Korean Academy of Community Health Nursing

RCPHN Research in Community and Public Health Nursing

Vol. 34 • No. 2 June, 2023

Korean Academy of Community Health Nursing

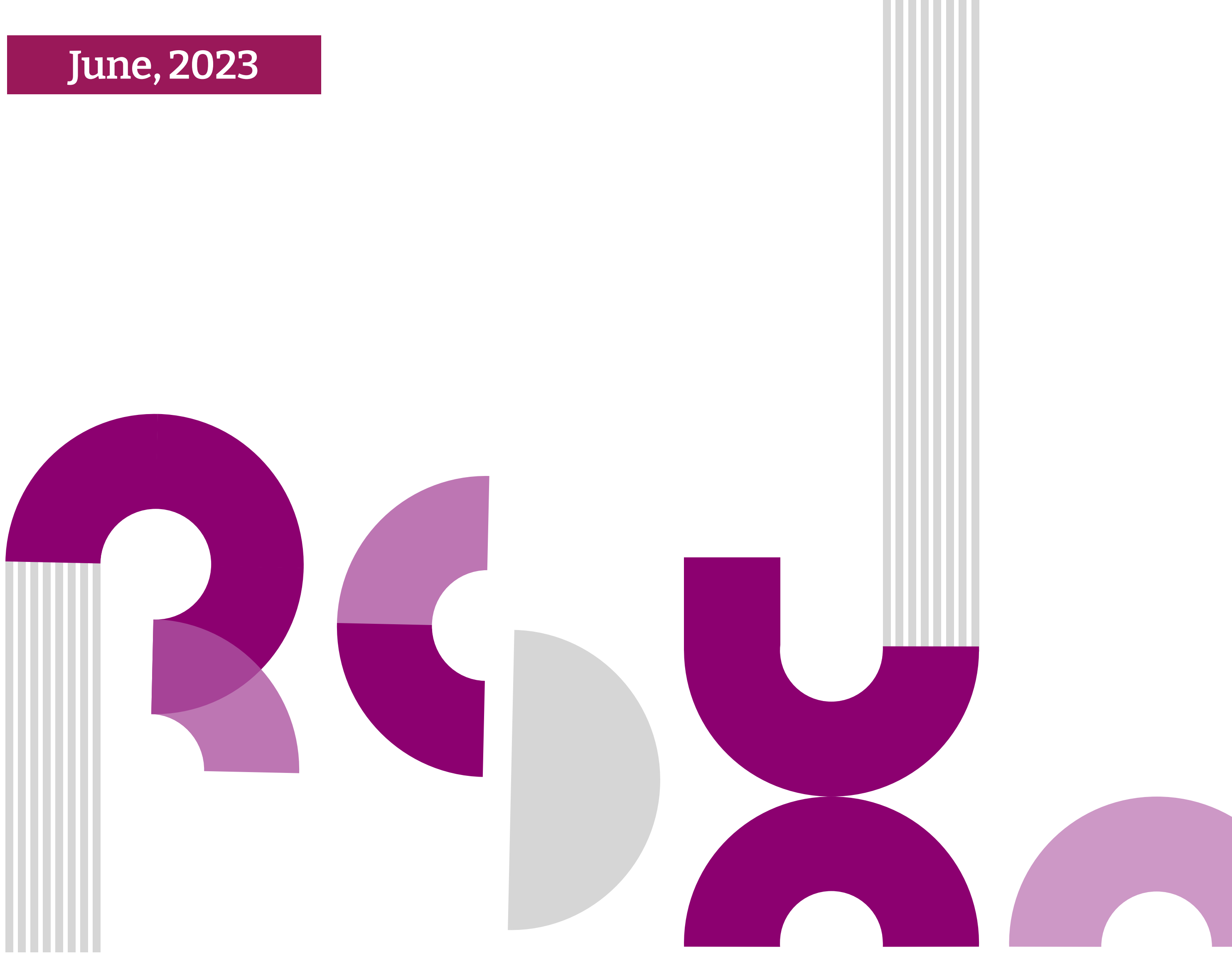
pISSN 2983-0648
eISSN 2288-4203

RCPHN

Research in Community and Public Health Nursing

Vol. 34 • No. 2

June, 2023



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http://www.rcphn.org

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pISSN 2983-0648
eISSN 2288-4203

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Vol. 34 • No. 2 • June 2023

Aims and Scope

The Research in Community and Public Health Nursing (RCPHN) is the official journal of the Korean Academy of Community Health Nursing.

RCPHN is a peer-reviewed journal published quarterly by the Korean Academy of Community Health Nursing.

RCPHN coverage includes theoretical, practical, and educational issues related to community and public health nursing. Articles include original research articles, reviews, and editorials. This journal aims to provide worldwide access to timely research and practice features of use to community health nurses, educators, school health teachers, occupational nurses, and administrators in the field of community and public health nursing.

This journal is supported by a Korean Federation of Science and Technology Societies (KOFST) Grant funded by the Korean Government.

The RCPHN is indexed/tracked/covered by Scopus, KoreaMed, Synapse, KoMCI, CINAHL and Google Scholar.

Open Access

Publisher Korean Academy of Community Health Nursing
Editor-in-Chief Young Ko

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Published on June 30, 2023

*본 사업은 기획재정부의 복권기금 및 과학기술정보통신부의 과학기술진흥기금으로 추진되어 사회적 가치 실현과 국가 과학기술 발전에 기여합니다.
*This work was supported by the Korean Federation of Science and Technology Societies(KOFST) grant funded by the Korean government.

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Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):85-95
https://doi.org/10.12799/rcphn.2022.00304

The Burden Experience of Family Caregiver of Older Adults with Chronic Illness

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Purpose: This study aims to find out further about the burden on families in undertaking caregiving for the elderly with chronic illnesses.
Methods: A qualitative study was developed using in-depth interviews with 12 family caregivers selected by purposive sampling in July 2022. The thematic analysis was then carried out using the Colaizzi method, and N-Vivo 12 Qualitative Data Analysis Software was used to assist with the content analysis.
Results: The result from the experience interview analysis of caregivers participating in this study were 54 codes which were categorized into thirteen categories. Then, they were derived into four themes, as follows: 1) Physical burden of the caregivers for the elderly with chronic illness, 2) Psychological burden of the caregivers for the elderly with chronic illness, 3) Obstacle of caregivers for the elderly with chronic illness, 4) The state of caregivers who perform caregiving for the elderly with chronic illness.
Conclusion: The experience of caregivers in undertaking caregiving for the elderly with chronic disease has many obstacles, such as physical, psychological, and economic burdens. Caregivers often find positive aspects of their experiences while caregiving for the elderly, although their burden also constantly increases. Health facilities should pay serious attention to family caregivers and facilitate programs that can help reduce the burden on family caregivers.

Keywords: Family; Caregiver Burden; Older Adults; Chronic Disease

Introduction

Non-communicable diseases (NCDs) were chronic diseases that were not passed from person to person, had a lengthy duration, and grew slowly [1]. At the time, NCDs were the top cause of death worldwide. According to WHO - NCD Country Profile data from 2018, the proportional mortality in Indonesia from NCDs were cardiovascular diseases (35%), cancers (12%), chronic respiratory diseases (6%), diabetes mellitus (6%), injuries (6%), other NCDs (15%) [2]. Furthermore, according to the Indonesia Basic Health Research 2018, the majority of NCDs such as cancer, stroke, renal disease, diabetes, cardiovascular disease, and obesity exhibited a growing tendency when compared to the previous study in 2013 [3].

Various diseases that often suffer (multi-pathological) and the increase of physical, intellectual, mental, and sensory limitations level in the elderly are indications of the need for long-term care (LTC) [4]. Long-term care for the elderly aims to maintain a level of independence of the elderly, reduce dependence, prevent complications of the disease, and maintain self-esteem, quality of life, and nutritional intake for the elderly [5]. This series of tasks and roles causes high pressure on the family, which can further

Received: November 2, 2022; **Revised:** March 13, 2023; **Accepted:** March 16, 2023
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cause families burden [6].

In Indonesia there is a culture called "Ngabdi Wong Tuwo" which is described as self-dedication to parents, this culture causes family caregivers to prefer caring patients by themselves at home rather than at the hospital [7,8]. Moreover, the family is expected to provide instrumental and emotional support to elderly individuals with chronic diseases, which can help them find meaning in life and support the fulfillment of their psychological and spiritual needs [9]. Increasing respite time, self-coping strategies, and the availability of support facilities are important strategies for enabling family caregivers to avoid providing excessive hours of care and to maintain quality of life [10]. However, preparation for becoming a family caregiver for NCDs patients in Indonesia is at a moderate level, causing an increased risk of burden on family caregivers [11].

The burdens of caregivers while undertaking caregiving for sick families over a long period are changes in emotional and physical health and stress [12]. The previous study exploring the stress of female family caregivers who care for elderly with chronic illnesses in a hospital in Sumatra, Indonesia found that four main factors such as financing, caregiver fatigue, culture and negative relationships with families cause stress on female family caregivers which can reduce the quality of life [13]. However, the current study explores how family caregivers' experience caring for elderly with chronic illnesses at home. The burden on families in undertaking caregiving for the elderly with chronic illness that requires long-term care, economic limitations, and limited knowledge of the treatments for elderly patients, will impact the emergence of uncomfortable feelings for caregivers. These need to be considered because it is crucial in determining the caregivers' interventions, recommendations, and nursing care. Therefore, the researchers want to know more about the family's burden in treating the elderly with chronic illness.

Methods

1. Aim

This study used a phenomenological qualitative design which incorporated the COREQ (Consolidated Criteria for Reporting Qualitative Studies) research reporting checklist [14]. Individual semi-structured interviews were conducted to ascertain the families' perception of the burden of undertaking caregiving for the elderly with chronic illnesses.

2. Study design

The researchers used Colaizzi's phenomenological method to qualitatively analyze the experience of family caregivers undertaking caregiving for the elderly with chronic illness. The Colaizzi data analysis method is a rigorous and powerful qualitative method used by researchers to discover, understand, describe, and define respondents' experiences and reveal emerging and intertwining themes [15]. This scientific approach guarantees the authenticity of the experiences of the caregivers to comply with scientific standards.

3. Setting and participant

This research involved participants in the work area of Bengkulu City Public Health, Indonesia, and was conducted from July to August 2022. Purposive sampling techniques were used in this qualitative study, and qualitative samples were taken to answer the research objectives. The researcher met the person in charge of the elderly program at the community health center and selected respondents according to the inclusion and exclusion criteria. Home visits had been made to potential respondents who fit the criteria. Also, willing potential respondents had their residences visited for interviews. The study consisted of 12 respondents ($n = 12$). The subjects were caregivers who met specific criteria, including participants were the primary caregivers in families caring for the elderly with a chronic illness that had a total degree of dependence; caregivers understand Indonesian; caregivers and the elderly live in the same house or live nearby; the caregiver is willing to become a participant by giving consent through informed consent; and able to tell their experience as a caregiver who cares for the elderly with chronic illness. All caregivers who met the inclusion criteria and gave consent were participants.

4. Ethical considerations

This research has received ethical approval number 271/UN9.FKM/TU.KKE/2022 from the faculty of public health Sriwijaya university. Participants gave their written consent to participate, evidenced by signing the informed consent. Before the interview, the participants were informed that participation in the interview was voluntary and that they could resign at any time.

5. Data collection

The first author (NY) conducted face to face in-depth interviews with 12 respondents to facilitate caregivers in expressing their experiences. The interviews were conducted using topic guidelines and audio recorded in Indonesian. An interview guideline (Table 1) was adopted from The Zarit Burden Interview and panel discussions among the researchers including a

Table 1. Interview question guidelines

Interview Questions
- Please tell me about the current state of health of the elderly.
- According to you, how much is the dependency of the elderly? Please explain!
- What is your state of health since caring for the elderly?
- Do you feel still capable of caregiving for your own elderly, or will you leave the responsibility to the other sibling? Explain why!
- How do you feel while undertaking caregiving for the elderly? Are there feelings of stress, anger, fear, tension/discomfort? Can you explain?
- Do you feel a loss of self-control while caring for/dealing with elderly illnesses?
- Are you unsure about the care you have given the elderly?
- What is your hope for the elderly? Is there a feeling of wanting to do anything for the health of the elderly?
- Let's talk about whether, since caring for the elderly, you feel that you do not have time to do other activities, such as free time for yourself, other families or friends?
- Is there a feeling of shame and discomfort in making friends with others because there is an older person who is sick?
- Can you explain, does taking care of the elderly interfere with relationships with other families?
- How is the economic condition of your family since caring for the sick elderly? Is there an elderly's need that requires additional funds?

principal investigator (with expertise in qualitative research methods and community nursing) [16].

The first (NY) and second (TA) authors inspected and refined the question and organized them into a logical flow from a broad to specific focus. During the interviews, several questions were modified or added to clarify important content arising in the earlier interviews. The interviews were undertaken primarily at the caregiver's home, but some wanted to be at their workplace for approximately 90 - 120 minutes per interview. Data collection ceased once data saturation was reached and no new themes were emerging from the interviews. In-depth questions were also applied to obtain richer data and begin with preliminary questions that include initials, age, education, occupation, income, relationship with the sick elderly, period of caregiving for the sick elderly, chronic illness suffered by the elderly, and the age of the elderly then followed by the main question, as described in Table 2 below.

6. Data Analysis

The audio recordings were transcribed verbatim by the first (NY) and second (TA) authors. Two researchers (TAU and MM) were checked for the accuracy of the transcripts and then stored in the computer software program NVivo 12 (QRS International Pty.Ltd). Thematic analysis was carried out using the Colaizzi method [17]. Within 24 hours of each interview, the tape was transcribed and analyzed by Colaizzi's method of phenomenological analysis. To ensure that optimal analytical rigour was practised, the data were analysed and coded independently by researchers (TAU and MM), any discrepancies were resolved through a consensus discussion with a third researcher (NY). NVivo 12 was used to organise the analytical process, particularly to facilitate the tagging of text segments and groupings of code labels. Reliability was checked by examining response and content consistency across the interviews. Themes were checked by three researchers (NY, TAU, MM) to reduce investigator bias.

7. Trustworthiness

The four aspects of trustworthiness in qualitative research, credibility, transferability, dependability and confirmability [18] have been recognized and utilized in this study. Data were collected in the form of interviews, audio recording and confirmation of findings were confirmed with member checking throughout the interview. Field notes were taken to reveal any biases, and audio recordings were transcribed verbatim in addition to performing an inter-rater reliability analysis. We used intercoder reliability (ICR) to measure of the agreement between different coders (TAU and MM) regarding how the same data should be coded [19]. Cohen's kappa formula used to calculate the agreement among coders [20]. Similar to correlation coefficients, it can range from − 1 to +1. Of the 12 transcripts, 14 major codes were selected for ICR assessment. The overall kappa coefficient for all 14 codes was 0.67.

Results

1. Characteristics of the Participants

Twelve caregivers agreed to share their experiences caring for the elderly with chronic illness. The characteristics of the participants are described in Table 2.

Table 2. Participant's demographic data (*N*=12)

Elderly age (years)	Gender of the elderly	Diseases suffered by the elderly	Period of the illness	Caregivers' age (years)	Caregivers' education	Caregivers' work	Relationship with the elderly
66	F	Stroke, paralysis from the waist down	5 years 9 months	68	Undergraduate	Retiree	Husband
80	F	Osteoporosis	3 years 6 months	88	Senior Secondary	Retiree	Husband
87	F	Hypertension, paralysis	6 years	52	Senior Secondary	Housewife	Biological children
78	F	DM, stroke	6 months (lying down), 12 years sick	37	Senior Secondary	Entrepreneur	Biological children
69	F	Hypertension, stroke	5 years	32	Undergraduate	Self-employed	Biological children
60	F	Stroke	6 years	32	Senior Secondary	Housewife	Biological children
90	M	Stroke	3 years, 1-year total care	32	Undergraduate	Housewife	Daughter-in-law
66	M	Stroke	3 years	63	Elementary	Housewife	Wife
83	F	Heart disease	4 years	56	Diploma	Civil servant	Biological children
80	F	Stroke	3 years	42	Undergraduate	Civil servant	Biological children
62	F	CKD, DM	6 years, lying 4 months	32	Undergraduate	Housewife	Biological children
78	F	Stroke	6 years	46	Senior Secondary	-	Biological children

M = Male, F = Female.

2. Theme

The interview analysis contained four themes: The physical burden of caregivers in the care of the elderly with chronic illness; The psychological burden of caregivers in the care of the elderly with chronic illness; Obstacles of the caregivers in the care of the elderly with chronic illness; The state of caregivers who carry out the care of the elderly with chronic illness. Excerpts related to these themes are attributed to participants in parentheses in the text below. Dots in quotes indicate pauses. In Table 3, examples of categories, codes, and all categories for one of the themes are displayed.

Table 3. Themes and Categories

Theme	Category
Caregiver Physical Burden in Caring for Elderly with Chronic Illness	- Activity Disturbances - Elderly Care - Elderly Dependence - Disease History - Fatigue
The psychological burden of caregivers in caring for elderly people with chronic diseases	- Psychological Burden - Caregivers Hope
Barriers of caregivers in caring for elderly people with chronic illnesses	- Economic Barriers - Help Needed - Lack of Family Involvement - Time Constraint
The condition of caregivers who care for elderly people with chronic diseases	- The caregiver's economic situation - Roles and activities - Caregiver Perceptions

2.1 Theme 1: Physical burden of caregivers in undertaking caregiving for the elderly with chronic illness

The theme of "Physical Burden" relates to all the limitations experienced by the elderly that affect the physical aspects of caregivers. Physical disturbances are intended in the form of social activity disturbances such as activities in the work environment and home environment, rest disturbances and fatigue, and other activity disturbances such as vacations, me time, and work disturbances.

