors such as services, care management, insurance systems, and user contracts. In summary, Japan's long-term care insurance guarantees the daily life of those requiring care by utilizing necessary services, and their independence was confirmed that the improvement of their quality of life, the maintenance and improvement of their mental and physical conditions, and the prevention of care needs through self-determination and choice.

Keywords: Support for independence, Self-selection, Self-determination, Preventive care, Mental independence

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1. Introduction

This paper examines the meaning of independence as stipulated by Japan's Long-term Care Insurance Act. This law was enacted in 1997 and implemented in 2000. Article 1 states that "necessary services will be insured in accordance with the abilities of those requiring care so that they can lead an independent daily life." This is the provision for supporting the independence that long-term care insurance aims to achieve. To embody this, Article 2 specifies that "insurance benefits will be provided with the aim of reducing or preventing the worsening of the state of care required and service will be provided based on the insured's choice."

Although the term *independence* is not clearly defined in the Long-term Care Insurance Act, one understanding of the term is "care prevention" and "self-selection," which can be read from the Article 2 regulations. The self-selection referred to here is the independence that has long been emphasized in social welfare practices in Japan. In the Social Welfare Basic Structure Reform in the 1990s, which aimed to introduce the usage contract into social welfare, this was also emphasized as one of the key concepts. The Social Welfare Basic Structure Reform was a reform aimed at reevaluating the common foundation of social welfare, which includes social welfare services, social welfare corporations, and measures systems, and which had not undergone significant revision since the enactment of the Social Welfare Services Act in 1951. Welfare was primarily based on local government decisions, known as "measures," to determine service providers and service content. However, the previous reform introduced a "usage contract" system, allowing users to choose service providers and welfare services. In other words, it represents a significant shift towards a user-oriented approach in the social welfare system at a structural level.

Since the establishment of the support for independence in the Social Welfare Act of 2000, which was enacted as a result of the 1990s reform, supporting independence has become a fundamental principle in various welfare systems. Long-term care insurance, which was established through the Social Welfare Basic Structure Reform, is no exception. This insurance system has undergone several revisions, including a shift to a prevention-oriented system in 2005, a strengthening of the care service infrastructure in 2011, revisions to promote comprehensive healthcare and long-term care in local communities in 2014, and a strengthening of community-based integrated care systems in 2017. These revisions have aimed to strengthen preventive care and promote a community-based society. Community-based society is a society in which all people, including children, individuals with disabilities, and the elderly, can live in their communities with a sense of purpose and mutually enhance each other's lives.

Despite these various revisions to the Insurance Act, there have been no major changes to the aforementioned provisions regarding support for independence. More than 20 years have passed since the implementation of long-term care insurance, and the provisions related to independent support have remained consistent in the law. Is this support for independence really sufficient with just "care prevention" and "self-selection"? Furthermore, what does "independence" truly mean within the context of independent support? Returning to the fact that the law does not provide a clear definition of independence, this paper aims to explore its meaning. However, it should be noted that this situation is not limited to Japan alone. For example, in France, which established a long-term care security system around the same time as Japan, the term "autonomy" is included in the system's name, but there is no legal definition of autonomy within the law¹⁾. South Korea, another Asian country, has initiated the Long-Term Care Insurance for the Elderly system since 2007. It should be noted, however, that the concept of "independence" is not defined in the legal text of this system either.

While there is no explicit legal definition, universities that educate welfare professionals in Japan often teach and examine the meaning of independence as part of their education. Independence/Autonomy is not a concept with a single, fixed definition; rather, it is multifaceted and can evolve over time or be interpreted differently depending on the context. This is why it is crucial for students aspiring to become professionals in fields like social work, where interpersonal assistance is key, to thoroughly examine the meaning of independence. Furthermore, there is a need for research that explores the meaning of independence as a contribution to this education.

As one aspect of this exploration, this paper will focus on Japan's Long-Term Care Insurance Act. What does the term "independence" as stipulated in this law truly signify? In the following sections, we will examine previous research, investigate the establishment process of long-term care insurance, and explore the system's content to reflect on the meaning of independence. This is the objective of this paper.

2. Review of Previous Studies

Previous studies examining the meaning of independence/autonomy in relation to social welfare have been numerous, such as Nakamura²⁾, Ooizumi³⁾, and Sasanuma⁴⁾. This is particularly evident in the welfare of people with disabilities based on the Independent Living (IL) Movement and the principle of normalization (Yoshimoto⁵⁾, Terada⁶⁾, Nakamura and Itayama⁷⁾, Taniguchi⁸⁾, Sadato⁹⁾, etc.). For example, Sadato defined the concept of independence based on the philosophy of the IL Movement as follows: "The act of living by deciding on one's own responsibility for one's own life and living style, and choosing the goals and lifestyle one desires, even if the disabled person needs the care of a caregiver in daily life."⁹⁾ This idea of self-reliance is well-established in social welfare, but what about the self-reliance outlined in long-term care insurance? In this section, we focus on studies on the theme of independence in long-term care insurance and examine previous studies on the subject.