> *" I can't go to the community anymore. In the past I could join community activities, or visit other families. But now, I can't... who's waiting for mom when I go?"* (P1)
>
> *"I sometimes complain because I feel tired, taking care of my mother's defecation and urination"* (P5)

In addition, this theme also explains the various dependencies of the elderly, from partial to total, the occurrence of immobility, the duration of dependency, and the inability and non-participation of the elderly in the decision-making process, so that the needs for daily living activities require assistance from caregivers, which of course becomes a burden for the caregiver. The existence of cognitive and physiological decline is unique and different from that of patients with other chronic diseases. The condition of decline in the elderly is actually a physiological condition that naturally occurs, such as decreased memory, decreased communication skills, emotional changes, and other changes that make elderly caregivers experience their own difficulties in dealing with patients.

> *" Anxious, often unclear what he says, sometimes unclear meaning, sometimes remember he is still young his children are still small like that, more to the past again" (P7)*

This theme also discusses elderly care, which usually requires many things to support daily living activities such as mobility assistance, oxygen assistance, elimination, routine medication, bathing assistance, as well as various treatment efforts, which of course are pursued by caregivers in maximizing the care process. The physical burden felt by caregivers has been summarized in this theme, showing that in caring for elderly people with chronic illnesses, aspects of the physical burden on caregivers must also be considered and minimized, considering that the physical burden expressed affects all aspects of life for individuals.

2.2 Theme 2: The psychological burden of caregivers in undertaking caregiving for the elderly with chronic illness

The theme of the psychological burden felt by caregivers in caring for elderly people with chronic illnesses summarizes various caregiver perspectives regarding feelings related to the emotional aspects felt by caregivers. The psychological burden includes feelings of anxiety, anger at the circumstances and situations that force the caregiver to care for the elderly with an uncooperative attitude, and fear of death of the elderly.

> *" No stress because I have to take care of my mother, but sometimes angry words appear because I'm tired when I drop, others don't care even though there are many children. Sometimes I often blame the mother's condition but don't want to treat it" (P12)*

Various hopes were also expressed, including the caregiver's desire to provide the best support and care and hopes related to the recovery of the elderly, but some respondents had also surrendered to fate. For them, recovery is not always a happy ending, but if indeed death is the best thing for the patient, then they have accepted that as the best decision and are willing to do whatever is best so that the elderly can die in good condition.

> *" I don't know what it's like, the important thing is I've taken care of it. I have treated it, I have been given medicine, I have been to the hospital, where do I take the treatment. So far, not much has changed." (P3)*

2.3 Theme 3: Obstacle of caregivers in undertaking caregiving for the elderly with chronic illness

Various things expressed by respondents as caregivers became obstacles in the process of caring for elderly people with chronic diseases. The first obstacle relates to the help needed by caregivers, but it is rare and very difficult to obtain. This assistance includes care assistance. This occurs because there are no other families, other families are busy, and other families are unable to provide care, so caregivers are the only caregivers who are able to provide care. Lack of family support is also a barrier. Families who do not understand will consider the care process trivial, not care about the caregiver's responsibilities in carrying out care, and lack involvement in helping the process of caring for elderly people with chronic illnesses.

> *"But sometimes we still need someone's help, if for example we can't lift it ourselves, right, then our role for treatment is to decide to call someone... in treatment we take them to the hospital" (P7)*

Furthermore, caregivers face challenges in maintaining routine control of elderly people with chronic diseases due to a lack of visits from health workers. Economic barriers and time constraints were also revealed to be the main obstacles in the treatment process, given the role or role activities that caregivers have in carrying out their functions as healthy individuals.

2.4 Theme 4: The state of caregivers who undertake caregiving for the elderly with chronic illness

The fourth theme summarizes the various circumstances of the family caregivers who are the respondents in this study. The caregiver's economic situation varies; caregivers who have enough money will do various things, such as provide care that includes the facilities needed and the recommended routine treatment budget. The second situation relates to the roles and activities of the caregiver to meet the needs of the household as the mother and head of the family, the health condition of the caregiver himself, the management of the time needed to carry out his activities, the prevention of conflicts related to care, and the role of the family caregiver in work that is also important to become a source of daily livelihood. The caregiver's perceptions have been summarized into the reasons expressed for carrying out the treatment, the sincerity of being a family caregiver, adaptive coping, care experience, and the psychological condition of the family caregiver itself.

> *"No, if that's the problem, my husband understands, understands*

> *the consequences if I move here and what the consequences will be, yes, because it was he who told me to come here again at the suggestion of my husband. Because I really understand I'm the oldest child" P6*

Dicussion

This study described the participants' experiences as caregivers for the elderly with chronic illness. The depth and richness of the conversation suggest that caregivers in this study were able to describe the experience of caregiving for the elderly with chronic illness. Interpretation of the interview revealed four themes of participants' descriptions of their experiences.

Family caregivers take care of the elderly with chronic illness [21]. A family caregiver is a person who always accompanies and cares for patients with chronic illness. As for the duties of caregivers, in addition to being a family that helps patients in their daily activities, they also help in terms of reminding patients to routinely go to the hospital, reminding to take medicine regularly, reminding to adhere to the diet that must be followed, and so on [22,23].

In Indonesia, family caregivers most required health information regarding caring for the elderly with chronic illnesses in order to fulfill their roles and maintain their quality of life [24,25]. Unfortunately, many programs in Indonesia, such as POSBINDU and PROLANIS, did not offer family caregivers with learning on caring for patients with chronic illnesses [26].

Caregiver burden is a multidimensional response to negative assessments and stress from caring for sick people [24]. While treating patients, caregivers can experience difficulties due to the burdens that must be borne physical, psychological, social, and financial burdens [25]. Some factors that affect caregivers' burden include age, gender, income, education level, employment status, marital status, family relationships, and family support [26,27].

1. Physical Burden of Caregivers in Undertaking Caregiving for the Elderly with Chronic Illness

Caregivers have a physical burden because they must take care of patients on an ongoing basis, starting from the need for treatment or control and daily needs, such as eating, self-care, supervision, and others [28]. This study found that the physical burden felt by caregivers when caring for the elderly was fatigue, and in accordance with previous studies that stated the physical burden felt by caregivers can influence the caregiver's health condition, including fatigue, sleep disturbances, no appetite, headaches, high blood pressure, and stomach ulcers [29]. Caregivers who are at high risk of having a low quality of life spend more time and energy caring for chronically ill patients [30].

With age, the health of the elderly deteriorates, functional abilities generally decrease, and they become dependent on others in their daily activities [30]. Therefore, caregivers take more responsibility and provide more help. Caregivers are also burdened with various medical services such as primary daily care like cleaning wounds, administering medicines, providing physical therapy, coordinating medical examinations, providing transportation, and assisting with nutritional needs. Caregivers bear a greater responsibility and commitment to providing daily assistance with special care, especially for the elderly with dependence. Caregivers who served the elderly longer than 14 hours reported higher levels of physical burden than those with shorter caregiving hours [30].

In this study, it is initiated that caregivers had difficulty making time to do social activities because of their busy life in caring for the elderly. Previous research stated that the elderly with chronic pain need more attention, where caregivers become more focused on the patient's condition so that they interact less with others and do not participate in social activities [31]. Providing care to the elderly can cause difficulties in finding time to socialize with the community and recreation.

2. Psychological Burden of Caregivers in Undertaking Caregiving for the Elderly with Chronic Illness

The results of this study show that caregivers experience various psychological problems while treating patients. Psychological conditions that affect caregivers' burden are emotional states, including stress, anxiety, and worry about the patient's condition. Previous research suggests that four of ten caregivers felt unable to cope with their anxiety about the patient's condition [31]. In addition, they also experienced fatigue from caring for the patients and even depression [32]. One-third of caregivers experienced sleep deprivation because they felt worried, stressed, and depressed [33].

Psychological disorders in facing problems such as interpersonal problems, role conflicts, stress, and constant anxiety in life, have an impact on the high burden of caregivers. In addition, along with the patient's health problems, caregivers are also required to support the emotionally ill elderly and take responsibility for the activities of their daily lives, which can aggravate their burden. Caregivers with a higher caregiving burden tend to sacrifice their quality of life [34]. Caregivers feel more responsible for caring for the patients, thus experiencing higher stress levels and tension [35].

The emergence of various burdens or problems in treating patients depends on the coping strategies caregivers use in treating patients, and the quality of life of caregivers also affects the emergence of burdens for caregivers [36]. The weight of the burden experienced by the caregiver depends on the coping strategy used by the caregiver. The more positive the coping strategy the caregiver has, the better the caregiver's way of overcoming his problem [36]. Caregivers use various coping strategies during caring for elderly patients, namely with positive emotions such as affection, hope for a better future, getting closer to God, participating in religious activities, helping others who have the same problem, consulting with experts, and accepting the disease suffered by the patient [37]. In this study, most respondents accepted the condition suffered by the patient as a form of coping and drawing closer to God.

3. Obstacles of caregivers in undertaking caregiving for the elderly with chronic illness

The results of this study show that caregivers need assistance in caring for the elderly such as assistance for caregiving, family support, family involvement, and health facilities. Based on previous studies, patients with chronic disorders can reduce their level of dependence on caregivers through self-care and control of the symptoms of their illness [38,39]. In this study, patients with diabetes mellitus were able to do self-care and control the symptoms of their disease by regulating their diet and doing glucose checks every day. In contrast, patients with stroke could not do self-care or control the symptoms of their disease. So that caregivers for stroke patients need help treating clients when transferring patients and installing pampers. This result is the same as previous studies that stated that patients with diabetes had the lowest care load value [40].

The results of this study show that most caregivers did not get families' support and involvement. The caregiver's responsibility for patient care leads to limited caregiver time for family and friends, resulting in tension in the family and friend relationship [33]. Caregivers who have family support and involvement in providing care to the elderly have a higher spirit than respondents who do not get family support. This because caregivers feel that the burden of caring for the elderly is felt by all family members, while caregivers who take care of the elderly alone feel that they have no other choice but to take care of the patient. However, both caregivers with family support and involvement provide maximum care. Previous research suggests that family support and involvement are coping sources for caregivers caring for the elderly with chronic it [40]. Caregivers who have their family, friends or social relationship who provide emotional support to others or their spouses, have better health and are satisfied with their quality of life [41].

In addition to the lack of family support, in this study, it was found that there were caregivers who experienced economic barriers. This is because caregivers only rely on their income to treat patients, but caregivers have their spouses' support to finance patient care. Family caregivers are the backbone for the elderly with chronic illness because they provide most of the care and social support for their loved ones [42]. Families who have family members with chronic illness can affect the family's psychological and emotional functioning, disruption of leisure activities, interpersonal relationship and financial resources, where there will be an increase in the needs and financial burdens in the family [43]. Respondents with sufficient financial support reported better health satisfaction. These findings are consistent with previous literature reporting that financially healthy caregivers have less workload and a better quality of life [30,44].

4. The state of caregivers who carry out caregiving for the elderly with chronic illness

Family caregivers will be faced with the number of hours of caring for patients, shouldering a heavy burden, and physical, psychological, and financial problems, which can also influence their health problems [21,22-46]. Undertaking caregiving for the elderly at home can burden caregivers externally and internally. External burdens can arise from other work that caregivers must do and the behaviour of the elderly who are being cared for. Internal burdens one of them is the physical and psychological burdens or emotions [46]. Caregivers can also play a dual role, and it is possible that they also have other family members who need to be taken care of or may also have a partner who lacks support for caregivers in caring for the elderly. Caregivers find it very helpful if there is a burden sharing in the family. The elderly can get a good quality of life if the family can play an optimal role in their caregiving for the elderly. Together, families must collaborate so that when problems arise for the caregiver can be handled and managed correctly, it has an impact both physically and psychically [47].

The financial condition of caregivers in this study consists of the upper middle and lower middle. Respondents with a stable economic state can choose the best medical care. They can also have access to a wide range of treatment options. In addition, caregiving does not burden their finances, and they have a high sense of accomplishment because it does not burden a person. On the contrary, caregivers with limited financial resources find it difficult to cover patients' medical expenses while at the same time supporting their families. This can jeopardize their quality of life and increase the burden on the caregivers [48]. Health insurance can help alleviate long-term medical expenses, effectively reducing the burden on caregivers and health care costs [29]. Patients seek treatment in two ways: by paying in cash and not paying. Patients who do not pay come from underprivileged communities using the JAMKESMAS, JAMKESDA, or JAMKESKOT CARDS and guarantees from ASKES (for civil servants or retirees) [28].

The results of this study revealed that even though caregivers have physical, psychological, and economic obstacles, they still carry out maximum care for the elderly because the elderly are family members they care about. Respondents also expressed satisfaction with their current health. Previous research suggested that nearly half of caregivers reported being satisfied with their overall health and having a good physical health status [49]. In this study, caregivers did not feel burdened with the patient's disease. However, some caregivers show difficulties in the division of caregiving roles, especially when they have high burdens and family problems, thus developing the guilt of feeling unable to perform the role properly.

The majority of caregivers today reveal that undertaking caregiving for the elderly is their obligation. This finding is in accordance with the existing literature, which states that social norms and responsibilities reflect the general expectation that family members are especially needed by the elderly with chronic illness [49]. Nearly a third of caregivers did not experience adverse health effects due to the role of caregivers. Caregivers often find positive aspects of their experiences while caring for the elderly, although their burden is also constantly increasing. This in line with previous studies that revealed that the caregiving experience gives them purpose and meaning in life, makes them feel good about themselves, allows them to adapt to situations, and strengthens their relationships with others [50,51]. Supporting or helping others in health is as beneficial as receiving help [30].

Limitations of this study

The first limitation of this study is that most of the participants were biological children. This is because in Indonesia, biological children are the dominant family caregivers, whether it be caring for elderly, and whether they are healthy or sick. Based on this biological children-dominant factor in the participants, this study cannot be generalized considering that the experiences of family caregivers caring for sick elderly are not necessarily the same as the experiences of wife or husband caring for sick elderly. The second limitation of this study is that the most respondents were diagnosed with stroke, and therefore this study cannot be generalized considering that the experiences of family caregivers caring for sick elderly with non-communicable disease might be different from the experiences of those caring for elderly with other conditions such as diabetes, pulmonary, kidney and cardiovascular disease. Another limitation is that while caring for chronic illness must be unforgettable and deeply remembered by the family caregivers, the recall bias could be possible with the passage of time since the moment of loss.

Conclusion

The experience of caregivers in undertaking caregiving for the elderly with chronic disease has many obstacles, such as physical, psychological, and economic burdens. However, they still carry out maximum care for the elderly because the elderly are a family member they care about. Caregivers often find positive aspects of their experiences while caregiving for the elderly, although their burden also constantly increases. The caregiving experience for the elderly gives them purpose and meaning in life, makes them feel good about themselves, allows them to adapt to situations, and strengthens their relationships with others. This study expected that health facilities could pay serious attention to family caregivers and facilitate programs that can help reduce the burden on family caregivers. Further research is needed to explore the experiences of family caregiver burden on broader family roles. The study that highlights the caregiving role and patients' quality of life is also needed to investigate whether or not caregiver burden affects them.

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Conflict of interest

The authors declared no conflict of interest.

Funding

Faculty of Mathematics and Natural Science, Bengkulu University (Grant number: 1980/UN30.12/HK/2022).

Authors' contributions

Nova, Yustisia contributed to conceptualization, data curation, data collection, formal analysis, funding acquisition, methodology, project administration, writing - original draft, review & editing, investigation, and resources. Titin, Aprilatutini contributed to data collection, writing- original draft, and data curation. Anggriani, Utama, Tuti contributed to supervision, validation, methodology, formal analysis, and writing-review & editing. Mahmasoni, Masdar contributed to formal analysis, software, and visualization.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

The research was supported by a grant from the Bengkulu University. We would like to express our heartfelt gratitude to all patients who have participated in the study.

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RCPHN
Research in Community and Public Health Nursing

Original Article

pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):96-107
https://doi.org/10.12799/rcphn.2023.00052

The Prediction Model of Body Image Distortion in Korean Adolescent in the Era of COVID-19 Using Decision Tree Analysis

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Purpose: Body image distortion (BID) in adolescents is a crucial problem that causes both abnormal eating habits and unhealthy weight control behaviors. COVID-19 has had a negative impact on adolescents' psychological and behavioral status, and this might influence the onset of BID in adolescents. This study aimed to develop a prediction model for BID in Korean adolescents using decision tree analysis.
Methods: The decision tree analysis was used to develop a prediction model for BID in Korean adolescents using the data of 2021 Korea Youth Risk Behavior Survey Web-based (KYRBS).
Results: In the present study, about one-third of the study subjects (31%, n=6,316) showed BID. The BID rate was higher in females (37.2%, node1) than in males (21.2%, node2). Female students with severe GAD-7 level and smartphone use on the weekend over 12h showed the highest rate of BID (66.9%). As to males, the BID rate was the highest (33.1%) among middle school male students who did strength training once a week or none.
Conclusion: In order to reduce BID, there is a need to develop a customized BID education and management programs.

Keywords: Adolescent; Body image; Decision trees

Introduction

Adolescence is an important period for body image development because of considerable physical and psychological age-related transitions occurring during this time [1]. Body image refers to a multidimensional construct incorporating how we perceive, think, feel, and act towards our bodies and the associated spectrum of health consequences [2]. Due to physical physiological, emotional, cognitive, and social changes, adolescence is more concerned with appearance [3]. Accordingly, adolescents can develop distortions in recognizing body image. Body image distortion (BID) usually refers to the perception of one's body to be fatter than it actually is [4]. Specifically, while female adolescents tend to overestimate their weight, male adolescents tend to underestimate their weight [5]. Therefore, adolescents may pursue ideals of physical attractiveness and perceive themselves be falling short of ideal [6]. A previous in adolescents found that 781.% were dissatisfied with their current body image, even though 50% of the study participants had normal BMI [7].

BID in adolescence is a problem because it causes both abnormal eating habits and unhealthy weight control behaviors [8]. Therefore, the BID in adolescents may play a pivotal role in the progress of pathogenic behaviors such as excessive dieting, exercising, and purging. These behaviors can lead to several serious diseases such as body dysmorphic disorder or eating disorder including anorexia nervosa, and bulimia nervosa [9,10]. In this context, necessary to identify the factors affecting BID that cause these serious physical and mental problems.

Received: January 31, 2023; **Revised:** March 12, 2023; **Accepted:** April 6, 2023

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Previous studies found that BID of adolescents is influenced by socio-demographic or environmental factors including gender, body mass index (BMI), socioeconomic status (SES), and media exposure. Emphasizing the role of print media, television, and Internet trends as sources of promoting unrealistic and so-called ideal images to adolescents, Perloff called for further study of the Internet, social media, and their effects on adolescent body image [11]. In addition, it was found that there was a relationship between BID and emotional status such as anxiety or depression. According to Jackson and Chen, sociocultural factors including pressure or stress from family, peers, and media may prominent effects on a range of BID [12]. In summary, factors such as social, physical, and psychological changes of adolescents aged between 12 and 18 years are related to BID.

Coronavirus disease (COVID-19) caused drastic and sudden changes in the way we organize ourselves as social human beings [13]. Among other things, COVID-19 has disrupted and changed adolescents' lives by social distancing, interrupting of typical school routines [14]. The COVID-19 has had a negative impact on adolescents' psychological and behavioral status. There is evidence about significant increases in rate of depression, anxiety, loneliness, and suicide attempts [15]. Furthermore, the lifestyles of adolescents changed, leading to increased media usage time, sugar intake, and sedentary time [16]. One of the previous studies reported that adolescents significantly increased their average daily smartphone uses. This can increase the likelihood of adolescents' exposure to social media or video over the Internet [17]. These rapid psychological, behavioral, social, and environmental changes caused by COVID-19 can adversely affect the severity of BID in adolescents [18]. However, little is known about the factors that can predict BID in adolescents in the era of COVID-19 [19].

To bridge this gap, the present study aimed to develop a prediction model for BID in Korean adolescents using decision tree analysis, which is a well-known useful statistical method to analyze all interaction effects of multiple variables.

Methods

Study Design

This study was a cross-sectional survey study using the 2021 Korea Youth Risk Behavior Survey Web-based (KYRBS).

Study Participants

The KYRBS is conducted annually by the Ministry of Education and the Korea Centers for Disease Control and Prevention (KCDC). In this study, raw data were used after receiving the official approval for use from the KYRBS website. We used the 17th (2021) KYRBS collected from August 30 to November 11, 2021. The KYRBS was designed to represent middle and high school students nationwide using the stratified sample collection method, and students with a long absence, children with disabilities, and students with literacy disabilities were excluded from the sample. The total number of respondents in the 2021 KYRBS was 54,848. The sample as divided into two groups: the distortion group and the non-distortion group. Among the 21,444 people who perceived themselves to be overweight or obese, 6,316 adolescents who actually had normal or underweight in Body Mass Index (BMI, kg/m^2) were defined as the distortion group. In addition, 14,006 adolescents who actually had normal BMI while recognizing that they were of normal weight were defined as the non-distortion group.

Ethics Statement

This study was performed in line with the guidelines of declaration of Helsinki. In addition, approval was granted by the Institutional Review Board of author's affiliation (IRB No. 1041495-202206-HR-01-01).

Measures

Socio-demographic characteristics

The variables collected in this study included socio-demographic factors of age (years), sex (female or male), residence type (living with family/relatives/alone, dormitory, childcare facility), economic condition (high, medium-high, medium, medium-low, low), changes in economic status due to COVID-19 (strongly agree, agree, disagree, strongly disagree), financial aid (no, yes), academic performance (high, medium-high, medium, medium-low, low), stress level (never, little, some, high), subject health status (very unhealthy, unhealthy, average, healthy, very healthy), subjective body shape perception (normal, fat, very fat), BMI (kg/m^2) (underweight, normal), nationality of father and mother (Korean) (no, yes), education level of father and mother (under middle school, high school, over university), sleeping time, time of using smartphone during weekdays/weekend (minutes).

Emotional status

Emotional status included the variables of anxiety (normal, low, medium, severe), sadness and despair (no, yes), loneliness (no, yes), suicidal thoughts (no, yes), suicide plan (no, yes), suicide attempt (no, yes). Anxiety level was measured using general anxiety disorder-7 (GAD-7) [20].

Health related behaviors

This study included factors related to health-related behaviors, including frequency of breakfast (mean value), frequency of fruit consumption (none, 1-2/week, 3-4/week, 5-6/week, 1/day, 2/day, over 3/day), frequency of soda consumption (none, 1-2/week, 3-4/week, 5-6week, 1/day, over 3/day), frequency of sweet beverage consumption (none, 1-2/week, 3-4/week, 5-6/week, 1/day, 2/day, over 3/day), frequency of fast-food consumption (none, 1-2/week, 3-4/week, 5-6week, 1/day, over 3/day), frequency of water consumption (< 1/day, 1-2cups/day, 3cups/day, 4 cups/day, over 5 cups/day). The variables of days of physical activity over 60 minutes, days of strenuous physical activity, days of strength training, sitting time for studying or non-studying were presented as mean values. For the variables of drinking (no, yes), days of drinking (months) (none, 1-2 days, 3-5 days, 6-9 days, 10-19 days, 20-29 days, daily), amount of drinking (1-2 cups, 3-4 cups, 5-6 cups, 1-2 bottles, over 2 bottles), smoking (no, yes), days of smoking cigarettes (none, 1-2days, 3-5days, 6-9days, 10-19days, 20-29days, daily), amount of smoking cigarettes (< 1, 1, 2-5, 6-9, 10-19, > 20) were also included in this study.

Statistical Methods

Statistical analyses were performed with SPSS (Version 28.0, SPSS Inc., Chicago) for Windows. Frequencies (percentages) and mean (standard deviations, SD) were used to analyze the general characteristics, diet, and physical activity of the study participants. Chi-square tests and independent t-tests were run to compare between two groups. To predict BID, a decision tree method was used. In the field of machine learning, data mining, and medicine, decision tree is an useful and popular way to build prediction models by splitting large data into smaller subgroups progressively [21]. The detailed procedure of decision tree is iterative at each branch of the tree, and the independent factors that show the most significant association with the outcome variable are selected step by step by employing a certain criterion [22,23]. In addition, decision tree analysis has the advantage that the analysts can easily understand the process and that it has higher explanatory power than other statistical methodologies such as regression, artificial neural network, and discriminant analysis [24]. This is because the classification and prediction process is expressed by induction rule in a method similar to tree structure [24]. In this study, we employed Chi-squared Automatic Interaction Detection (CHAID) that can predict both continuous and dichotomous target variables to split the criteria in the decision tree. The CHAID can make a classification tree constructed by repeatedly splitting subsets into over two build nodes, beginning from the entire data set [24]. The stopping rule for maximum tree depth is the value of 3, and the minimum numbers of cases for parent and child nodes are 100 and 50, respectively.

To identify validity of the decision tree, split-sample validation analysis was performed. For split-sample validation, the total sample was divided into training data (70% of total sample) and testing data (30% of total sample). The generalizability of the BID prediction model generated using the training data was compared with the prediction model formed through the test data to confirm generalizability. Generalization of training data can be assumed if there is no difference in risk estimates of the model between training data and testing data [23].

Results

General Characteristics

In this study, the data from a total of 20,322 participants were used. All subjects were divided into two groups according to whether or not they showed BID. Those who did not show BID were included in the non-distortion group (n = 14,006, 68.9%), and those who showed BID were included in the distortion group (n = 6,316, 31.1%). The mean age of all study participants was 15.05 (years old), and over a half of participants is female (n = 12,527, 61.6%). As shown in Table 1, significant differences between two groups were found in the following variables: age ($p < .001$), sex ($p < .001$), residence type ($p = .004$), economic condition ($p < .001$), financial aid ($p < .001$), academic performance ($p < .001$), stress level ($p < .001$), subject health status ($p < .001$), subjective body shape perception ($p < .001$), BMI ($p < .001$), mother nationality ($p = .025$), education level of mother ($p = .009$), sleeping time ($p = .014$), time of using smartphone during weekdays ($p < .001$), and on the weekend ($p < .001$).

Difference of emotional status between distortion and non-distortion groups

For the variable of GAD-7, the distortion group showed a higher rate of medium or high level than non-distortion group ($p < .001$). The distortion group showed higher rate of sadness and despair ($p < .001$), loneliness ($p < .001$), suicidal thought ($p < .001$), suicide plan ($p < .001$), and suicide attempt ($p < .001$) than the non-distortion group (Table 2).

Differences of health related behaviors between distortion and non-distortion groups

We observed a significant difference in the frequency of break-

Table 1. General Characteristics

Characteristics	Categories	Total (n = 20,322)	Body Image Distortion		*p*-value
			Non-distortion group (n = 14,006, 68.92%)	Distortion group (n = 6316, 31.08%)	
		N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD	
Age		15.05 ± 1.73	15.14 ± 1.72	14.84 ± 1.75	< .001
Sex	Male	7,795 (38.4)	6,145 (43.9)	1,650 (26.1)	< .001
	Female	12,527 (61.6)	7,861 (56.1)	4,666 (73.9)	
Residence type	Living with family	19,483 (95.9)	13,383 (95.6)	6,100 (96.6)	.004
	Living with relatives	90 (0.4)	63 (0.4)	27 (0.4)	
	Live alone	86 (0.4)	58 (1.4)	28 (0.4)	
	Dormitory	608 (3.0)	462 (3.3)	146 (2.3)	
	Childcare facility	55 (0.3)	40 (0.3)	15 (0.2)	
Economic condition	High	2,071 (10.2)	1,501 (10.7)	570 (9.0)	< .001
	Medium-high	5,816 (28.6)	4,058 (29.0)	1,758 (27.8)	
	Medium	10,355 (51.0)	7,179 (51.3)	3,176 (50.3)	
	Medium-low	1,745 (8.6)	1,070 (7.6)	675 (10.7)	
	Low	335 (1.6)	198 (1.4)	137 (2.2)	
Changes in economic status due to COVID-19	Strongly agree	1,042 (5.1)	650 (4.6)	392 (6.2)	< .001
	Agree	4,970 (24.5)	3,307 (23.6)	1,663 (26.3)	
	Disagree	8,385 (41.3)	5,770 (41.2)	215 (41.4)	
	Strongly disagree	5,925 (29.2)	4,279 (30.6)	1,646 (26.1)	
Financial aids	No	1,871 (92.1)	12,967 (92.6)	5,746 (91.0)	< .001
	Yes	1,609(7.9)	1,039(7.4)	570(9.0)	
Academic performance	High	2,562 (12.6)	1,838 (13.1)	724 (11.5)	< .001
	Medium-high	5,162 (25.4)	3,616 (25.8)	1,546 (24.5)	
	Medium	6,542 (32.2)	4,653 (33.2)	1,889 (29.9)	
	Medium-low	4,280 (21.1)	2,798 (20.0)	1482 (23.5)	
	Low	1,776 (8.7)	1,101 (7.9)	675 (10.7)	
Stress level	Never	611 (3.0)	498 (3.6)	113 (1.8)	< .001
	Little	3,041 (15.0)	2,305 (16.5)	736 (11.7)	
	Some	8,652 (42.6)	6,159 (44.0)	2,493 (39.5)	
	High	5,788 (28.5)	3,730 (26.6)	2,058 (32.6)	
	Very high	2,230 (11.0)	1,314 (9.4)	916 (14.5)	
Subject health status	Very unhealthy	78 (0.4)	30 (0.2)	48 (0.8)	< .001
	Unhealthy	1,424 (7.0)	834 (6.0)	590 (9.3)	
	Average	5,005 (24.6)	3,010 (21.5)	199 (31.6)	
	Healthy	8,925 (43.9)	6,207 (44.3)	2,718 (43.0)	
	Very Healthy	4,890 (24.1)	3,925 (28.0)	65 (15.3)	
Subjective body shape perception	Normal	14,006 (68.9)	14,406 (100.0)	0 (0.0)	< .001
	Fat	6,146 (30.2)	0 (0.0)	6,146 (97.3)	
	Very Fat	170 (0.8)	0 (0.0)	170 (2.7)	
Body Mass Index(BMI, kg/m^2)	Underweight	205 (1.0)	0 (0.0)	205 (3.2)	
	Normal	20,117 (99.0)	14,006 (100.0)	6,111 (96.8)	< .001
Father nationality (Korean)	No	69 (0.5)	10,257 (99.6)	4,774 (99.4)	.195
	Yes	15,031 (99.5)	42 (0.4)	27 (0.6)	
Education level of father	Under middle school graduates	185 (1.2)	117 (1.1)	68 (1.4)	.217
	High school graduates	3,204 (21.2)	2,173 (21.1)	1,031 (21.5)	
	Over university graduate	8,924 (59.1)	6,133 (59.5)	2,791 (58.1)	
	Don't know	2,787 (18.5)	1,876 (18.2)	911 (19.0)	

(Continued to the next page)

Table 1. Continued

Characteristics	Categories	Total (n = 20,322)	Body Image Distortion		*p*-value
			Non-distortion group (n = 14,006, 68.92%)	Distortion group (n = 6316, 31.08%)	
		N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD	
Mother nationality (Korean)	No	380 (2.5)	10,121 (97.7)	4733 (97.1)	.025
	Yes	14,854 (97.5)	238 (2.3)	142 (2.9)	
Education level of mother	Under middle school graduates	160 (1.1)	95 (0.9)	65 (1.3)	.009
	High school graduates	3,871 (2.4)	2,586 (2.0)	1,285 (26.4)	
	Over university graduate	8,756 (57.5)	6,030 (58.2)	2,726 (55.9)	
	Don't know	2,447 (16.1)	1,648 (15.9)	799 (16.4)	
Sleeping time		6.12 ± 1.43	6.14 ± 1.42	6.08 ± 1.44	.014
Time of using smartphone during weekdays (minutes)		287.25 ± 185.08	279.98 ± 180.73	303.24 ± 193.38	< .001
Time of using smartphone during weekend (minutes)		409.15 ± 237.68	397.83 ± 231.19	434.02 ± 249.57	< .001

Table 2. Emotional status

Characteristics	Categories	Total (n = 20,322)	Body Image Distortion		*p*-value
			Non-distortion group (n = 14,006, 68.92%)	Distortion group (n = 6316, 31.08%)	
		N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD	
General Anxiety Disorder-7 (GAD-7)	Normal	13,022 (64.1)	9,501 (67.8)	3,521 (55.7)	< .001
	Low	4,777 (23.5)	3,032 (21.6)	1,745 (27.6)	
	Medium	1,675 (8.2)	1,022 (7.3)	653 (10.3)	
	Severe	848 (4.2)	451 (3.2)	397 (6.3)	
Sadness & Despair	No	14,737 (72.5)	10,479 (74.8)	4,258 (67.4)	< .001
	Yes	5,585 (27.5)	3,527 (25.2)	2,058 (32.6)	
Loneliness	No		3,131 (22.4)	1,038 (16.4)	< .001
	Yes		10,875 (77.6)	528 (83.6)	
Suicidal thoughts	No	17,717 (87.2)	12,459 (89.0)	5,258 (83.2)	< .001
	Yes	260 (12.8)	1,547 (11.0)	41,058 (16.8)	
Suicide plan	No	19,516 (96.0)	13,524 (96.6)	5,992 (94.9)	< .001
	Yes	806 (4.0)	482 (3.4)	324 (40.2)	
Suicide attempt	No	19,839 (97.6)	13,722 (98.0)	6,117 (96.8)	< .001
	Yes	483 (2.4)	284 (2.0)	199 (3.2)	

fast between the non-distortion (4.75 ± 2.73) and the distortion groups (4.62 ± 2.68) ($p = .001$). In the frequency of fruit and soda consumption variables, both groups showed the highest frequency of 3-4 times a week and 1-2 times in a week, respectively ($p < .001$). For the frequency of fast-food and water consumption variables, both groups showed the highest frequency of 1-2 times in a week and over 5 cups in a day, respectively ($p < .001$). For the physical activity parts, two groups showed significant differences in the variables of days of physical activity over 60 minutes ($p < .001$), strenuous physical activity ($p < .001$), strength training ($p < .001$). In addition, the distortion group showed a significantly higher time of sitting time for non-studying (162.84 ± 2.07) than differences in variables of sitting time for non-studying (151.24 ± 1.29) ($p < .001$). In addition, there were significant differences in variables of drinking ($p = .004$), amount of drinking ($p = .036$), smoking ($p = .002$) (Table 3).