Mitsui considered the independence of older adults prior to the establishment and implementation of the Long-term Care Insurance Act. He examined the preventive provisions and pilot project plans specified in Article 4 of the law while citing the self-selection provisions in Article 2, and concluded that the long-term care insurance policy was based on the idea that "the condition of the care recipient should be changed and improved by providing services."¹⁰⁾ Although providing support for independence towards a more active life has significance, Mitsui proposed that "if one wants to spend their days in a peaceful state, ... that too should be considered a valuable choice, one way of being independent."¹⁰⁾ The foundation of the philosophy is self-selection and self-determination, but his analysis indicates that long-term care insurance places value on physical and personal independence that does not require services and strives to advance in that direction. Omori and Ikeda, in contrast, analyzed the usage contract through long-term care insurance and argued that the meaning of independence was "self-determination."^{11,12)}

Sato studied the provisions of Articles 1 and 2 of the Long-term Care Insurance Act regarding support for independence and pointed out that the concept of independence is itself not regulated. He suggested that "independence may refer to leading one's own life in the fullest possible way within the limits of one's abilities, actively participating in and creating one's own life."¹³⁾ Sato views "wanting to do something" as being linked to independence¹³⁾. Okunishi, on the other hand, positions the concept of self-determination as the foundation for supporting independence, and from that perspective, examines how older individuals make decisions. If long-term care insurance is considered social care, then "the foundation for supporting independence is that older individuals should not be isolated in the process of making decisions regarding

service use. Their self-determination should be respected to the greatest extent possible, ensuring that everyone involved in the decision-making process has an equal relationship."¹⁴⁾

Okabe positioned long-term care insurance as a system on the way from a medical model to a lifestyle model based on nursing in medicine. He suggested that in long-term care insurance, "there is pressure to pull back to the medical model side by substituting independence with assistance for treatment, including rehabilitation."¹⁵⁾ Okabe posited that the system is based on a limited decision-making model in which the "user's autonomy is self-determined within the range of the level of care required that has been determined."¹⁵⁾

Hatta, referring to the materials on the shift to a prevention-oriented system put forth in the 2005 reform, pointed out that "it is understood that the support for independence is to provide care prevention."¹⁶⁾ She also warned that the independence emphasized in this reform "is nothing more than a demand for independence from services, especially for those who are mildly ill."¹⁶⁾ The study asks, "Wasn't independence support, in the first place, about providing support according to each individual's situation while respecting the individual's self-determination?"¹⁶⁾

Taniguchi claims that the concept of independence stipulated by long-term care insurance is "in theory, a life that is unique to the person based on self-selection and self-determination, but in reality, the structure of the services provided demands economic and personal independence from the users."¹⁷⁾

As this review of previous research, reveals, there is no unified definition or perspective on the meaning of independence stipulated by the Long-term Care Insurance Act. However, "self-selection" and "self-determination," which were established in interpersonal assistance in social welfare, can be identified as a common understanding. Mitsui¹⁰⁾, Okabe¹⁵⁾, and Taniguchi¹⁷⁾ emphasize the improvement of activities of daily living (ADLs) as a direction for the system. Hatta¹⁶⁾ similarly points out the need for a thorough revision of the law for preventive care needs. Thus, it can be understood that there are two broad meanings for independence: one is the meaning of self-selection or self-determination, and the other is the meaning of aiming for physical and daily living independence by improving the condition of care needs.

Based on the above, from here on out, we will examine the meaning of independence from the perspective of the Act on Social Welfare for the Elderly and the Health and Medical Service Act for the Elderly, which has not been widely addressed in previous research. We will also examine it from the report on the establishment process of the long-term care insurance system. In addition, we would like to attempt an examination from various other perspectives, including from the viewpoints of fiscal policy through social security structural reform and the content of the system.

3. "Independence" in the Background to the Establishment of the Long-term Care Insurance Act

3.1. The Elderly Welfare Act and Elderly Healthcare Act

The concept of self-reliance has been a fundamental principle in Japan's welfare system since the establishment of the Advisory Council on Social Security in 1950. The council recommended guiding and nurturing those in need to be able to live independently. This idea has been reflected in various welfare laws enacted before and after World War II, mainly expressing self-reliance as rehabilitation. For example, the Physically Disabled Persons Welfare Act defined rehabilitation as "overcoming one's disability and actively participating in social and economic activities." In the 1984 revision of the law, the word rehabilitation was changed to "efforts towards independence." As seen in the definition by Sadato, independence is not limited to overcoming a disability or becoming economically self-sufficient⁹⁾.