Prediction model for body image distortion

The prediction model with 20 nodes of this study is shown in Figure 1. As can be seen in the classification tree, about 31.1%

Table 3. Health related behaviors

Characteristics	Categories	Total (n = 20,322)	Body Image Distortion		*p*-value
			Non-distortion group (n = 14,006, 68.92%)	Distortion group (n = 6316, 31.08%)	
		N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD	
Frequency of breakfast		4.71 ± 2.72	4.75 ± 2.73	4.62 ± 2.68	.001
Frequency of fruit consumption	None	2,318 (11.4)	1,551 (11.1)	767 (12.1)	< .001
	1-2/week	6,510 (32.0)	4,420 (31.6)	2,090 (33.1)	
	3-4/week	5,710 (28.1)	3,915 (28.0)	1,795 (28.4)	
	5-6/week	2,109 (10.4)	1,483 (10.6)	626 (9.9)	
	1/day	2,235 (11.0)	1,615 (11.5)	620 (9.8)	
	2/day	961 (4.7)	684 (4.9)	277 (4.4)	
	Over 3/day	479 (2.4)	338 (2.4)	141 (29.4)	
Frequency of soda consumption	None	5,297 (26.1)	3,542 (25.3)	1,755 (27.8)	< .001
	1-2/week	8,694 (42.8)	6,027 (43.0)	2,667 (42.2)	
	3-4/week	4,065 (20.0)	2,820 (20.1)	1,245 (19.7)0	
	5-6/week	1,130 (5.6)	823 (5.9)	307 (4.9)	
	1/day	639 (3.1)	468 (3.3)	171 (2.7)	
	2/day	269 (1.3)	117 (1.3)	90 (1.4)	
	Over 3/day	228 (1.1)	147 (1.0)	81 (1.3)	
Frequency of sweet beverage consumption	None	3,200 (15.7)	2,179 (15.6)	1,021 (16.2)	.126
	1-2/week	7,650 (37.6)	5,298 (37.8)	2,352 (37.2)	
	3-4/week	5,431 (26.7)	3,711 (26.5)	1,720 (27.2)	
	5-6/week	2,026 (10.0)	1,395 (10.0)	631 (10.0)	
	1/day	1,265 (6.2)	915 (6.5)	350 (5.5)	
	2/day	438 (2.2)	300 (2.1)	138 (2.2)	
	Over 3/day	312 (1.5)	208 (1.5)	104 (1.6)	
Frequency of fast-food consumption	None	3,495 (17.2)	2,385 (17.0)	1,110 (17.6)	.016
	1-2/week	11,841 (58.3)	8,239 (58.8)	3,602 (57.0)	
	3-4/week	3,985 (19.6)	2,720 (19.4)	1,265 (20.0)	
	5-6/week	672 (3.3)	459 (3.3)	213 (3.4)	
	1/day	224 (1.1)	136 (1.0)	88 (1.4)	
	2/day	56 (0.3)	40 (0.3)	16 (0.3)	
	Over 3/day	49 (0.2)	27 (0.2)	22 (0.3)	
Frequency of water consumption	< 1/day	799 (3.9)	514 (3.7)	285 (4.5)	< .001
	1-2cups/day	3,903 (19.2)	2,633 (18.8)	1,270 (20.1)	
	3 cups/day	4,823 (23.7)	3,318 (23.7)	1,505 (23.8)	
	4 cups/day	3,654 (18.0)	2,480 (17.7)	1,174 (18.6)	
	Over 5 cups/day	7,143 (35.1)	5,061 (36.1)	2,082 (33.0)	
Days physical activity over 60 minutes		2.99 ± 2.09	3.12 ± 2.15	2.72 ± 1.91	.001
Days strenuous physical activity		2.75 ± 1.74	2.86 ± 1.78	2.50 ± 1.60	< .001
Days of strength training		2.25 ± 1.71	2.40 ± 1.80	1.91 ± 1.44	< .001
Sitting time for studying		464.86 ± 234.16	462.72 ± 234.45	469.63 ± 233.46	.054
Sitting time for non-studying		206.10 ± 155.03	151.24 ± 1.29	162.84 ± 2.07	< .001
Drinking	No	13,980 (68.8)	9,548 (68.2)	4,432 (70.2)	.004
	Yes	6,342 (31.2)	4,458 (31.8)	1,884 (29.8)	

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Table 3. Continued

Characteristics	Categories	Total (n = 20,322)	Body Image Distortion		*p*-value
			Non-distortion group (n = 14,006, 68.92%)	Distortion group (n = 6316, 31.08%)	
		N (%) or M ± SD	N (%) or M ± SD	N (%) or M ± SD	
Days of drinking	None	4,342 (68.5)	3,042 (68.2)	1,300 (69.0)	.608
	1-2 days	1,255 (19.8)	886 (19.9)	369 (19.6)	
	3-5 days	351 (5.5)	248 (5.6)	103 (5.5)	
	6-9 days	201 (3.2)	146 (3.3)	55 (2.9)	
	10-19 days	119 (1.9)	87 (2.0)	32 (1.7)	
	20-29 days	57 (0.9)	35 (0.8)	22 (1.2)	
	Daily	17 (0.3)	14 (0.3)	3 (0.2)	
Amount of drinking	1-2cups	906 (45.3)	622 (43.9)	284 (48.6)	.036
	3-4cups	351 (17.5)	241 (17.0)	110 (18.8)	
	5-6cups	177 (8.9)	131 (9.3)	46 (7.9)	
	1-2bottles	392 (19.6)	284 (20.1)	108 (18.5)	
	Over 2 bottles	174 (8.7)	138 (9.7)	36 (6.2)	
Smoking	No	18,568 (91.4)	12,739 (91.0)	5,829 (92.3)	.002
	Yes	1,754 (8.6)	1,267 (9.0)	487 (7.7)	
Days of smoking cigarettes	None	973 (55.5)	698 (55.1)	275 (56.5)	.109
	1-2 days	147 (8.4)	107 (8.4)	40 (8.2)	
	3-5 days	74 (4.2)	53 (4.2)	21 (4.3)	
	6-9 days	49 (2.8)	32 (2.5)	17 (3.)	
	10-19 days	73 (4.2)	47 (3.7)	26 (5.3)	
	20-29 days	71 (4.0)	46 (3.6)	25 (5.1)	
	Daily	367 (20.9)	284 (22.4)	83 (17.0)	
Amount of smoking cigarettes	< 1	131 (16.8)	88 (15.5)	43 (20.3)	.403
	1	61 (7.8)	45 (7.9)	16 (7.5)	
	44,962	275 (35.2)	196 (34.4)	79 (37.3)	
	45,086	252 (19.5)	117 (20.6)	35 (16.5)	
	45,218	117 (15.0)	87 (15.3)	30 (14.2)	
	> 20	45 (5.8)	36 (6.3)	9 (4.2)	

showed BID. The variable of sex was the primary factor predicting BID in adolescents (chi-square = 580.00, $p < .001$). The rate of BID was 37.2% in females (node1), and 21.2% in males (node 2). The rate of BID in female differed according to GAD-7 (chi-square = 150.00, $p < .001$). Of female students with a severe group in GAD-7 (node 3), 51.5% showed BID, while 33.1% in the normal group for GAD-7 (node 4) showed BID. The rate of BID among those in the severe GAD-7 group was different according to time of using smartphone during weekend (chi-square = 14.28, $p = .003$). The rate of BID of females in severe GAD-7 group with over 720 minutes (12h) using a smartphone on weekend (node 8) was 66.9%, which was the highest rate.

The rate of BID in male students differed according to level of school (chi-square = 209.00, $p < .001$). The rate of BID among male students in middle school was 26.6% (node 6), while that among students in high school was 12.9% (node 7). The rate of BID among those in middle school differed according to the number of days of strength training (chi-square = 97.59, $p < .001$). The rate of BID among middle school male students with strength training none or once a week was 33.1% (node 15). The rate of BID of high school male students with no strength training in a week was 18.9% (node 18).

Validity testing of the prediction model for body image distortion

In order to verify generalization of the prediction model for BID, validity testing for training data was conducted. The validity testing of training data through testing data indicated that the risk

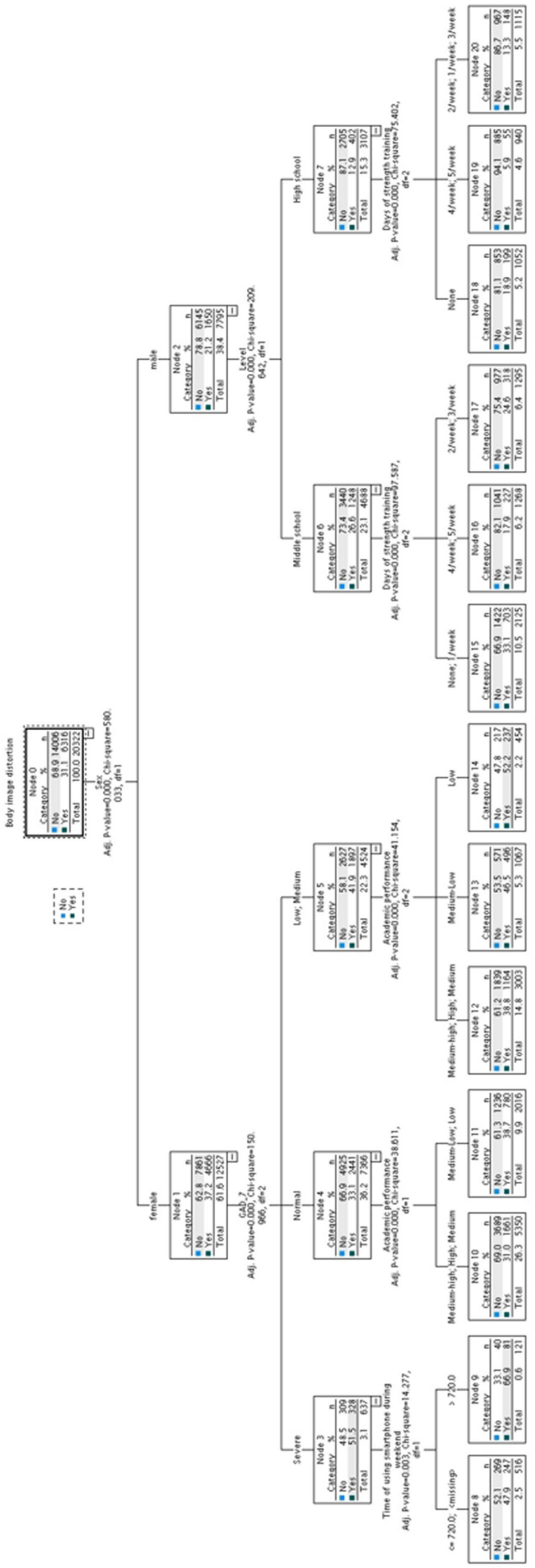

Figure 1. Decision tree of body image distortion by chi-square automatic interaction detection algorithm.

estimate of testing sample was .31, and it was not significantly different from the risk estimate (.31) of the training data. As can be seen in the risk chart, the value of risk estimate was identified to be .31 in the training data, and the classification accuracy can be confirmed to be about 68.7%. Therefore, can be assumed that the prediction model for the BID prediction model generated in the present study has a high generalizability (Table 4).

Discussion

This study was conducted to predict BID among adolescents using the decision tree analysis. The results revealed that about one-third of the study participants (31%, n = 6,316) showed BID. Similarly, a previous study conducted with 2,117 adolescent found almost 50% showed BID [25]. Furthermore, a study conducted on domestic adolescents found that only 58.8% of male students and 64.1% of female students accurately recognized their actual body shape [26]. However, in a study conducted among 9,714 normal weight American students, the rate of BID was 16.2% [27]. Comparing these outcomes with the results of the present study, it was confirmed that the BID ratio of the results of this study was quite high. Despite some differences between previously reported results and those reported in the present study, we can conclude that BID in adolescence is a serious problem that cannot be overlooked.

From the decision tree, the variable of sex was found to be the primary factor predicting BID in adolescents. The BID rate was higher in female (37.2%, node1) than male (21.2%, node2) study participants. This result is consistent with studies conducted prior to COVID-19 [28-30]. In specific, a study reported that 50.5% of all students, 39.9% of male students, and 61.4% of female students, showed BID [31]. Although the BID rate is different for each study, it was found that female students showed higher rate of BID than male students regardless of COVID-19. However, a survey found that the most difficulty of students during COVID-19 was physical changes including weight gain, and this was especially noticeable in female students [31]. Based on this result, it can be assumed that BID in female students has become more serious problem due to the COVID-19. However, further studies should be conducted to identify the impact of

Table 4. Risk Chart of Decision Trees

Variables	Risk estimate	SE
Training data	.31	.01
Test data	.31	.01

COVID-19 on sex-specific BID differences.

Although it is not identified in the COVID-19, there are several suggested reasons for higher BID in female students than in male students. A previous study insisted that females tend to harbor a more negative body image easily than men for the reason of high BID in female [30]. Also, it is reported that females are often judged for their appearance against strict and pervasive norms of ideal appearance [28,32]. This situation makes female students feel pressure to achieve a more ideal appearance, which can potentially lead to a negative body image of them [32]. In addition, a previous study suggested that there is a social culture that discriminates based on female appearance [33]. Another study stated that female students more sensitively responded to other or social evaluations than to their won subjective evaluations of their body image, so BID appeared at a higher rate among female rather than among male students [34]. Of note, females with a low BMI may experience complications such as amenorrhea, infertility, and low birth weight. In particular, it can be worse during COVID-19, more attention should be paid to the distortion of the body image of normal or underweight female students.

In this study, females showing severe GAD-7 level and using smartphone on weekend over 12h showed the highest rate of BID. This result is largely consistent with the results of a previous study that found a significant relationship between time of using smartphone and BID. The authors also found that anxiety related to BID and smartphone dependence [35]. In addition, the results of this study are consistent with the results of a study that reported that anxiety plays a mediating role in BID and smartphone use [36]. During COVID-19 pandemic, female students considered that body weight gain, increased media use time, and stress as the biggest difficulties [37]. As the use of smartphones increased due to COVID-19 dramatically [38], physical activity decreased and weight increased, but as exposure time to media increased, anxiety due to stress increased, making BID more serious. In order to reduce the BID rate in female students, it is necessary to develop relevant management and prevention programs that consider the anxiety level and time of smartphone use. Due to the COVID-19, there is a possibility that female students' anxiety and smartphone use have increased, which may have adversely affected changes in their BID. Therefore, continuous counseling and observation are also necessary.

The rate of BID among middle school male students with strength training none or once a week was 33.1% (node 15). However, contrary to our findings, a previous study—although it included participants of both genders—found that the rate of BID was higher among high school students than among middle school students [25]. A previous study found that appropriate physical activity in adolescence helps to reduce depression, stress, and suicidal thoughts along with positive effects on growth and development [39]. Since male students tend to be more physically active than female students, it can be assumed that the lack of strength training affected the high rate of BID in male students. Actually, it was difficult to compare these results with previous studies due to the lack of research about male students' BID. Yet, since interest in the body image has surged among male students, further research on this topic is needed. Poor body image can adversely affect physical and psychological health and influence self-esteem, mood, competence, as well as social and occupational functioning [40]. Therefore, further research on BID among adolescents would be needed to set the healthy body image and to prevent various illness.

Strengths and limitations

To the best of our knowledge, this study is the first to develop a prediction model of body image distortion among adolescents in the COVID-19 pandemic time. Although men's interest in body shape is increasing, previous studies related to appearance and BID have been mainly conducted on female students. However, this study is more meaningful in that it also included male students. Our results can serve as fundamental data for the development of education or management programs that support to form a healthy body image of adolescents. However, there are several limitations that should be considered in further studies. First, this study might not have included all factors related to body image distortion, such as quality of life, depression, relationship of friends, or underlying disease in adolescents. Second, the data used in this study were collected by self-reporting; therefore, the level reliability of data might be somewhat low. Third, this study did not compare the factors related to BID before and after the COVID-19. Forth, since no study has been conducted to identify factors that predict BID in students in the era of COVID-19, it is difficult to compare the differences of factors found in results. For that reason, it is difficult to conclude that the factors identified in this study significantly affect adolescent BID only in the era of COVID-19. Finally, although the data used in this study were collected during the COVID-19, it cannot be assumed that characteristics of the subjects fully reflected the situation of COVID-19.

Conclusion

The results of the present study confirmed that BID has a high prevalence rate among adolescents. The BID is affected by the variable of sex. Female students showed a higher rate of BID than male students. Female students with a severe level of anxiety and using smartphone during weekend over 12 hours showed the highest rate of BDI. The highest rate of BID among male study participants was observed among students attending middle school and those you did not do strength training or did it once a week. From the results of this study, the factors related to BID were not significantly different from those found in studies before COVID-19. However, even for the same factors, smartphone use, anxiety, and physical activity were significantly affected by COVID-19, which is likely to have influenced BID changes. However, since this study is a cross-sectional study that reflects only a temporary situation, in order to generalize to study, it is necessary to conduct the study by expanding the scope of subjects in the era of infectious diseases such as COVID-19 in the future. In addition, a longitudinal study is needed to explore changes in BID reflecting changes in circumstances and to identify factors influencing changes.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Authors' contributions

Han, Myeunghee contributed to conceptualization, data curation, formal analysis, methodology, visualization, writing - original draft, review & editing, investigation, resources, software, supervision, and validation.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

None.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):108-116
https://doi.org/10.12799/rcphn.2022.00150

한국 사업장에서 근무하는 베트남 근로자의 일 적응 경험: 구성주의 근거이론

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Work Adaptation Experience of Vietnamese Workers in Korean Workplaces: Constructivist Grounded Theory

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Purpose: The purpose of this study is to find a nursing intervention plan by classifying the body pain areas of the Korean aged and analyzing related factors.
Methods: This study performed the latent class analysis, cross-analysis, and one-way ANOVA using the SPSS 25.0, M-plus 7.0 program on 4,388 older adults aged 65 or over using the data from the 2020 Aging Research Panel.
Results: As a result of the Latent Class Analysis, participants divided into four groups. Group 1 was the 'shoulder and low back pain group' with high shoulder and back pain, group 2 was the 'upper body pain group' with severe pain in the arms, wrists and fingers and chest, group 3 was the 'lower pain focused group' with high pain in the legs and knees, and finally, group 4 was the 'general low pain group' with low pain overall. The result of the study shows that the group that did not exercise regularly, the female group, and the low socioeconomic status group have more pain in general. The upper body central pain group showed a low level of life satisfaction.
Conclusion: This study discusses various nursing interventions for the prevention of chronic pain, especially for the aged female group who has diverse body pain areas, the aged with low socioeconomic status, and the aged who do not exercise.

Keywords: Transients, Qualitative Research, Grounded Theory, Social Adjustment, Work

서론

1. 연구의 필요성

우리나라 외국인 근로자는 1980년대 후반부터 국내 근로자들이 기피하는 사업장에 노동력을 대체할 목적으로 유입되었다[1]. 정부는 외국인 근로자를 부당한 근로조건으로부터 보호하기 위해 2003년 외국인 근로자 고용 등에 관한 법률을 제정하여 2004년 고용허가제를 도입하였다[2]. 고용허가제로 입국하는 외국인 근로자는 2022년 12월 기준 268,413명으로 그 중 베트남 외국인 근로자의 비율이 약 18%로 중국 국적 다음으로 가장 많은 수를 차지하고 있으며[3], 이들은 타국가 출신 근로자에 비해 온순함과 성실함, 업무수행 속도 등으로 인해 국내 사용자들이 가장 선호하는 것으로 나타났다[4].

고용허가제로 입국하는 근로자의 75%가 작업환경이 위험하고

주요어: 외국인근로자, 질적연구, 근거이론, 사회적 적응, 일
Received: July 8, 2022; **Revised:** April 4, 2023; **Accepted:** April 6, 2023
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열악한 영세사업장에서 단순기능업무에 종사하는 것으로 확인되었다[2]. 이들은 국내 체류기간이나 사업장 변경에 제한이 있으며[5] 내국인과 달리 본인 스스로 직장을 선택할 수 있는 권리가 인정되지 않으며 가족을 동반하지 못하는 것을 원칙으로 한다[2].