Regarding elderly welfare, there have been no provisions for rehabilitation or independence in the Elderly Welfare Act

since its enactment in 1963. Remember, however, that the 1997 Long-term Care Insurance Act is based on the principle of supporting independence. When the Elderly Welfare Act was revised in 1997, Article 10, section 3, which regulates the implementation of administrative measures, included the phrase "the most appropriate support for leading an independent daily life," reflecting the concept of independence.

The purpose of the Elderly Welfare Act is to take necessary measures to maintain the physical and mental health and stability of the lives of older adults. The basic principle is to respect older adults and guarantee a healthy and peaceful life with a sense of purpose. It has been suggested that the goal of restoring disabilities to their original state, or overcoming disabilities and participating in employment, which was previously pursued by disability welfare, is not appropriate for elderly individuals.

Now, what about the Elderly Health Act established in 1982? The purpose of this law is to comprehensively implement health promotion measures, such as disease prevention, treatment, and functional training, to ensure health and proper medical care in people's later years. The basic philosophy is based on the spirit of self-help and solidarity, striving to maintain and promote health by being aware of the physical and mental changes that come with aging, and fairly sharing the cost of medical care for older adults. There is no provision for independence in the law's purpose or philosophy, but the concept of healthcare, including disease prevention and improvement/maintenance of one's condition, is naturally stipulated. Article 18 stipulates that functional training is "performed for persons whose physical and mental functions have declined to help maintain independence in their daily lives."

Long-term care insurance integrates under one system the in-home welfare services and elderly welfare facilities (such as nursing homes for older adults) specified in the Elderly Welfare Act and the medical services aimed at the subjects of the Elderly Health Act. The purpose of long-term care insurance is to support the independent daily life of users. If viewed from the perspective of the philosophy of the Elderly Welfare Act, this independence can be interpreted as having a fulfilling life and healthy, and peaceful life. From the perspective of the Elderly Health Act, independence includes the improvement, maintenance, and prevention of physical and mental conditions.

3.2. The Process Behind the Creation of Long-term Care Insurance

It is well known that the background to the establishment of the Long-term Care Insurance Act was the growing problem of older adult care due to factors such as longevity, an increase in the older adult population, women's social advancement, and smaller household sizes. The expected increase in the need for care could not be met by the existing older adult welfare system, which prioritized family care and low-income individuals. This led to the need for a universal system that could be utilized by a wider range of elderly individuals in need of care. In response to these challenges, the 1989 Care Measures Study Group Report recommended a focus on home-based services and the introduction of a social insurance system¹⁸⁾.

This report was compiled as policy support material for the formulation of the Ten-year General Strategy for the Promotion of Health and Welfare for Older Adults. The ideas in this report have been followed not only in discussions of the Elderly Total Plan Study Group (a research group of the Ministry of Health and Welfare's Department of Health for the Elderly), which conceived of long-term care insurance as a response to the social risk of elderly care but also in various discussions towards the establishment of full-fledged long-term care insurance. For example, the Older Adults Care and Independent Support System Research Group, established in July 1994 within the Ministry of Health and Welfare's Elderly Care Measures Headquarters, stated in their December report that the promotion of older adults' independence was the

basic principle for elderly care in the new system, meaning the long-term care insurance system under consideration. They pointed out that "due to the aging of the population, older adults' care has shifted from end-of-life care to care that supports daily life," and that future care for older adults should "support the ability of elderly individuals to live independently and with a high quality of life based on their own will."¹⁹⁾ The basic support principles based on this philosophy included an emphasis on older individuals' self-determination, prevention, and rehabilitation.

Based on these ideas, the Long-term Care Insurance Act was enacted. Upon examination of the various reports²⁰⁾ issued during the process of its enactment, the reasons for the act's emphasis on independence become clear and can be summarized in two points:

1. The need to prioritize care that supports daily life and improves its quality to respond to the prolonged need for care resulting from increased longevity.
2. The need to shift from care focused on assistance with daily needs such as meals and personal care to care that supports an active and motivated daily life.

According to the reports, the reason for long-term care insurance is to enable users to live their daily lives without any hindrance and improve their quality of life by utilizing services, while aiming for an active and motivated daily life. The contents of independence include expressing one's intention, choosing and deciding on one's life, and living a proactive life. Efforts towards physical and mental independence, such as prevention and rehabilitation, are also included.

If we apply Taniguchi's typology of the concept of independence in disability welfare to the contents of this independence, expressing one's will, making choices, and self-determination are considered mental independence, while a motivated daily life is regarded as either mental independence or social independence^{8,21)}. Regarding personal independence, Taniguchi defined it as "requesting caregivers to use methods that are necessary, appropriate, and safe for the disabled person, and enabling quick and comfortable care"⁸⁾ and stated that this independence does not necessarily mean that the person can perform all daily living activities alone.