외국인 근로자들은 본국과는 다른 나라에서 문화적 스트레스와 생소한 업무수행으로 인한 압박감에 시달리며 경험해 보지 못한 일을 단기간에 익혀야 하는 부담감이 높다[6]. 더욱이 이주한 국가의 사업장에 효율적으로 적응하지 못하는 경우 신체적 건강문제[7]와 정신적 문제[8] 뿐만 아니라 조직의 성과에도 부정적인 영향을 미친다[9]. 외국인 근로자들의 산업재해율은 0.87%로 국내 근로자의 0.49%에 비해 2배정도 높았으며, 의사소통의 어려움으로 체계적이고 주기적인 교육을 받지 못하고 문화적 차이로 재해 위험에 노출되는 빈도가 높았다. 또한 베트남 외국인 근로자들은 경제적 어려움과 불법 체류 비율이 타 국적 근로자에 비해 높았으며 적응과정에서도 어려움이 많은 것으로 보고된다[10]. 따라서 외국인 근로자들이 사업장에 건강하게 적응하는 것은 근로자 개인뿐만 아니라 한국의 사업장과 우리 사회에서 건강한 구성원으로 자리매김하는데 직결되는 과제라고 볼 수 있다. 기존의 연구들은 출신 국가를 고려하지 않고 외국인 근로자 전체를 접근하였으나 이들의 사회문화적 배경이 달라 국적별로 근로자를 대상으로 연구가 필요할 것이다.

국외 선행연구에서는 외국인 근로자의 직장경험에 관한 연구[11], 이주여성의 일 적응경험[12], 이주노동자의 고용에 대한 질적 연구[13] 등 다수가 있다. 그러나 이들 연구 결과는 그 맥락적 배경이 우리 사회와는 달라 그대로 적용하는 데는 제한이 있을 것이다.

국내 선행연구를 살펴보면, 이주 남성 근로자들의 체험에 관한 연구[14]와 이주노동자의 삶의 생애사적 연구[15], 한국 사회 적응에 관한 연구[16]가 있다. 그러나 이들 연구는 대부분 사업장과 한국 사회에서 경험한 차별, 편견, 인권과 문화 부적응 등에 중점을 두고 있어, 외국인 근로자들이 한국의 사업장에서 하는 일에 어떻게 적응해 나가는지를 파악하기에는 제한이 있다. 따라서 외국인 근로자들이 한국의 사업장에서 일과 관련하여 무엇을 경험하는지 또 시간이 지나면서 어떻게 변화하는지를 통합적으로 이해할 수 있는 연구가 필요하다.

따라서 본 연구는 고정된 틀이 없는 유연함과 열린 결말을 가진 상호작용적 과정과 해석학적으로 편안함을 가진 Charmaz [17,18]의 구성주의 근거이론방법을 적용하여 베트남 근로자들이 한국의 사업장에서의 일 적응 경험을 생생하게 탐색하기 위하여 시도되었다. 이러한 연구를 바탕으로 외국인 근로자들을 고용하고 있는 사업장의 사업주와 보건관리자는 이들의 사업장 업무적응과 안전보건과 같은 작업환경 개선대책을 마련하고 건강을 보호할 수 있도록 노력해야 한다. 따라서 추후 외국인 근로자들의 산업보건정책 수립 시 근거자료가 될 것이다.

2. 연구 목적

본 연구의 목적은 베트남 외국인 근로자들이 한국 사업장에서 일을 어떻게 적응해 가는지를 구성주의적 접근으로 파악하기 위함이다.

연구방법

1. 연구 설계

본 연구는 베트남 외국인 근로자들이 한국 사업장에서 일을 어떻게 적응해 가는지를 구성주의 접근으로 파악하기 위한 질적 연구이다.

2. 연구 참여자

본 연구의 참여자는 B광역시와 인근 중소도시에 거주하고 있는 자로 50인 미만의 소규모 제조업 사업장에서 근무하는 베트남 국적의 합법 체류 남성 근로자이다. 외국인 근로자들이 국적별로 다양한 특성을 가지고 있어 구체적으로 이해하기에 한계가 있어 베트남 외국인 근로자로 선정하였으며, 한국어로 의사소통에 어려움이 없으며 본 연구의 목적과 방법에 대한 설명을 듣고 자의로 면담 참여에 서면으로 동의한 자로 거주기간이 최소 1년 이상에서 최대 4년 10개월 미만인 자이다. 이는 최소 1년 이상이 경과해야 업무적응과 한국어를 구사할 수 있을 것이라 판단하였기 때문이다[19]. 연구 참여자 모집을 위해 연구자는 B광역시 소재의 종교기관에서 운영하는 외국인 근로자센터를 직접 방문하여 기관장에게 연구의 취지를 설명한 후 기관장으로부터 참여자 선정요건에 부합한 자를 소개받아 연구 참여에 동의하는 자와 기참여자로부터 소개받은 자를 대상으로 하였다. 참여자의 변이를 고려하여 연령, 교육 년수, 체류 기간, 이직 횟수, 직장에서의 위치 등 다양하게 참여자들을 선정하였다. 분석이 진행되면서 교회나 외국인지원센터 등을 적극적으로 활용하는 자와 한국어 실력이 높은 자들이 일에 원활하게 적응하는 것으로 보여 그렇지 않은 사람을 의도적으로 포함시켰으며, 16번째 참여자와의 면담에서는 새로운 범주의 속성이 나타나지 않아 자료수집을 종료하였다.

3. 자료수집과정

자료수집은 2018년 9월부터 2019년 3월까지 참여자와의 면대면으로 개인면담을 하였다. 면담시에는 참여자들과의 원활한 면담을 위해 한국어와 베트남어에 능통한 통역자를 동반하였으며, 참여자가 외국인이라 상황에 맞지 않는 단어를 구사할 때에는 통역자를 통해 자국의 언어로 질문하여 단어의 뜻을 재확인하였다. 면담을 통해 풍부한 자료를 얻기 위해 노력하였으며, 면담과정에서 그들만의 언어를 이해하려고 하였다. 면담 횟수는 1회에서 최대 4회로 총 33회, 시간은 약 60분에서 180분가량 소요되었다. 장소와 시간은 참여자가 직접 결정하도록 하였으며, 종교기관에서 운영하는 상담실이나 참여자가 원하는 조용한 카페에서 실시하였다.

면담 진행은 일상적인 대화를 시작으로 라포를 형성하였고 서서히 본 연구를 위한 개인면담을 하였다. 면담하는 동안 참여자의 말을 섣불리 차단하거나 판단하지 않고 억지로 정보를 얻어내기보다는 평온한 상태에서 이야기가 나오도록 경청하려고 노력하였다. 면담 시에는 '한국 사업장에서 일하시면서 경험하신 것을 이야기해 주시겠습니까?'를 주질문으로 하였다. 그러나 상황에 따라 '한국에서 일하시게 된 계기를 이야기해 주시겠습니까?', '한국 사업장에서 어떻게 일을 익혀 나갔습니까?', '일하시면서 보람이나 힘든 점을 이야기해 주시겠습니까?', '한국에서의 일이 귀하에게 주는 의미는 무엇입니까?' 등의 질문을 하였다.

연구자는 개인면담이 이루어지는 동안 연구 참여자의 동의를 얻어 모든 대화 내용을 녹음하였으며 면담이 끝난 당일 녹음자료를 참여자가 표현한 언어 그대로 필사하였다. 원자료의 정확성을 위해 녹취록을 여러 번 반복해서 들으면서 필사와 현장 노트를 정리하면서 기억의 손실을 최대한 방지하였다. 면담하는 동안 참여자의 비언어적 태도와 분위기, 연구자가 느낌 등의 내용을 분석노트에 기록하였다.

4. 자료 분석

본 연구에서 자료 분석은 자료수집과 동시에 이루어졌으며, Charmaz [17]의 초기코딩, 초점코딩, 범주화 과정으로 진행하였다. 분석과정에서 지속적인 비교분석과 이론적 표집을 하였으며, 연구과정 내내 메모를 작성하여 자료수집과 자료 분석에 활용하였다.

초기코딩에서 연구자는 원자료를 수차례 반복해서 읽고 참여자의 경험 의미를 이해하고자 노력하였다. 연구자는 자료 속에 숨어 있는 행위를 찾아내어 코드로 구성하였다. 이때 연구자는 참여자의 경험과정과 행위를 명사나 동명사로 명명하고 가능한 동명사 형태로 명명화하는 작업을 하면서 짧은 코드로 구성하였다. 또한, 연구자는 한줄씩 읽어가면서 기록된 자료의 줄마다 이름을 붙이는 줄코딩(Line-by-Line)을 하였다.

초점코딩에서 연구자는 자료를 코딩한 후 코딩과 자료를 끊임없이 서로 비교하고 자료와 자료를 비교하면서 가장 빈번하게 나타나는 코드와 드물지만, 연구주제를 잘 드러낼 수 있는 코드들을 초점코딩하여 잠정적 범주로 가늠하였다.

범주화는 초점코딩에서 잠정적인 범주로 여겨진 것을 이론적인 형태로 범주화하였다. 초기코딩에서 분해되었던 자료를 재조합하는 과정으로 범주들을 속성과 차원에 따라 하위 범주들과 연결하고 범주의 속성과 차원을 구체화하고 범주와 다른 범주들과 체계적으로 연결하고 범주들을 정련화하는 절차를 거쳤다.

자료수집부터 작성해온 메모를 토대로 참여자마다 맥락과 시간, 관계의 변화에 따라 도형을 이용하였다. 범주와 범주를 연결하고 범주와 하위 범주가 어떻게 연결되는지 확인하면서 수없이 많은 집락과 도면화를 작성하는 절차를 거쳤다. 본 연구자는 하나의 코드에서 집락을 시작한 후 코드 간의 관계를 집락하고 그런 다음 코드와 범주간의 관계를 집락하면서 다른 범주와 잘 연결되는지 비교하면서 배치하고 도면화 하였다. 자료에 적합한 해석 아이디어를 통해 잠정적인 분석 범주를 도출하였으며, 잠정적인 범주에서 최종 범주들을 개발하기 위해서 수없이 많은 집락화와 도면화 절차를 거쳤다.

5. 연구의 엄밀성 확보와 연구자의 준비

본 연구의 질 확보를 위하여 Charmaz [17]가 제시한 신빙성(Credibility), 독창성(Originality), 반향성(Resonance), 유용성(Usefulness)의 기준을 따르고자 노력하였다.

첫째, 신빙성은 연구상황이나 주제에 대해 친밀한 익숙함을 얻어내고, 주장을 뒷받침해 주는 자료는 충분한지, 수집된 자료는 연구자의 주장 및 분석과 논리적으로 강고하게 연결되어 있는가를 말한다. 본 연구의 연구자는 초기 코딩에서 구성한 범주를 중심으로 이야기를 구성하여 신빙성을 충족하였다.

둘째, 독창성은 연구자의 범주가 신선하면서 새로운 통찰을 제공했는지, 분석이 자료에 대해 새롭게 정제된 개념을 제공하는가에 말한다. 외국인 근로자들의 일 적응과정에 대한 연구가 전무한 상태에서 한국 사업장에서 일 적응과정을 추적하고 그에 따른 맥락을 밝혀냈다는 점에서 다른 연구와는 차별성을 갖고자 하였다.

셋째 반향성은 범주가 연구하려는 경험을 충분히 묘사하는지, 연구자의 근거이론은 참여자나 특정 상황을 공유하는 사람들에게 의미를 부여하고 있는지, 연구자의 분석은 그들의 삶과 세계에 보다 깊은 통찰을 제공하고 있는가를 말한다. 연구자는 참여자가 아닌 3명의 베트남 외국인 근로자에게 연구 결과를 보여주어 그들로부터 자신의 경험을 그대로 기술한 결과라는 평가를 받아 연구의 반향성을 높였다.

넷째, 유용성은 연구자의 분석이 또다른 실체적 영역에 관한 후속연구를 불러오는지, 연구자의 결과물이 지식에 기여하는 바가 어느 정도이며 보다 나은 세계를 만드는데 얼마나 기여하는가를 말한다. 본 연구는 외국인 근로자로 하여금 일 적응과정에서 충분히 공유하고 해석할 수 있으며 이 연구를 근거로 하여 차후 외국인 근로자들의 직무 스트레스 도구개발 등 후속연구도 가능하다는 점에서 유용성이 확보되었다.

본 연구자는 상급종합병원 건강검진센터에서 10여년 근무하면서 다양한 국적의 외국인 근로자들을 접하면서 이들이 일터에 적응하기 위해 어려움을 겪는다는 것을 알게 되었다. 연구자는 질적 연구방법 및 근거이론적 연구에 대한 지식과 실무를 익히기 위해 관련 전문서적을 탐독하였으며, 베트남 외국인 근로자들을 대상으로 2편의 조사연구를 수행한 바 있다[5,8]

또한 연구자료에 대하여 친밀한 익숙함을 확보하기 위하여 베트남 외국인 근로자들이 근무하는 고무제조업체와 주물공장을 3차례 방문하였으며 그들이 처한 작업환경과 하는 업무, 타인과의 소통에 대해 관찰하였다. 또한 자료수집 이전에 외국인 근로자 3인을 면담하여 면담기법을 연습하였다.

6. 윤리적 고려

본 연구는 동아대학교 기관생명윤리위원회에서 2018년 5월 31일 연구심의 승인을 받고 수행하였다(2-1040709-AB-N-01-201805-HR-003-02). 연구 참여자의 권리를 보호하기 위하여 연구자는 통역자를 통해 연구의 목적, 방법, 비밀보장과 익명서, 연구 참여의 이익과 불이익, 자발적 참여 등에 대해 베트남어로 충분히 설명한 후 참여자로부터 베트남어로 번역된 참여 동의서를 받았다. 수집된 자료는 연구자가 부여한 코드 번호를 붙여 사용하였으며, 개인정보 보호를 위하여 녹음된 내용과 모든 자료는 연구자가 직접 보관하며 보관 기관이 끝나면 녹음된 전자파일은 영구 삭제토록 할 것임을 알려주었다. 필사 시 연구 참여자의 이름과 그 밖의 개인정보는 기록하지 않았으며, 면담이 끝난 후에 감사의 표시로 소정의 답례품을 전달하였다.

연구결과

본 연구는 베트남 외국인 근로자 16명이 참여하였다. 참여자의 연령은 평균 33.7세로 20대가 6명, 30대가 8명, 40대가 2명으로 26세에서 43세의 분포를 보였다. 결혼 상태는 기혼 9명, 미혼 7명이었고, 교육 정도는 고등학교 졸업 9명, 전문대학 졸업 4명, 대학 졸업이 3명이었다. 한국의 사업장에서 이직을 한 번도 하지 않는 사람이 6명, 1회 5명, 2회가 3명, 3회가 2명이었으며, 근무 기간은 평균 32.7개월이었으며, 도장, 용접과 프레스 등의 제조업 업무에 종사하였다.

본 연구는 Charmaz의 구성주의 근거이론 방법으로 분석하였으며, 초기코딩에서는 원자료를 수차례 읽고 자료 속에 숨어 있는 행위나 의미있는 부분을 명사나 동명사로 줄코딩을 하여 260개의 코드로 구성하였으며, 초점코딩에서는 코드와 코드 간의 관계를 비교하여 유사한 코드끼리 묶어 가장 주제를 잘 드러낼 수 있는 코드를 구성하여 46개의 잠정적 범주를 구성하였다. 범주화에서는 분해되었던 자료를 재조합하고 범주의 속성과 차원을 구체화하고 정련화 과정을 거쳐 최종 4개의 범주를 도출하였다. 베트남 외국인 근로자의 한국 사업장 일 적응 경험은 '낯선 세계와 직면하기', '온몸으로 분투하기', '도약의 발판 구축하기', '새로운 세상에 스며들기'의 4개의 주요 범주이다. 4개의 범주는 시간이 지나면서 또한 새로운 문제를 직면할 때 마다 순차적으로 진행되면서 순환이 된다. 또한, 선범주는 후범주의 결과를 유발하는 배경으로 작용한다. 낯선 세계와 직면하기는 첫번째 나타나는 단계로 근로자들이 한국과 사업장이라는 이질적인 사회와 낯선 환경에서 두려움과 위축감과 같은 정서적 반응을 강하게 보이는 시기이다. 이때 이들은 모국에 있는 가족들의 끊임없는 격려와 한국 사업장에서 모국인의 존재를 확인하면서 두려운 마음을 떨쳐내고 마음을 다잡는다. 다음 단계로 온몸으로 분투하기는 총체적으로 고충을 겪는 가장 힘든 시기로 업무와 한국말을 동시에 해결해야 하는 과제와 분투한다. 이들은 장시간 노동으로 인해 온몸의 고통을 호소하기도 하며 알아들을 수 없는 한국말로 인해 마음이 참담하지만 몸짓으로 따라하면서 일을 배우기 시작한다. 도약의 발판 구축하기는 사업장에서 본격적으로 업무를 혼자 해내며 자신이 하는 업무에 적응하면서 사람들과의 관계에 눈을 돌리는 시기이다. 참여자들은 수차례 실수를 반복하는 시행착오를 경험하고 한국인 상사에게 지원을 받으면서 이제는 스스로 일을 해낸다. 마지막 단계인 새로운 세상에 스며들기는 한국말과 업무를 꾸준히 갈고 닦아 자신의 일터에서 전문가가 되며 타국 근로자와 관계를 구축하고, 사업장뿐만 아니라 한국 사회와 미래에 자리를 잡아가는 시기이다. 참여자들은 한국어자격증과 업무 관련 자격증을 취득하면서 회사에 능력을 인정을 받고 미래를 위한 새로운 도전을 계획한다. 이 모든 단계에서 참여자 개인의 역량과 동질집단인 가족, 모국친구의 조력과 더불어 한국 사업장의 실제적인 도움에 영향을 받는다.