The assessment survey for long-term care insurance, the ADL/IADL (instrumental activities of daily living) scale, is primarily based on the ability to bathe, defecate, shop independently, manage medication, and other factors, taking into account medical and physical conditions from the perspective of evaluating the burden of care. The level of care needed is determined by this assessment survey, and a support limit is set accordingly, within which public services are provided. From the perspective of the service guarantee based on the level of care needed, long-term care insurance can be considered to use the ability to perform daily activities independently as the standard for physical independence.

3.3. Through the Lens of Social Security Structural Reform and System Content

To understand the long-term care insurance system accurately, it is necessary to consider fiscal policy. This legislation was enacted as a step towards social security structural reform²²⁾. The reform centers on fiscal policies related to social security, such as reducing skyrocketing medical expenses for older adults in response to an aging population and raising the age at which old-age pensions begin. The establishment of long-term care insurance was primarily aimed at rebuilding ailing medical insurance finances and separating older adult care from medical insurance. The medical expenses associated with services that transitioned from the older adult healthcare system to long-term care insurance were approximately 20

percent of the former medical expenses for older adults²³⁾. The transition of these services to long-term care insurance has led to cost containment through the calculation of nursing care reimbursements based on lower unit numbers than medical care reimbursements.

A second aim was to restrain not only medical but also all expected increases in social security-related expenses as much as possible (Act on Special Measures Concerning Promotion of Fiscal Structural Reform, Article 7). The long-term suppression of increasing care costs within the framework of universal social care was also a factor in the creation of the nursing care insurance system, which was established in response to the anticipated social risk of the growing demand for care. This can be inferred from the estimates made by the Ministry of Health, Labour, and Welfare (formerly the Ministry of Health and Welfare)²⁴⁾. From the perspective of such fiscal structural reform, the independence of long-term care insurance emphasizes the maintenance and improvement of health, active prevention, and improvement of ADL.

Next, in the process of establishing long-term care insurance, the adoption of a social insurance system has been prioritized. The social insurance system can raise insurance premiums or the ratio of self-payment if benefit payments increase, and it can also take harsh measures such as suppressing or suspending benefits for those who do not pay premiums or have arrears. As a system to correspond to universalization, long-term care insurance has become a system that collects insurance premiums from insured persons who are designated for older adults' care protection and pays insurance benefits for the risk of requiring long-term care. Service recipients pay a uniform self-payment, and half of the insurance benefits, excluding user payments, are covered by insurance premiums, and the remaining half is covered by public funds (25 percent by the national government, 12.5 percent by prefectures and municipalities; 20 percent by the national government, 17.5 percent by prefectures and 12.5 percent by municipalities in the case of facility benefits). Rather than relying on social assistance, the system sought financial resources in the form of insurance premiums, which are easily visible and have a clear purpose and adopted the insurance principle of the obligation to pay insurance premiums and the guarantee of the right to receive benefits, similar to medical insurance. The proportion of burden for the national treasury in the welfare system of the Elderly Welfare Act was 50 percent, but under the long-term care insurance system, it was reduced to 25 percent (20 percent for facility benefits). The system sought to be operated by regional sovereignty with municipalities as the insurers.

While long-term care insurance has indeed universalized care for older adults and others, it has also led to a transformation of social welfare, by changing the way social welfare is provided to people who need active support. This is partly due to its establishment as a social welfare infrastructure reform, linked to social security structural reforms. While there is no need to explain this infrastructure reform, the universalization of social care has been built through revising welfare systems and fiscal structures, introducing self-pay obligations for insurance premiums and service fees, introducing usage contracts, granting the right to choose, unifying the care assessment system, promoting community welfare, and individualizing and streamlining services through the introduction of care management.

If we consider independence from the perspective of social insurance, which is the foundation of this system, independence can be seen as improving or maintaining the state of requiring long-term care, which is a risk covered by insurance. At the same time, independence can also be seen as living daily life while utilizing long-term care services. From the perspective of the usage contract, although the assessment examination at the time of application is an administrative disposition, after certification as requiring care, the user is granted the right to choose service providers and services, and independence can be seen as self-selection and self-determination. From the perspective of care management,

this is the coordination of service resources for individual needs, and by providing information on these resources, care managers encourage users to make their own choices and decisions, which can be considered as independence. Alternatively, improving the quality of life through the use of services aimed at achieving care plan goals can also be considered a form of independence.

4. Discussion: The Meaning of Independence in Long-term Care Insurance

As discussed, emphasis on the meaning of independence, as stated in the Long-term Care Insurance Act, varies depending on what it is based on. The lack of a unified view in previous studies is due to this reason. In other words, long-term care insurance is a system that supports the daily lives of individuals requiring care from a comprehensive perspective based on the community, utilizing informal resources, and spanning the fields of health, medicine, and welfare. This includes the concept of preventive care centered on individuals requiring support and primary prevention to prevent such conditions from occurring. Therefore, it is not appropriate to consider only one aspect when considering independence. From the perspective of the usage contract, independence emphasizes self-selection and self-determination. From the perspective of welfare services based on the Elderly Welfare Act, emphasis is placed on a fulfilling life, and from the perspective of health and medical services, improving and preventing conditions are emphasized.

Let's confirm how the issues we have considered so far are regulated by the Long-term Care Insurance Act. When considering the meaning of independence as a social insurance for people requiring care, the insurance system guarantees necessary care services for those people and allows them to live their daily lives while using those services. This basic principle is stipulated in Article 1 of the Long-term Care Insurance Act. Self-selection and self-determination, as considered through usage contracts or care management, are stipulated in Article 2, paragraph 3 of the Long-term Care Insurance Act. Improvement and prevention of ADL, as considered from the perspective of healthcare services or financial structure reform, are stipulated in Article 2, paragraph 2 of the Long-term Care Insurance Act. Regarding the expression of intentions and subjectivity as seen in the report on the establishment process, it is summarized in the self-selection provision of Article 2, paragraph 3. The efforts towards physical and personal independence seen in the same report are stipulated in Article 4 of the Long-term Care Insurance Act.

Since the 2005 amendment to the Long-term Care Insurance Act, Article 1 has included the preservation of dignity. The purpose of providing necessary services through insurance benefits is to ensure that care recipients can maintain their dignity and live independently in their daily lives according to their abilities. In social welfare practice, preserving a client's dignity is a fundamental principle, which is associated with individualization, self-determination, and quality of life. To summarize the above consideration, we can conclude that long-term care insurance guarantees that care recipients can lead an independent daily life by utilizing necessary services, and this independence can be outlined as follows²⁵⁾:

1. Users determine their own way of life, make self-selected choices for the necessary services, and actively lead their lives to improve and maintain their quality of life.
2. To make efforts to improve, maintain, and prevent conditions requiring nursing care, etc., according to residual ability and the circumstances in which they are placed.

The concept of independence in point one is likely to be the same as that in the field of social welfare. According to a

mainstream Japanese dictionary, independence is explained as "acting and living on one's own without relying on help from others."²⁶⁾ In a dictionary of social welfare terms, it is explained that "independence includes physical independence, mental independence, economic independence, and social independence. Living independently means living in a self-determined and selective manner while receiving support such as nursing care, and it is necessary to seek support methods that guarantee this."²⁷⁾ The major difference between these two explanations is between independence that does not require services and independence that is achieved while actively utilizing services. The independence described in the mainstream dictionary is based on the idea of not relying on anyone else and is centered on healthy people or those with occupational abilities. The independence defined in the dictionary of social welfare terms is centered on those who require some form of support. Therefore, the basic goal is to achieve independence through the use of welfare services. In this context, there is physical, mental, economic, and social independence, which serve as goals to be aimed for depending on the situation and problems faced by the service user.

In the context of long-term care insurance, self-sufficiency defined in point one refers to mental or social independence. This means that individuals can determine their own quality of life, improve their quality of life by utilizing long-term care insurance services, and live independently. For users who have decreased decision-making ability due to conditions such as dementia, the Adult Guardianship System has been established as a measure to protect their rights.

Next, let us consider the improvement, maintenance, and prevention of conditions requiring care, etc. mentioned in point two. Based on the ADL scale of the long-term care insurance system, some practical reports and research studies define independence solely as the improvement of one's condition. While improvement is certainly significant, it is not appropriate to consider only the physical aspects of independence since it is a natural process for older adults to gradually experience declines in these functions.

This is because if physical independence is defined as the absence of paralysis or disability and a high level of ADL, individuals with chronic disabilities will never achieve physical independence throughout their lives. While the dictionary of social welfare terms defines independence as living actively even while receiving care, this does not align with the concept of physical and mental health being the basis for independence. Moreover, if independence is judged by whether one can break away from services, there is no independence for individuals with chronic or severe disabilities. This also applies to elderly individuals requiring care.

The term *dependence* is used as the opposite concept of independence. If independence is defined as not being dependent, then it is not based on physical or service-related aspects, but rather on one's own will and actions, and the ability to not be emotionally dependent. Therefore, improving and maintaining the need for long-term care does not simply mean improving one's ADL and becoming self-sufficient in daily life. Depending on the residual abilities of each user, it means utilizing necessary services to improve and maintain their living conditions and physical and mental states and prevent deterioration based on living with spiritual and social independence according to their residual abilities.

5. Conclusion

As discussed earlier, within the framework of the Long-Term Care Insurance Act, the concept of "independence" can be analyzed to include elements such as "care prevention," "self-selection," and "self-determination," as evident from Articles 1, 2, and 4 of the Act. Simultaneously, it can be concluded that there is no consistent and explicit definition of independence within the Act. In a system guided by the principle of supporting independence, it is

imperative to establish a clear definition of independence and subsequently undertake the necessary system revisions. With this in mind, this paper provided a tentative definition. It was also a discussion to ask the interpersonal assistance profession and the students who aspire to it, once again, what independence means.