1. 낯선 세계와 직면하기

참여자들이 한국에 입국하여 근로계약을 체결한 사업장 환경을 처음 접하는 시기까지의 경험에 대한 것으로 참여자들은 모국과 다른 이질 사회와 마주하면서 강한 위축감을 드러낸다. 이러한 위축감은 '낯선 한국환경', '생소한 작업환경과 당황스러운 소통방식'과 '혼자라는 두려움'과 관련이 있다. 참여자들은 낯선 나라의 외관이나 기후와 같은 물리적 환경에 압도되어 주눅이 든다. 작업장에 들어서자 처음 보는 수많은 기계와 굉음에 몸과 마음이 움츠러들면서 기계 앞에 다가서기가 두렵다. 알아듣지 못하는 한국말과 작업장에서의 소통방식에 당혹스럽다. 쉼 없이 일하고 있는 자신에게 더 빨리빨리 하라고 재촉하는 한국인 상사의 큰 목소리에 마음이 다급해진다. 이러한 이질적인 상황은 참여자들을 위축하게 만들며, 더욱이 힘들 때 당장 달려올 가족도 없이 낯선 곳에서 오롯이 견뎌야 한다는 생각에 두렵다. 본국과 다른 타국에서 아는 사람 한 명 없이 혼자라는 사실은 위축감을 가중시킨다.

그럼에도 불구하고 참여자들은 모국에 있는 가족과의 소통과 응원, 사업장에서 모국인의 존재를 확인하면서 안도감을 느끼며, 입국 전 모국에서 수집하였던 한국관련 정보가 위축된 마음을 완화시킨다. 참여자들은 모국에서 인터넷을 통해 한국생활과 한국문화를 미리 접하며 다양한 방법으로 한국이라는 나라에 대해 알아가고자 노력하였다. 이질스런 나라에서 동질집단인 모국의 가족과 만나거나 자신을 마중 나온 한국인 상사를 통해 회사내 모국 사람이 있다는 소식에 온몸에 긴장이 풀리며 회사 상사 옆에 서 있는 모국 사람을 보는 순간 두려움이 사라진다. 또한, 참여자들은 힘들어 매순간 포기하고 싶은 마음이지만 가족들을 생각하면서 힘을 내기도 하며, 모국인의 존재를 확인하면서 두려움을 이겨내고 마음을 다잡기 시작한다.

"회사가 크고 기계가 만아. 츠엄에는 기계 보고 만이 무서버서요. 나는 이런 기계를 츠엄 바서요. 기계를 모라서 무서버서요. 사장님

빠리빠리 일하라고....”(참여자 10)

“차장님 차 타고 회사에 와서요. 차장님 차타고 오면서 회사에 베트남 사람 있을까 생각하고 업서면 걱정도 해서요. 회사 와설때 베트남사람 이서요. 베트남 사람보고 마음이 노이고 기분이 조아서요.”(참여자 4)

2. 온몸으로 분투하기

온몸으로 분투하기는 참여자들이 한국 사업장에서 처음 일을 시작하면서 한국말과 업무에 대한 이중 장벽에 부딪히면서 극한의 고통을 경험하는 가장 힘든 시기로 이를 극복하기 위하여 온몸으로 몸부림치는 시기이다.

참여자들은 알아듣지 못하는 한국말로 인해 암담한 마음이다. 한국인 동료의 입을 뚫어지게 쳐다보면서 한국말을 이해하기 위해 노력하지만 알아들을 수가 없어 제대로 업무를 할 수 있을까 걱정이 된다. 한국인 직장상사의 행동을 눈으로 지켜보면서 몸짓으로 업무를 배운다. 하지만 서툰 업무로 인해 자신이 실수할 때마다 표정이 달라지는 한국인 상사의 얼굴을 보면 온몸이 긴장된다. 모국 사람이 모국어로 설명해 주지만 처음 해보는 일이라 오히려 모국어보다 몸짓언어가 더 도움이 된다.

또한, 참여자들은 익숙하지 않는 일을 같은 자세로 장시간 해야만 하는 고된 작업방식으로 온몸의 통증을 유발하며 불면, 이명, 근육통과 체중감소 등을 호소하기도 한다. 일이 너무 힘들어 회사를 그만두고 싶지만 마음대로 회사를 떠날 수 없는 제도적 구속과 회사 내에서 도움을 받거나 마음을 소통할 수 있는 모국인이 없는 상황이 불안하며 이는 더욱 고통을 가중시킨다.

극심한 고통에 처한 참여자들에게 모국에서 업무에 대한 사전경력과 한국에서 모국집단의 도움, 자원활용능력은 고통을 완화시킨다. 모국에서 여러 지역을 돌아다니면서 다양한 업무 경험과 이주경험은 한국 사업장에서 심리적 압박감을 덜어주며, 모국사람들의 도움은 낯선 타국의 일터 생활에 총체적인 어려움에서도 큰 힘이 된다. 또한, 다른 국적의 근로자들 보다 많은 수를 차지하는 모국집단을 보면서 자신을 보호해 주는 뒷심이 되는 것 같아 마음이 든든하다. 또한, 참여자들은 한국말과 업무를 배우기 위해 모국에 있는 전문가에게 도움을 요청하기도 하고 한국의 근로자지원기관이나 한국교회와 같은 유관기관을 방문하여 다양한 자원을 활용하면서 배우며, 모국 사람을 만나 정보를 교환하면서 서로에게 격려와 용기를 얻기도 한다. 낯선 타국에서 가족을 생각하면서 그리운 마음을 달래며 부모님 목소리를 듣고 또다시 힘을 내어 심리적 안정을 찾는다.

참여자들은 일이 너무 힘들어 그만두고 싶지만 가족들에게 내색하지 못하고 혼자 삭이며 억누르면서 참아낸다. 또한, 자신에게만 업무를 떠미는 타국 근로자와 갈등을 겪으며 거리 두기를 한다. 일부 근로자들은 고된 노동으로 인해 신체적 고통과 통증으로 버티지 못하고 회사를 떠나기도 하지만, 대부분의 참여자들은 가족들에게 경제적, 정신적으로 도움을 주고 싶은 마음에 힘든 상황에도 불구하고 끝까지 참고 견디며 버텨낸다.

“츠음에 반장님 말을 잘 몬 아라 드러요. 무슨 말 하는지 모라서요. 너무 힘드고 답답해서요. 무슨 말하는지 아라드지 모해서 기분이 안 조아서요. 한국말 몰라 일 몬해서요. 속상해서요. 사람들 입 모양만 쳐다 바서요.”(참여자 1)

“그냥 지켜 보아서요. 대리님이 신발, 안경, 마스크 하면 아라요, 물건 보이고 가르키면서 행동하면서 가르쳐 주어써요... 대리님이 물건 들고 행동하면 이해가. (웃음) 12시 밥 머거러 가야대. 1시 일하러 가야대. 7시 마쳐. 시계 보고 행동으로 가르쳐 주어써. 12시 되면 손가락으로 시계 가리치면서 밥 먹는 행동을 해서요. (웃음)”(참여자 5)

“가족들 생각하면서 참아서. 가족들 걱정할까바 힘드지만 참아서. 가족들한테 힘이 되고 시퍼.”(참여자 13)

3. 도약의 발판 구축하기

이 범주는 참여자들이 사업장에서 숱한 시행착오 속에서 혼자 업무를 해내며 일터에서 홀로서기를 하는 경험에 대한 것이다. 참여자들은 끊임없이 실수를 하면서 한국말과 업무를 배워 나가기 시작한다. 한국인 직장상사의 행동을 따라 업무를 해 보지만 쉽지가 않고 실수가 반복된다. 하지만 포기하지 않고 한국인 상사에게 매번 확인받고 잘못된 부분을 수정하고 반복하면서 배운다. 또한 기계를 작동하거나 물건을 만들기 위해서는 한국말이 절대 필요함을 인식하면서 한국어를 배우며 일터에서 한국인 근로자와 교류하기 시작한다.

참여자들은 힘든 상황에도 버티면서 일을 배우고 스스로 하게 되는 것은 가족의 행복이라는 동기가 작용하며, 이 시기에 한국인 상사가 체계적인 방식으로 업무를 가르쳐 줄 때 도움이 되며, 한국인 상사의 관심과 배려는 이들이 일터에 적응해 나가는데 도움이 된다. 모국에서의 기계공부나 한국어 공부와 같은 사전학습은 일을 배울 때 두려움을 떨칠 수 있으며 자신감이 생긴다.

참여자들은 끊임없는 노력을 통해 이제는 업무지시만 듣고도 스스로 해낼 수 있는 단계가 되었다. 이제는 일터에서도 어느 정도 적응을 하여 가족들에 대한 그리움은 마음에 담아두고 감정적으로도 홀로서기를 한다.

“도장공이 옆에서 가르쳐 주어써. 베트남 사람이 그냥 이 기계 3번 칠해, 여기는 4번 칠해, 이러케 가르쳐 주어서요. 잘몬 되면 다시 다 닦아내고 다시 칠해. 츠음에는 일 만이 잘못해서 닦아내고 다시 칠하고 해서. 실수만아 .(웃음).(중략) ‘저 한국말 아라 드러요. 정확하게 말해주세요.’ 회사 와서 6개월 지나서 제가 이야기 해서요”(참여자 5)

“제품 끝나면 다른 금형 해. 내가 금형 바꾸고 일했어. 사무실에서 업무지시 보고 2호기, 3호기 이 소재 끝나고 다른 금형 바꾸고. 사무실에 종이 주면 내가 금형 바꾸고 물건 만들어. 도면 보면 알

수 이서.... "(참여자 9)

4. 새로운 세상에 스며들기

이 범주는 참여자들이 사업장에서 하는 업무와 한국말에 익숙하게 되면서 사업장과 한국 사회와 나아가 미래 자신의 삶에서 자리를 잡아가는 경험에 대한 것이다. 일부 참여자들은 한국생활에 익숙해지면 더 배우기보다는 현재의 삶에 안주하는 모습을 보이며, 반면 다른 참여자들은 업무와 한국말을 끊임없이 연마하며 발전을 위해 도약한다.

참여자들은 사업장에서 전문가 되어 모국인과 타국인 심지어 한국인까지 업무를 가르치기도 하고, 전문자격증이나 한국어 자격증을 취득하여 회사에서 능력을 인정받아 보상을 받기도 한다. 성취욕구가 강한 참여자들은 미래에 대한 꿈을 펼치기 위해 노력하며 이들은 미래의 꿈이 있기에 참고 견딜 수 있다. 또한, 누구보다도 끈기 있게 한국말과 업무를 배우기 위해 적극적으로 행동하며 포기하지 않고 끈질기게 노력한다.

참여자들은 외국인이지만 한국인 동료들과 차별없이 대해주는 회사 분위기에 사업장을 떠나지 않고 계속 일을 하고 싶다는 마음을 가진다. 이들에게 사업주는 그들이 한국의 사업장에서 일을 배우고 한국 사회에 정착할 수 있도록 힘을 주는 든든한 지지자이자 한국 사회에서 버텨낼 수 있는 마음의 안식처이다.

참여자들은 고통스러운 날들을 견디면서 이제는 전문가가 되어 어느덧 회사에 소속감을 느끼면서 이방 사회에 구성원으로 스며들면서 새로운 꿈을 가지면서 비전을 품기 시작한다. 이들은 사업장에서 반장이 되기도 하고 회사에서 정신적 물질적으로 보상을 받으면서 인정받기 시작한다. 또한, 한국의 사업장에서 만난 타국 근로자와 관계를 구축하기도 하고 자신을 챙겨주고 가족처럼 보살펴 주는 한국인을 마음에 품으며, 한국의 사업장에서 자리를 잡으면서 또다른 미래를 계획한다.

"잘해 주요. 외국인인데 돈 업다고 빌려다라고 하니 사장님 뭐할건데 해서요. '비자 바꾸려면 돈 이서야 해요'라고 해서요. 사장님 내말 드고 그냥 가서요. 이트 뒤에 나 부러서요. 통장에 4천만원 너어 줄게. 사장님 4000만원 빌려주. 어떻게 갚을래?라고 무러 바서요. '월급에서 100만원 까라' 해서요. 1년 전에 빌러 주서요. "(참여자 5)

"사장님이 우리 아프면 병원 데려다주고 수술하면 사모님이 직접 간병해 주어요. 사장님, 사모님 진짜 우리한테 잘해 주. 사모님도 우리한테 필요한 것 챙겨 주. 다른 외국 사람도 입원하면 다 챙겨 주.(중략) 내가 비자 바꿀 수 이서면 한국이름 되면 사장님 성, 이름으로 할거에요. 사장님 만이 도와주서. 사장님 업스면 저 한국 업서요."(참여자 16)

"꿈이 커져서요. 다른 나라 호주, 영어 사용하는 나라 미국에 가서 살고 시퍼요."(참여자 5)

논의

본 연구는 구성주의 근거이론 방법을 적용하여 베트남 외국인 근로자의 한국 사업장 일 적응 경험을 탐색하기 위해 시도하였다. 연구결과 베트남 외국인 근로자의 사업장 일 적응 경험은 4개의 주요 범주 '낯선 세계와 직면하기', '온몸으로 분투하기', '도약의 발판 구축하기', '새로운 세상에 스며들기'로 도출되었다.

'낯선 세계와 직면하기'는 본 연구에서 참여자들은 본국과 다른 이질적인 환경에 직면하면서 심리적으로 매우 위축된 상황에서 본국의 가족들과 소통하고 모국인 존재를 확인함으로써 자신의 이질성을 희석시켜 한국사회에 안도하는 것으로 볼 수 있다. 이는 본국에 가족과 친구들을 남긴 채 타국으로 이주하면서 상실감을 느끼고 좌절감이나 우울, 불안, 적대감을 느끼게 된다는 연구결과[20-24]와 유사하다. 이러는 결과는 결혼이민자들의 한국생활 적응이나 취업적응과정, 외국인 근로자들의 적응관련 연구에서 밝혀졌듯이 이주초기에 볼 수 있는 공통적인 현상으로 모국인들의 지지가 매우 중요하다고 본다. 따라서 외국인 근로자들은 입국 초기에 가족이나 모국인 지지체계의 구축이 권장되며, 동일한 사업장 내에 모국인을 배치하는 것과 같은 적극적인 개입이 필요하겠다.

또한, 참여자들에게 사전정보는 두려움과 위축감을 완화하는 요인으로 나타났다. 모국에서 인터넷 등 다양한 매체를 활용하여 한국 사업장의 근로환경과 한국문화를 미리 접한 경험이 한국생활에 도움이 될 것이라 사료된다. 따라서 외국인 근로자들은 취업하기 전 본국에서 이주 국가에 대한 풍부한 사전정보는 이주국에서의 업무와 적응에 도움이 될 것이다.

'온몸으로 분투하기'에서 참여자들은 업무와 한국말을 동시에 배워야 하는 이중적 과제로 인한 압박감으로 극한의 고통에 시달리는 가장 힘든 시기이다. 이는 외국인 근로자들이 처음 업무를 접하거나 생소한 언어에 직면했을 때 스트레스와 좌절감을 느끼는 것으로 나타난 연구결과[23,24]와 유사하다. 외국인 근로자들은 서툰 언어와 문화적 차이로 인해 의사소통이 원활하지 못하고 숙련되지 못한 작업과정으로 인해 내국인보다 산업재해위험 노출정도가 높았다[3]. 따라서 외국인 근로자들은 업무에 투입하기 전에 직무와 관련된 기본적인 한국어 교육과 작업과 관련된 특화된 안전보건교육프로그램이 필요하다. 또한, 정신적, 육체적으로 가장 힘든 시기로 근골격계 질환 및 스트레스가 높을 수 있으므로 보건관리자들의 지속적인 관리가 필요하다.

이 시기에 영향을 미치는 맥락으로 '사전경험'과 '자원 활용능력'으로 확인되었다. 선행연구에서[25] 외국인 근로자들은 모국에서 직무에 대한 사전경험이 많을수록 이해력이 높았으며, 작업에 대한 심리적 압박감이 낮았다. 따라서 외국인 근로자들은 모국에서의 직업 경력이나 이주경험과 같은 사전경험이 업무의 전문성을 높일 수 있으므로 이들의 직업경력 등을 고려하여 작업에 배치하는 것이 필요하다고 사료된다. 또한, 본 연구에서 참여자들은 업무와 한국말

을 배우기 위해 외국인 지원센터나 한국어 교실 등의 자원을 활용하는 것으로 나타났다. 이는 외국인 근로자들이 한국어 교실이나 종교기관 및 기타 기관을 통해 한국어를 배우며 한국의 법과 제도에 대한 정보를 획득하는 것으로 나타난 연구결과[16]와 유사하였다. 따라서 참여자들이 한국어를 배우지 않으면 업무를 할 수 없는 구조이므로 사업장 내에서 한국어를 배울 수 있는 여건마련이 필요하다고 본다.

'도약의 발판 구축하기'에서는 참여자들이 사업장에서 숱한 시행착오 속에서 혼자 업무를 수행하며 사업장에서 홀로서기를 하는 경험에 대한 것이다. 외국인 근로자들의 업무 수행과정을 확인한 선행연구가 없어 직접적인 비교는 어렵지만, 직장 경력이 많을수록 수행도가 높은 것으로 보고된 점을 감안할 때[5] 여러가지 경험들이 외국인 근로자들의 업무에 도움이 되었을 것이라 판단된다.

본 연구결과 촉진조건으로 드러난 한국인 상사의 작업훈련 지원과 관심, 사전학습과 일의 동기는 이들이 업무를 터득하면서 혼자 업무를 해내는데 영향을 주는 것으로 확인되었다. 이는 직장 상사의 지지가 외국인 근로자들의 일적응에 가장 큰 영향력으로 확인된 연구결과[5,26]와 맥을 같이 한다. 이러한 결과는 외국인 근로자의 경우 상사로부터 가장 직접적인 업무지시를 받는 위치에 있어 상사의 지원이 매우 중요할 것으로 보인다. 따라서 외국인 근로자들은 직장상사의 작업훈련방식과 태도가 중요한 요인이므로 이들이 사업장에서 업무를 배울 때 필요한 지원과 도움을 줄 수 있는 한국인 멘토가 필요하다고 사료된다. 본 연구에서 참여자들의 사전학습은 업무를 배우는 중요한 요인이다. 외국인 근로자를 대상으로 한 선행연구[5]에서도 사전학습이 업무능력과 산업재해 발생[27]에 영향을 미치는 것으로 나타나 본 연구결과와 유사하다. 따라서 외국인 근로자들을 현장에 투입하기 전에 업무와 관련된 체계적인 교육을 일정기간동안 시행하는 것이 도움이 될 것이다. 또한 이들에게 실질적인 지원을 하기 위해서는 안전작업방법 등이 포함된 외국어로 된 동영상 업무매뉴얼 개발이 필요하다고 사료된다.

'새로운 세상에 스며들기'에서는 외국인 근로자들은 한국의 사업장뿐만 아니라 한국 사회와 나아가서는 자신의 미래 삶에 자리를 잡아가는 시기이다. 이는 북한이탈주민을 대상으로 한 선행연구[28]에서도 완전한 직업적응을 견딤과 배움의 과정을 통해 조직 구성원으로 소속되고 직장의 기대를 충족하며 진정한 실무자로 자리매김하는 것으로 나타나 본 연구결과와 유사하다. 따라서 외국인 근로자들을 고용 시 교육이나 훈련에 일정 정도 자격을 갖춘 외국은 근로자들을 활용할 수 있는 제도적 장치가 필요하다.

한편 참여자들은 이 범주에서 중요한 요인으로 자신의 성취 욕구와 끈기였다. 이 두 가지 조건은 결국 사업장에서 전문가로서 위치를 차지하며 이는 결국 자신감을 확보하는 바탕이 된다고 본다. 본 연구의 결과를 근거로 하여 일정한 정도의 직업 능력과 한국어 능력을 갖춘 우수한 외국인 근로자들을 한국에서 다치지 않고 건강하고 안정적으로 재정착을 할 수 있는 기반 마련이 필요하다고 사료된다.

이처럼 본 연구에서 베트남 외국인 근로자의 사업장 일 적응 경험을 심층적으로 제시한 것과 이들에게 사용된 전략들을 단계적으로 보여준 것은 추후 외국인 근로자들이 한국 사업장에서 건강하게 적응할 수 있도록 참여와 실습형으로 보완한 안전보건 정보자료로 사업장의 현장 교육 강화, 안전작업 방법 등을 담은 매뉴얼과 외국어 동영상을 개발하여 언어와 업무적응 뿐만 아니라 보건교육을 제공할 수 있는 기초자료가 될 수 있어 그 의의가 크다고 본다.

본 연구는 아래와 같은 제한점이 있다. 첫째, 본 연구의 참여자들은 고용허가제로 입국하여 합법적으로 체류중인 자로 제한하였기에 법적 신분이나 체류 기간을 다양하게 표집하지 않았다. 둘째, 다양한 특성별로 베트남 외국인 근로자를 표집하기 위해 노력했음에도 불구하고 업무 적응과정에서 중도 포기하여 본국으로 되돌아간 자들은 연구 참여자에 포함되지 않았다. 셋째, 참여자들이 외국인 근로자들이라 한국어로 의사소통의 어려움으로 인해 풍부한 표현을 끌어내는 데 있어 제약이 있었을 것이다. 따라서 추후 이러한 한계점을 고려한 연구가 이루어져야 할 것이다.

결론

베트남 외국인 근로자의 한국 사업장에서 일 경험은 '낯선 세계와 직면하기', '온몸으로 분투하기', '도약의 발판 구축하기'와 '새로운 세상에 스며들기'의 4개 범주로 도출되었다. 참여자들은 타국에서 이질스런 사회와 낯선 환경으로 두렵고 위축되지만 모국 친구와 가족들의 지지 속에서 한국어와 업무를 배우기 위해 필사적인 노력을 하였다. 그러나 익숙하지 않는 업무와 장시간 노동으로 온몸의 고통을 느끼는 것으로 나타났다. 숱한 시행착오 속에서 혼자 업무를 해내면서 한국 사업장에서 발판을 마련하고 한국사회에 스며드는 것으로 파악되었다. 이때 한국 상사의 작업훈련 지원이나 관심 및 배려가 이들이 한국 사업장에서 홀로서기를 할 수 있는 원동력이다. 또한, 한국어 자격증과 업무관련 자격증 취득은 한국사회에 자리를 잡을 수 있는 촉진 요인이었다. 따라서 본 연구는 베트남 외국인 근로자의 사업장 일 경험에 대한 심층적이고 총체적인 이해를 제공함으로써 외국인 근로자의 일 적응과정의 체계 마련에 근거를 제공한 것에 의의를 둔다.

이상의 연구 결과를 토대로 다음과 같이 제언하고자 한다. 첫째, 외국인 근로자들의 업무 적응과정에서 중요한 요인인 한국어 교육을 사업장 내에서 진행할 수 있도록 제도적 지원과 이에 대한 한국어 교육프로그램 개발이 필요하다. 둘째, 외국인 근로자들을 작업현장에 투입하기 전에 직무와 관련된 체계적인 교육을 일정기간 시행할 수 있는 작업훈련지원 프로그램 개발과 적용이 필요하다. 셋째, 외국인 근로자들의 사업장 업무 적응과정의 각 단계에 따라 맞춤식 훈련프로그램과 매뉴얼이 개발되어야 할 것이다.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Authors' contributions

Jun, Hyejung contributed to conceptualization, data curation, formal analysis, funding acquisition, methodology, project administration, visualization, writing - original draft, review & editing, investigation, resources, software, and validation. Lee, Gaeon contributed to conceptualization, formal analysis, funding acquisition, methodology, project administration, visualization, investigation, resources, supervision, and validation.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

This article is a condensed form of the first author's doctoral dissertation from Dong-A University.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):117-126
https://doi.org/10.12799/rcphn.2022.00346

발달장애 자녀를 둔 어머니의 불확실성, 사회적지지, 양육부담감과의 관계

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The Relation among Uncertainty, Social Support, Care Burden of Mothers having Children with Developmental Disabilities

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Purpose: This descriptive correlation study aimed to confirm the relation among uncertainty, social support, care burden of mothers having children with developmental disabilities.
Methods: The participants were 111 mothers having children with autistic spectrum disorder or intellectual disability. The collected data were analyzed by descriptive statistics, t-test, ANOVA, Pearson's correlation coefficient and multiple regression using IBM SPSS 23.0 in the study.
Results: Uncertainty and social support were significantly correlated to caregiver burden. As a result of multiple regression analysis, the factors affecting caregiver burden were children's age, the expense for caring, the period suspected child disabilities, and uncertainty. These factors accounted for 40.8% of caregiver burden.
Conclusion: In order to reduce the burden of caring for mothers with children with developmental disabilities, it is necessary to establish a system that can detect children with developmental disabilities early and to develop and provide an integrated guide suitable for the growth and development stage of children with developmental disabilities.

Keywords: Caregiver Burden, Developmental Disabilities, Social Support, Uncertainty

서론

1. 연구의 필요성

우리나라의 등록 장애인은 264만 명이며, 이 중 발달장애인은 25만 명으로 등록 장애인의 9.7%에 해당한다. 발달장애는 2010년 7.0%에서 2020년 9.4%로 증가 추세에 있으며, 연령분포는 0~19세 미만이 25.8%로, 다른 장애 유형에 비해 성장 발달 단계에 있는 대상자의 비율이 높음을 알 수 있다[1].

발달장애란 인지 발달, 사회적 관계, 의사소통의 지연이나 이상(異常)을 특징으로 하며, 인지, 사회성, 운동, 언어 등이 나이에 맞지 않게 현저히 느리고, 실생활을 하는 데 활용할 수 있는 자조(自照) 능력이 낮아 또래에 맞게 발달하지 못하는 것을 의미한다[2]. 발달장애는 영유아기부터 발현되어 장애를 가지고 살아가야 하는 기간이 길고, 성장하면서 아동과 양육자는 다양한 문제에 직면하게 된

주요어: 불확실성, 사회적 지지, 양육부담감, 발달장애
Received: November 24, 2022; **Revised:** April 11, 2023; **Accepted:** April 19, 2023
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다. 그러므로 장애로 인한 문제가 확대되는 것을 방지하고, 이차적인 장애가 발생하는 것을 예방하기 위해 발달 단계에 맞는 조기 개입(Early intervention)이 절실히 필요하며[3], 아동의 발달 평가를 통해 단계에 맞는 발달 목표를 세워 지원하는 것이 중요하다.

발달장애 아동의 주 양육자인 어머니는 아동이 장애 진단을 받는 순간 당황하게 되고, 아동의 성장발달이나 치료와 관련하여 불확실한 상태에 직면하게 된다[4]. 이러한 상태는 부모 역할에 부정적인 영향을 미친다[5]. 불확실성은 상황이나 대상에 대해 예측할 수 없고 무엇이 중요한지 알 수 없는 상태로, 정보 부족, 불명확한 설명, 확신할 수 없는 치료의 효과, 질병 진행 과정에 대한 피드백 부족으로 생성될 수 있는 인지적인 상태이다[6]. 불확실성이 높으면 상황을 평가하는 개인의 능력이 제한되어, 실제보다 더 위협적으로 상황을 평가하여 대처하게 되고 극복을 위한 인지 구조의 형성이 늦어지게 된다. 양육자는 자녀의 예측 불가능한 증상을 경험하며, 같은 상황에 불안함을 느끼고, 자녀의 건강 상태에 민감하게 반응하기 때문에 과보호하는 경향이 높아지며, 이러한 상태가 지속되면 아동을 심리적으로 거부하게 될 수 있어 이들의 불확실성을 확인할 필요가 있다[7].

사회적지지는 사회적 관계로부터 얻는 모든 긍정적인 자원을 의미하며, 신체적·정신적 건강 상태에 직접적으로 영향을 미치거나, 스트레스의 인지 수준을 감소시키는 완충 효과를 통해 삶의 질과 다양한 건강 관련 요인에 영향을 미친다[8,9]. 사회적지지는 장애자녀를 둔 부모들이 위기에 긍정적으로 대처할 수 있도록 하며, 장애자녀를 양육하면서 발생하는 문제점을 극복할 수 있도록 돕는다[10]. 사회적지지는 기능적인 측면에서 정보적, 정서적, 도구적, 평가적 지지를 포함하며, 사회적 기반을 토대로 가족, 전문가 집단, 국가나 지역사회의 지지로 구분될 수 있는데[11], 국내에서 발달장애 자녀를 돌보는 가족들이 인지하는 국가나 지역사회 등 공공기관의 지지 정도를 확인하는 실증적 자료는 부족하여 이에 대한 확인이 필요하다.

발달장애 자녀가 성장함에 따라 장애의 정도는 두드러지게 나타나며[12], 장애에 대한 편견과 발달장애인 낙인으로 인해 가족은 주위의 부정적 시각을 경험하게 된다. 양육자인 어머니는 발달장애 자녀를 평생 돌봐야 하므로 일반 자녀를 양육하는 어머니보다 돌봄에 대한 육체적, 정신적 피로를 더 많이 느낀다. 자녀의 치료와 지속적인 보호를 위한 지출 비용이 증가하기 때문에 부모는 경제 활동에 더 적극적으로 참여해야 하지만, 현실적으로 발달장애 자녀를 보호하기 위해 오히려 근로와 소득 활동을 줄이거나 중단하여 어머니의 재정적 부담은 가중된다. 또한 무력감, 노후 준비의 어려움, 부모 사후에 대한 걱정, 사회적 고립감 등을 경험하여, 이로 인해 심각한 양육부담감을 느낀다[13-15].

양육부담감은 부모가 장애 자녀를 돌보면서 겪는 어렵고 고통스러운 경험으로[16], 높은 수준의 양육부담감은 가족 갈등과 우울 등을 유발하여 이를 지속시키며[17], 아동의 조기 발견 및 진단과 관련된 중요한 정보를 놓칠 수 있게 하므로[18] 발달장애 자녀를 둔 어머니의 양육부담감을 낮출 수 있는 원인을 찾고 실행 가능한 해결책을 찾는 것이 시급하다.

지금까지 발달장애자녀를 둔 어머니를 대상으로 한 연구를 살펴보면, 양육부담감에 관한 연구[12-18], 양육부담감과 사회적지지와의 관계를 밝힌 연구[27,29,31] 등이 다수 있으나, 양육부담감의 수준이 개선되고 있는 실증적 자료가 부족하고, 불확실성과 양육부담감을 고려한 연구가 미미한 실정이다. 이에 본 연구는 발달장애 자녀를 둔 어머니를 대상으로 불확실성, 사회적지지, 양육부담감의 정도를 살펴보고, 양육부담감에 미치는 영향을 확인하여 추후 발달장애 자녀 어머니의 양육부담감을 줄여주는 구체적이고 체계적인 프로그램 개발의 기초자료를 제공하기 위해 시도되었다.

2. 연구의 목적

본 연구는 발달장애 자녀를 둔 어머니의 불확실성, 사회적지지, 양육부담감을 파악하고 양육부담감 영향 요인을 규명하는 것으로 구체적인 목적은 다음과 같다.

첫째, 발달장애 자녀를 둔 어머니의 불확실성, 사회적지지, 양육부담감 정도를 파악한다.

둘째, 발달장애 자녀를 둔 어머니의 불확실성, 사회적지지, 양육부담감의 상관관계를 파악한다.

셋째, 발달장애 자녀를 둔 어머니의 일반적 특성에 따른 불확실성, 사회적지지, 양육부담감 정도의 차이를 파악한다.

넷째, 발달장애 자녀를 둔 어머니의 양육부담감에 영향을 미치는 요인을 파악한다.

연구방법

1. 연구설계

본 연구는 발달장애를 가진 자녀를 둔 어머니를 대상으로 하였다. 대상자 수는 G*Power3.1프로그램을 이용하여 다중회귀분석에 필요한 유의수준 .05, 선행논문[19]을 근거로 하여 중간 정도의 효과크기 .15, 검정력 .80, 예측변수 8개를 기준으로 설정하였다. 최소 표본 수는 109명이었고 탈락율을 고려해 120명을 대상으로 하였으며, 회수된 115부 중 작성이 완료되지 않은 4부를 제외한 111부를 통계분석에 사용하였다.

2. 연구대상

대상자의 선정 기준은 첫째, 자폐성 스펙트럼 혹은 지적 장애, 기타의 증상을 보여 지역 센터에 다니는 자녀의 어머니, 둘째, DSM-5에 의한 자폐성 장애 혹은 지적장애, 기타의 발달장애 진단을 받은 자녀의 어머니를 대상으로 하였으며, 최근 1년 이내 가족의 사망, 암, 수술 등의 큰 스트레스를 경험한 자, 2명 이상의 장애 자녀가 있는 경우, 정신 장애를 제외한 소아 만성질환 자녀가 있는 어머니는

연구대상에서 제외하였다.

3. 연구 도구

1) 불확실성

불확실성은 질병의 경험과 관련된 불명확한 설명, 정보 부족, 예측할 수 없는 증상, 확신할 수 없는 치료 효과와 질병 진행 과정에 대한 피드백 부족으로 생성될 수 있는 인지적 상태로[6], 본 연구에서는 Mishel이 개발한 불확실성 지각 측정 도구(Parent's Perception Uncertainty Scale: PPUS) [6]를 Park과 Oh [20]가 장애아의 부모를 대상으로 수정 보완한 도구로 측정한 점수를 의미한다. 본 도구는 애매모호성 12문항, 불일치성 7문항, 복잡성 4문항, 불예측성 4문항과 미분류 1문항(27번)으로 총 28문항 구성되어 있으며, '매우 그렇다' 5점, '그렇다' 4점, 그저 그렇다' 3점, 아니다' 2점, '전혀 아니다' 1점으로 자가 보고형 5점 Likert 척도를 사용하였다. 점수가 높을수록 불확실성이 높은 것을 의미하며, 도구 개발 당시 신뢰도 Cronbach' α=0.91였고 본 연구의 신뢰도 Cronbach' α=0.90이었다.

2) 사회적지지

사회적지지는 개인의 삶에서 스트레스 상황에 노출되었을 때 사회적 결속을 통하여 상호 인간적 도움을 받을 수 있는 것으로[9], 본 연구에서는 Song [11]이 개발한 사회적지지 도구로 측정한 점수를 의미한다. 본 도구는 20문항의, 자가 보고형 척도로서 '항상 있음' 4점, '자주 있음' 3점, '가끔 있음' 2점, '전혀 없음' 1점으로 구성되어 있는 4점 Likert 척도를 사용하였다. 본 연구자는 대상자별 지지 정도를 파악하기 위해 대상군을 가족, 전문가, 공공기관의 지지로 구분하여 측정하였다. 점수가 높을수록 사회적지지가 높은 것을 의미하며, 도구 개발 당시 신뢰도 Cronbach' α=0.97이었다. 본 연구의 신뢰도 Cronbach' α=0.94이다.

3) 양육부담감

양육부담감은 가족이 장애 자녀를 돌보면서 겪는 어렵고 고통스러운 부정적인 영향 및 불편감을 말하며 양육자의 긴장, 스트레스, 부담, 보살핌 결과 등으로 인한 만성적 스트레스 상태로[21], 본 연구에서는 Kwon [22]의 치매 노인 부양부담감 측정을 위해 개발한 도구를 Kwon [23]이 발달장애인 어머니의 양육 부담을 측정하기 위해 수정·보완한 도구로 측정한 점수를 의미한다. 가족적 측면 11문항, 사회적 측면 8문항, 미래에 대한 부담 4문항, 기관에 대한 부담 3문항, 경제적 부담 2문항 및 심리 정서적 부담 2문항으로 총 30문항이며, '매우 그렇다' 5점, '그렇다' 4점, 그저 그렇다' 3점, 아니다' 2점, '전혀 아니다' 1점으로 자가 보고형 5점 Likert 척도를 사용하였다. 점수가 높을수록 양육부담감이 높은 것을 의미하며, 도구 개발 당시 신뢰도 Cronbach' α= .95였다. 본 연구의 신뢰도 Cronbach' α=.92이다.

4. 자료수집

본 연구의 자료수집은 경기도와 경상남도에 있는 복지관, 아동발달센터, 장애아동 부모회 등 6개 기관을 선정하여 2019년 9월부터 11월까지 수행되었다. 연구자가 각 기관을 대상으로 자료수집을 승낙받은 후, 기관을 방문하여 대상자에게 연구의 목적, 방법, 절차를 설명하여, 동의 받은 후 설문지를 배부하고 수거하였다. 연구에 참여, 설문지 작성의 전 과정은 대상자의 자발적인 참여를 원칙으로 하였다.