While this paper discusses Japan's Long-Term Care Insurance Act, its examination of the concept of independence is primarily limited to the law's creation process and system content. It has not been able to assess the law since its enactment in 2000 or consider the perspectives of frontline staff and users involved in promoting independence. It also fails to mention the situation in other countries that have long-term care security systems. These represent the challenges of this study. Based on this research, the author will continue to explore the meaning of independence and address these issues one by one.

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SHORT PAPER

Influence of Kyphosis Posture on Lower Extremity Joint Moment Power during Walking

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ABSTRACT

This study was conducted in order to investigate the effect of kyphosis alignment during walking on lower extremity joint power at the stance phase in healthy participants. The composite components of lower extremity joint power in three axial directions were calculated by using a three-dimensional motion analyzer in 15 healthy adult male participants. Two postural conditions, viz., a normal posture (normal posture) and a kyphosis posture with a brace (kyphosis posture), were used. The average and maximum values of joint power in the early, mid, and terminal phases of stance were compared. In the early stance phase, the average, and maximum values of lower extremity joint power were significantly different at the hip and knee joints. The hip joint power was significantly different in the terminal stance phase. The values of hip and knee joint power were significantly different in the terminal stance phase. The workload and work rate increased with hip power in the normal posture and with knee power in the kyphosis posture.

Keywords: Joint power, kyphosis posture, walking

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1. Introduction

The joint moment power (joint power) in walking motion is defined as the product of joint moment and joint angular velocity and is a mechanical parameter which indicates instantaneous force, i.e., the work rate. Furthermore, the joint power can infer the contraction pattern of the muscle group which exerts the joint movement. Positive work of joint power is the work done during a concentric contraction, whereas negative work is the work done during an eccentric contraction. Hence, joint power is considered a clinically important index which can estimate the positive work (energy generation) and negative work (energy absorption) of each joint during walking¹⁾.

There are several previous studies on healthy participants and patients with lower extremity joint diseases. The effects of walking speed²⁾ and differences in conditions such as level ground and slopes³⁾ were considered in the case of healthy participants. Studies were focused on during walking in patients with knee osteoarthritis and patients after total hip replacement surgery as regards patients with lower extremity joint diseases^{4,5)}. It has been reported to affect distal adjacent joints in addition to decreased joint power due to functional impairment of the affected articulation^{5,6)}. In contrast, it has been reported that malalignment of the proximal trunk and postural changes in the standing posture exert a significant impact on lower extremity alignment^{7,8,9)}. A study focusing on differences in standing postures reported that when the trunk is tilted forward (trunk flexion) in healthy participants, the hip joint flexion angle increases as a compensatory movement¹⁰⁾, the hip extension moment increases¹¹⁾, and the activity time is prolonged¹²⁾ in the early stance phase during walking. The peak moment and angular impulse of hip flexion have been reported to decrease during the mid-stance phase¹³⁾. In the knee joint, the trunk flexion affects the knee joint moment during the entire stance phase, which increases the activity of the lateral hamstrings¹⁴⁾. These studies have provided some insights into the effects of postural changes on lower extremity joints. However, there are no studies which have analyzed in detail the characteristics of joint power dynamics and the contraction patterns of muscle groups.

Therefore, this study was conducted to investigate the effect of kyphosis alignment during walking on lower extremity joint power at the stance phase in healthy participants.

2. Methods

2.1. Participants

This study included 15 healthy men (mean \pm standard deviation; age 26.40 ± 6.49 years; height 169.20 ± 4.49 cm; weight 67.40 ± 10.14 kg) with no previous orthopedic, neurological, respiratory, or circulatory diseases, excluding those with a kyphosis alignment in a quiet standing posture. The walking ability of the participants was 1.58 ± 0.17 m/sec at 10 m walking speed and 283.98 ± 29.71 m at 3 min walking distance. Participants had no history of falls or symptoms of back or knee pain.

This study was approved by the Ethics Committee of the Kohshinkai Ogura Hospital (2018-A1). The participants were informed about the outline of the study in the research consent form, and their consent to participate in the study and signatures on the consent form were obtained. Participants were invited to participate in the study by displaying posters at the campuses of the research institutions.

2.2. Motion task

The task was walking, and the following two postural conditions were used: a posture with no specific regulations (normal posture) and a kyphosis posture with a brace (kyphosis posture).

2.3. Measurement

A trunk orthosis, a Vicon MX-T three-dimensional motion analysis system with ten infrared cameras (Vicon Motion Systems Ltd., Oxford, UK), and six force plates (AMTI Inc., Watertown, MA, USA) were used for measurements. First, a three-point fixation of the sternum, abdomen, and back was performed by using the orthosis in maintaining a thoracolumbar kyphosis position. The brace angle was set to 160° (Fig 1), and the brace was implemented after confirming that the angle between the lines connecting C7-Th9 and Th9-S3 showed a kyphosis posture of 25°–30°. The angles of the neck, hip, and knee joints were not set but were left to the subject's discretion to facilitate maintaining the kyphosis posture. Second, 33 reflective markers were placed on body markers. The sampling rate was 100 Hz, and the marker coordinate data and the force plates were processed by applying a low-pass filter at 6 and 10 Hz, respectively. An eight-link segmental model was created by using Body Builder (Vicon) from the obtained marker coordinate data and the ground reaction force data^{15,16}, and the composite components of the lower extremity joint power in the three axial directions were calculated. The value of joint power was normalized with respect to participant body mass.

The participants walked on a 10-m walkway which was set up with an acceleration interval at the start of walking and a deceleration interval of 2 m at the end, and measurements were taken after three to five practice sessions for each condition. The walking speed with a stride length of 0.7 m and a walking rate of 117 steps/min was specified. The walking rate was set to the sound of an electronic metronome ME-110 (YAMAHA Inc., Shizuoka, Japan), and markers were placed on the side of the walkway to serve as a guide.

2.4. Data analyses

The parameters hip, knee, and ankle joint power during the stance phase of the left lower extremity were analyzed. The stance phase was identified as the point at which the left plantar foot touched the floor and the vertical ground reaction force was ≥ 20 N^{14,17}, and the stance end point was identified when the vertical ground reaction force was < 20 N. Then, the left lower extremity stance period time was time-normalized and classified into four periods, viz., 0%–20% (early stance period), 21%–52% (mid-stance period), 53%–83% (terminal stance period), and 84%–100%, and the mean, and maximum values of joint power were calculated for each period.

2.5. Statistical analyses

The average and maximum (absolute) values of joint power in the early, mid, and terminal phases of stance were compared between normal and kyphosis postures. Statistical analysis was performed by using R4.0.2. The Shapiro–Wilk test was used in examining normality, and the two-sample t-test, and Wilcoxon's signed-rank test were used to examine differences between groups. P values of < 0.05 were considered to be statistically significant.

3. Results

The average lower extremity joint power was significantly different at the hip and knee joints in the early stance phase between the normal posture and kyphosis posture. The ankle joint power was significantly different in the mid-stance phase. The hip joint power was significantly different in the terminal stance phase. The maximum lower extremity joint power was significantly different at the hip and knee joints in the early stance phase between the normal posture and kyphosis posture. The knee joint power was significantly different in the mid-stance phase. The values of hip and knee joint power were significantly different in the terminal stance phase (Table 1).

4. Discussion

Approximately 60% of the gait cycle is the stance phase¹⁸⁾, and approximately 40% is the swing phase. Moreover, approximately 10% of the beginning and end of the stance phase is double-leg support, and the remaining is single-leg support. Winter¹⁹⁾ reported that lower extremity extensor activity is necessary for push-off against lower extremity flexion during the stance phase.

The hip joint power was high in the normal posture, and the knee joint power was high in the kyphosis posture in the early stance phase based on the results of this study. The phase from the initial contact to the loading response is a period of shock-absorbing action, which is primarily controlled by the gluteus maximus and rectus femoris muscles, the foot rocker function, and knee joint flexion motion. Particularly, the function of the eccentric contraction of the hip extensor muscle is important, and it is believed that this function is difficult to exert in the kyphosis posture although the gluteus maximus muscle generates greater support²⁰⁾ and braking force in the early stages of stance. Furthermore, even at the maximum value in the early stance phase, the knee joint power was higher than that in the normal posture. The body's center of gravity is shifted backward to the base of support²¹⁾, which requires more activity of the knee extensor muscles in the standing posture with kyphosis. Similarly, it has been reported that the knee joint extension moment increases in the early stance phase during walking¹¹⁾. This suggests that the kyphosis posture increases the workload and work rate of the knee joint extensor muscles throughout the early stance phase.

The ankle joint power was high in the kyphosis posture in the mid-stance phase. The body's center of gravity moves forward while receiving the load from the load response period, and the muscle activity of the ankle increases in the mid-stance period. Stephen et al. reported that the ankle plantar flexion moment increases as the trunk flexion increases. Moreover, the angle change ratio of ankle dorsiflexion increases in the trunk flexion position¹⁰⁾, which implies that the dorsiflexion motion that occurs after the load is transferred, is more likely to occur in the kyphosis posture. Kluger et al.¹¹⁾ reported that the ankle joint power increases during this phase, which suggests that in the kyphosis posture, the ankle joint power influences the control of dorsiflexion that occurs after the load is transferred.

The hip joint power was high in the normal posture, and the maximum knee joint power was high in the kyphosis posture in the terminal stance phase. In the terminal stance phase, eccentric contraction by the hip flexors is vital to gently shift the body's center of gravity, which reaches its apex in the mid-stance phase anteriorly and downward. Moreover, the stretching of the hip flexors (eccentric contraction) in the terminal stance phase helps in storing energy and providing support for subsequent preswing and initial swings²²⁾. A study on patients who underwent total hip arthroplasty reported that a decrease in hip joint power in the terminal stance phase is probably accompanied by an increase in ankle joint power, which may be compensated for by the action of the ankle plantar flexor muscles⁵⁾. No compensation by the ankle joint power was observed,

but it was considered that eccentric contraction by the hip joint was increased in the normal posture, and the braking action was more likely to be exerted in this study.

This study is unique as it shows that postural changes affect lower extremity joint power during gait. Hip flexion contracture has been described as a result of decrease in the peak hip extension moment²³⁾, and kyphosis posture may be susceptible to this effect. Passive joint moments during the mid to terminal stance phase have been reported to occur in the hip flexors, which contributes to a subsequent reduction in the active energy of the individual²⁴⁾. It has been suggested that exercise and movement guidance promotes normal posture and are enhances the hip power.

A limitation of this study is that the physiological kyphosis posture is not exhibited by elderly individuals; hence, it may differ from the compensatory and compensatory relationships of the ankle and hip joints described in previous studies. Moreover, it is unclear whether the thoracic spine or the lumbar spine is the cause since the entire spine is in a kyphosis posture. It is important to investigate the influences of age and participants who actually have kyphosis in the future.

5. Conclusion

This study investigated the effect of kyphosis posture on lower extremity joint power during walking in healthy participants. The hip joint power was high in the normal posture and the knee joint power was high in the kyphosis posture in the early and terminal phases of stance. The workload and work rate of the knee joint increased in the kyphosis posture.

Table 1. Joint moment power

Phase	Early-stance		Mid-stance		Terminal-stance	
Joint power (W/kg)	Normal	Kyphosis	Normal	Kyphosis	Normal	Kyphosis
Hip ave	0.66±0.22	0.46±0.18*	0.4±0.15	0.36±0.38	0.63±0.17	0.44±0.16**
Hip max	1.26±0.46	0.89±0.32*	0.87±0.32	0.63±0.49	0.91±0.21	0.79±0.26*
Knee ave	0.55±0.18	0.87±0.3**	0.29±0.17	0.34±0.2	0.18±0.07	0.24±0.11
Knee max	0.99±0.37	1.55±0.63**	0.57±0.35	0.9±0.61**	0.39±0.21	0.71±0.31**
Ankle ave	0.36±0.16	0.36±0.13	0.2±0.07	0.35±0.21**	0.6±0.19	0.64±0.28
Ankle max	0.69±0.3	0.71±0.24	0.42±0.17	0.56±0.22	2.01±0.75	2.16±1.25

Note: Data are expressed as mean ± SD. *p<0.05, **p<0.01.

Hip ave, average of hip joint power; Hip max, maximum of hip joint power; Knee ave, average of Knee joint power; Knee max, maximum of Knee joint power; Ankle ave, average of Ankle joint power; Ankle max, maximum of Ankle joint power.

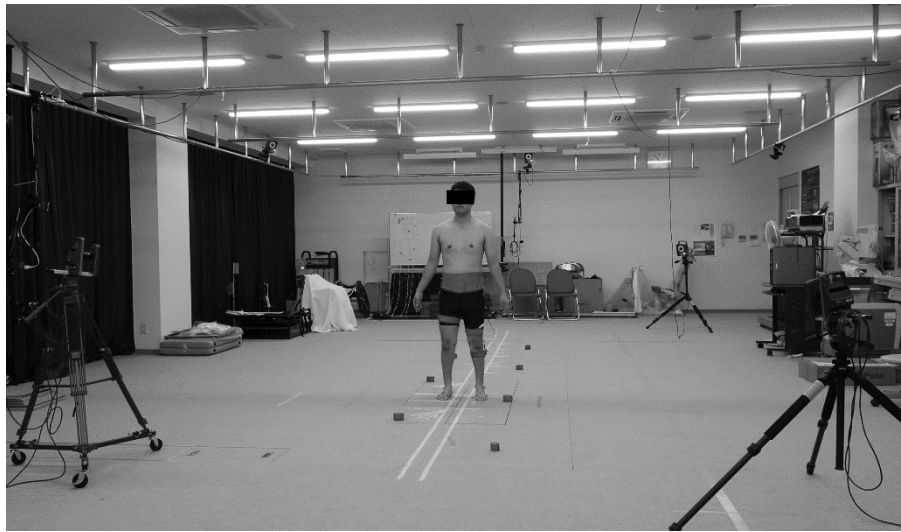


Fig 1. Measurement Environment



Fig 2. Set the angle between A-B and B-C to 160°
Adjust the length of A-B and B-C according to the target person.

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