5. 분석방법

수집된 자료는 SPSS/WIN(version 23.0 for Science) 통계 프로그램을 이용하여 분석하였다.

1) 발달장애 어머니의 일반적 특성은 빈도와 백분율을 산출했다.
2) 불확실성, 사회적지지, 양육부담감은 평균과 표준편차를 산출하였다.
3) 일반적 특성에 따른 대상자의 불확실성, 사회적지지, 양육부담감은 t-test, ANOVA, Sheff' test를 하였다.
4) 발달장애 어머니의 불확실성, 사회적지지, 양육부담감 상관관계는 Pearson Correlation Coefficient로 산출하였다.
5) 발달장애 어머니의 양육부담감 영향 요인을 확인하기 위해 다중회귀분석을 이용하였다.

6. 윤리적 고려

본 연구는 차 의과학대학교 윤리심의위원회의 승인을 받은 후 (IRB No. 1044308-201906-HR-034-01) 시행하였다. 대상자를 보호하기 위해 윤리적 원칙에 의해 자료 수집 전 연구의 필요성, 연구 취지를 설명한 후, 협조를 얻어 발달 장애아동 어머니들에게 연구의 목적, 방법, 절차, 자유롭게 참여할 수 있음과 참여에 대한 이익 및 위험을 알려주고, 언제든지 강요 없이 철회할 수 있음을 알려주었다. 설문지는 익명성을 보장하고, 연구목적으로만 사용될 것이며, 비밀보장이 가능함을 알려주고 난 후 참여 여부를 결정하도록 하였고, 자발적으로 연구를 참여하기로 한 대상자에게 서면 동의를 받은 후, 직접 기록한 뒤 회수하였다. 설문지 완료 후 소정의 상품을 지급했으며, 연구 종료 후 설문자료를 분쇄 폐기 처리할 것을 알려주었다.

연구결과

1. 대상자의 일반적 특성

본 연구에 참여한 발달장애 자녀를 둔 어머니의 연령은 41~49세가 61.0%, 40세 미만이 32.4%였다. 최종학력은 대학교 졸업이 64.0%로 가장 많았고, 종교는 무교가 53.2%로 과반수 이상이었다. 직업은 전업주부가 58.6%로 가장 많았고, 월 소득은 400만 원 이상이 50.5%, 200만원 미만이 9.9%였다(Table 1).

발달장애 자녀는 남아가 70.3%였고, 연령은 6~10세가 46.0%로 가장 많았다. 장애 유형은 지적 장애 53.2%, 자폐성 장애 35.1% 순이었다. 자녀의 장애 정도는 의사 소견만 있는 경우가 27.0%, 2급 26.1%, 1급 23.4%이었으며, 치료 기간은 24개월 이하가 37.8%로 가장 많았다. 치료비용은 10만 원 이상~50만 원 미만이 52.3%이었고, 발달 장애 이상 소견 의심 시기는 13~30개월 사이가 40.1%

Table 1. General characteristics of children with developmental disabilities and mother(*N*=111)

Variables		Categories		n	%	M ± SD
Children with developmental disabilities	Gender	Male		78	70.3	
		Female		33	29.7	
	Age (years)	≤ 5		27	24.3	
		6-10		51	46.0	8.92 ± 4.28
		> 10		33	29.7	
	Disability Type	Intellectual disability		59	53.2	
		Autism Disorder		39	35.1	
		Others		13	11.7	
	Degree of disability	Grade 1		26	23.4	
		Grade 2		29	26.1	
		Grade 3		17	15.3	
		Doctor's opinion only		30	27.0	
		Others		9	8.1	
	Duration of treatment (months)	≤ 24		42	37.8	
		25-72		33	29.7	64.32 ± 55.30
		> 72		36	32.4	
	Treatment Costs (10,000won)	10 ≤ & < 50		58	52.3	
		50 ≤ & < 100		31	27.9	
		> 100		22	19.8	
	Timing of Doubts of Abnormal Findings (months)	≤ 12		33	29.7	
		13-30		45	40.5	26.27 ± 20.33
		> 31		33	29.7	
	Voucher Satisfaction Target and mount	Receiving	Satisfied	50	45.0	
			Not satisfied	22	19.8	
		Not receiving		39	35.1	
Mother	Age (years)	< 40		36	32.4	
		40-50		68	61.3	41.60 ± 5.53
		≥ 50		7	6.3	
	Education	High school		29	26.1	
		University		71	64.0	
		Master		11	9.9	
	Religion	Christian		23	20.7	
		Buddhism		12	10.8	
		Catholic		17	15.3	
		Other		59	53.2	
	Job type	Full time		13	11.7	
		Part time		25	22.5	
		House wife		65	58.6	
		Other		8	7.2	
	Monthly income (10,000 won)	< 200		11	9.9	
		200 ≤ & < 300		20	18.0	
		300 ≤ & < 400		24	21.6	
		400 ≤ & < 500		25	22.5	
		≥ 500		31	27.9	

였으며, 이를 포함하여 부모가 자녀의 발달장애와 관련된 특징적 증상을 발견하는 시기는 출생 시부터 30개월 이하까지 70.3%였다. 발달 바우처 지원과 관련하여 72명은 대상자로 선정되어 서비스를 이용하고 있었다. 총 대상자 중 바우처 서비스를 만족스럽게 받는 대상자는 45.0%이고, 바우처 서비스를 받지만 만족하지 않는 대상자는 19.8%, 바우처 서비스를 받지 못하고 있는 대상자는 35.1%였다. (Table 1).

2. 대상자의 불확실성, 사회적지지, 양육부담감 정도

발달장애 자녀를 둔 어머니의 불확실성 점수는 5점 만점에 2.89점이었고, 하위 영역은 불일치성 2.68점, 애매모호성 3.05점, 복잡성 2.35점, 불예측성 3.30점이었다. 발달장애 자녀를 둔 어머니의 사회적지지 점수는 4점 만점에 1.99점이었고, 하위 영역은 가족 지지 2.70점, 전문가 지지 1.84점, 공공기관 지지 1.43점이었다. 발달장애 자녀를 둔 어머니의 양육부담감 점수는 5점 만점에 3.12 점이었고, 하위영역은 기관의 부족에 따른 부담 4.17점, 미래 부담 3.87점, 경제적 부담 3.58점, 심리 정서적 부담 3.19점, 사회적 부담 3.14점, 가족적 부담 2.45점이었다(Table 2).

3. 대상자의 불확실성, 사회적지지, 양육부담감의 상관관계

발달장애 자녀를 둔 어머니의 불확실성, 사회적지지, 양육부담감과의 상관관계를 분석한 결과 불확실성과 사회적지지는 유의한 음의 상관관계($r=-.29$, $p=.002$), 불확실성과 양육부담감은 유의한 양의 상관관계($r=.58$, $p<.001$), 사회적지지와 양육부담감은 유의한 음의 상관관계($r=-.25$, $p=.010$)를 보였다(Table 3).

Table 2. Comparison of uncertainty, social support, caregiver burden for mothers with developmentally disabled children (*N*=111)

Variables	n	Mean ± SD	Min	Max
Uncertainty	27	2.89 ± 0.51	1.53	5.00
Inconsistencies	7	2.68 ± 0.50	1.43	5.00
Ambiguity	12	3.05 ± 0.73	1.25	5.00
Complexity	4	2.35 ± 0.57	1.00	5.00
Unpredictability	4	3.30 ± 0.69	1.75	5.00
Social Support	60	1.99 ± 0.39	1.17	4.00
Family Support	20	2.70 ± 0.63	1.15	4.00
Expert Support	20	1.84 ± 0.51	1.15	4.00
Public Authorities Support	20	1.43 ± 0.46	1.15	4.00
Caregiver Burden	30	3.12 ± 0.69	0.90	5.00
Family Burden	11	2.45 ± 0.73	2.75	5.00
Social burden	8	3.14 ± 0.87	1.00	5.00
Future Burden	4	3.87 ± 1.00	1.00	5.00
Burden of agency shortage	3	4.17 ± 0.94	1.00	5.00
Economic burden	2	3.58 ± 1.22	0.00	5.00
Psychological burden	2	3.19 ± 1.13	0.00	5.00

4. 대상자와 자녀의 일반적 특성에 따른 불확실성, 사회적지지, 양육부담감

발달장애 자녀와 어머니의 일반적 특성에 따른 불확실성에는 통계적으로 유의한 차이가 나타나지 않았다. 사회적 지지는 바우처 대상자로 선정된 것 또는 지원 금액에 대한 만족여부($F=7.36$, $p=.001$) 와 어머니의 연령($F=3.42$, $p=.036$)에서 유의한 차이가 있었다. 바우처를 받는 대상자 중 바우처 대상자로 선정된 것 또는 지원 금액 중에 한 가지 이상 만족하는 경우 사회적 지지는 2.14점으로 바우처를 받지 않는 경우의 1.84점보다 높았다. 어머니의 연령이 40대 미만의 경우 사회적 지지는 2.10점으로 50대 이상의 1.72점보다 높았다. 양육부담감은 치료비용($F=4.70$, $p=.011$), 바우처 대상자로 선정된 것 또는 지원 금액에 대한 만족여부($F=3.84$, $p=.024$)에서 통계적으로 유의한 차이가 있었다. 발달장애 자녀에 대한 치료비용이 50만 원 이상~100만 원 미만인 경우 양육부담감이 3.42점으로 10만 원 이상~50만 원 미만의 3.04점, 100만 원 이상의 2.91점보다 높은 것으로 나타났다. 또한 바우처 서비스를 이용하지만 만족하지 않는 경우의 양육부담감은 3.47점으로 서비스를 받지 않는 경우의 2.98점 보다 높았다. (Table 4).

5. 대상자의 양육부담감에 영향을 미치는 요인

대상자의 양육부담감에 영향을 미치는 요인을 알아보기 위해 다중회귀분석을 실시하였다. 독립변수들의 다중공선성 분석 결과, 공차 한계(tolerance)는 최소 .79에서 최대 .96으로 0.1 이상으로 나타났으며, 분산 팽창지수(Variance Inflation Factor, VIF) 값은 최소 1.05에서 최대 1.27로 모두 10 미만으로 독립변수 간의 다중 공선성의 문제가 없는 것으로 나타나 잔차의 정규성과 등분산성을 충족하였고, Durbin-Watson 값이 1.81로 2에 가까워 독립성을 만족하였다.

투입 변수 선정은 부모와 자녀의 일반적 특성, 불확실성, 사회적지지 전체를 설명 변수로 하고 양육부담감을 반응 변수로 하여 다중 회귀 분석을 실시한 결과, 영향요인으로 자녀 연령, 자녀의 치료 지출 금액, 이상 소견 의심 시기, 불확실성이 선정되었다. 회귀분석 결과 불확실성($\beta=.51$, $p<.001$), 치료비용($\beta=.23$, $p=.004$), 자녀의 연령($\beta=.19$, $p=.016$), 자녀의 이상 소견 의심 시기($\beta=-.17$, $p=.028$)가 양육부담감을 40.8% 설명하였으며, 불확실성이 양육부담감에 가장 큰 영향을 주는 것으로 나타났다(Table 5).

Table 3. Correlation among uncertainty, social support, caregiver burden for mothers with developmental disabilities (*N*=111)

Variables	Uncertainty	Social Support	Caregiver Burden
Uncertainty	1.00	-.29 (.002)	.58 (< .001)
Social Support		1.00	-.25 (.010)
Caregiver Burden			1.00

Table 4. Uncertainty, social support, and care burden due to the general characteristics of the child with developmental disabilities and mother(N=111)

Characteristic		Category		n	Uncertainty		Social Support		Caregiver Burden	
					Mean ± SD	t/F (*p*)	Mean ± SD	t/F (*p*)	Mean ± SD	t/F (*p*)
Children with developmental disabilities	Gender	Male		78	2.90 ± 0.54	0.35 (.729)	2.00 ± 0.41	0.01 (.990)	3.18 ± 0.69	1.34 (.183)
		Female		33	2.86 ± 0.46		2.00 ± 0.35		2.99 ± 0.66	
	Age (years)	≤ 5		27	2.97 ± 0.61	1.42 (.246)	2.02 ± 0.42	1.02 (.363)	3.06 ± 0.81	1.40 (.250)
		6-10		51	2.80 ± 0.48		1.87 ± 0.40		3.05 ± 0.67	
		> 10		33	2.97 ± 0.48		1.91 ± 0.34		3.29 ± 0.59	
	Disability Type	Intellectual disability		59	2.82 ± 0.56	1.11 (.333)	1.93 ± 0.41	1.89 (.156)	3.13 ± 0.70	1.56 (.214)
		Autism Disorders		39	2.98 ± 0.46		2.06 ± 0.35		3.21 ± 0.54	
		Others		13	2.92 ± 0.48		2.11 ± 0.34		2.83 ± 0.94	
	Degree of disability	Grade 1		26	2.91 ± 0.61	0.24 (.915)	1.98 ± 0.39	0.61 (.658)	3.35 ± 0.64	1.36 (.267)
		Grade 2		29	2.93 ± 0.47		2.07 ± 0.43		3.14 ± 0.62	
		Grade 3		17	2.94 ± 0.49		1.92 ± 0.41		3.14 ± 0.37	
		Doctor's opinion only		30	2.83 ± 0.54		2.01 ± 0.33		3.05 ± 0.78	
		Others		9	2.83 ± 0.42		1.89 ± 0.40		2.63 ± 0.96	
	Duration of treatment (months)	≤ 24		42	2.88 ± 0.52	0.01 (.989)	2.02 ± 0.38	0.73 (.485)	3.10 ± 0.75	0.15 (.857)
		25-72		33	2.90 ± 0.46		2.03 ± 0.40		3.10 ± 0.60	
		> 72		36	2.89 ± 0.58		1.93 ± 0.38		3.18 ± 0.70	
	Treatment Costs (10,000won)	10 ≤ & < 50^{a}		58	2.89 ± 0.47	1.45 (.239)	1.96 ± 0.36	0.70 (.499)	3.04 ± 0.66	4.70 (.011) b > a,c†
		50 ≤ & < 100^{b}		31	2.99 ± 0.56		2.01 ± 0.36		3.42 ± 0.56	
		> 100^{c}		22	2.75 ± 0.57		2.07 ± 0.49		2.91 ± 0.80	
	Timing of Doubts of Abnormal Findings (months)	≤ 12		33	2.82 ± 0.53	1.44 (.242)	1.91 ± 0.42	1.27 (.286)	3.27 ± 0.75	1.92 (.151)
		13-30		45	2.99 ± 0.53		2.04 ± 0.40		3.15 ± 6.70	
		> 31		33	2.83 ± 0.48		2.03 ± 0.33		2.95 ± 0.57	
	Voucher Satisfaction Target and mount	Receiving	satisfied^{a}	50	2.84 ± 0.51	1.96 (.146)	2.14 ± 0.41	7.36 (.001) a > c†	3.08 ± 0.64	3.84 (.024) b > c†
			Not satisfied^{b}	22	3.09 ± 0.43		1.96 ± 0.37		3.47 ± 0.48	
		Not receivingc		39	2.85 ± 0.56		1.84 ± 0.30		2.98 ± 0.78	
Mother	Age (years)	< 40^{a}		36	2.89 ± 0.51	0.05 (.948)	2.10 ± 0.42	3.42 (.036) a > c†	3.01 ± 0.69	2.68 (.073)
		40-50^{b}		68	2.89 ± 0.52		1.97 ± 0.35		3.13 ± 0.70	
		≥ 50^{c}		7	2.95 ± 0.56		1.72 ± 0.43		3.66 ± 0.60	
	Education	High school		29	3.00 ± 0.48	1.82 (.167)	2.03 ± 0.41	0.19 (.828)	3.12 ± 0.64	0.02 (.985)
		University		71	2.82 ± 0.51		1.98 ± 0.40		3.12 ± 0.69	
		Master		11	3.05 ± 0.66		2.01 ± 0.29		3.16 ± 0.84	
	Religion	Christian		23	2.75 ± 0.61	0.90 (.443)	2.08 ± 0.39	0.96 (.415)	2.98 ± 0.74	2.04 (.112)
		buddhism		12	2.99 ± 0.46		2.10 ± 0.38		3.51 ± 0.41	
		Catholic		17	2.85 ± 0.47		1.93 ± 0.39		3.27 ± 0.55	
		Other		59	2.94 ± 0.50		1.96 ± 0.39		3.06 ± 0.72	

(Continued to the next page)

Table 4. Continued

Characteristic	Category	n	Uncertainty		Social Support		Caregiver Burden	
			Mean ± SD	t/F (*p*)	Mean ± SD	t/F (*p*)	Mean ± SD	t/F (*p*)
Job type	Full time	13	3.06 ± 0.71	1.19 (.316)	2.00 ± 0.27	0.32 (.812)	3.25 ± 0.78	0.25 (.860)
	Part time	25	2.90 ± 0.54		2.01 ± 0.45		3.14 ± 0.65	
	House wife	65	2.89 ± 0.48		1.97 ± 0.39		3.11 ± 0.71	
	Other	8	2.62 ± 0.36		2.11 ± 0.41		3.00 ± 0.51	
monthly income (10,000 won)	< 200	11	3.14 ± 0.56	0.74 (.569)	1.99 ± 0.41	0.26 (.906)	3.23 ± 0.68	0.20 (.936)
	200 ≤ & < 300	20	2.90 ± 0.49		1.99 ± 0.45		3.11 ± 0.57	
	300 ≤ & < 400	24	2.84 ± 0.44		2.06 ± 0.32		3.03 ± 0.60	
	400 ≤ & < 500	25	2.84 ± 0.50		1.96 ± 0.41		3.16 ± 0.59	
	≥ 500	31	2.88 ± 0.60		1.97 ± 0.39		3.14 ± 0.89	

[†] Scheffé test

논의

본 연구는 발달장애 자녀를 둔 어머니의 불확실성, 사회적지지와 양육부담감의 정도를 확인하고 양육부담감에 영향을 미치는 요인을 규명하여 발달장애 자녀를 둔 가족을 위한 구체적인 프로그램과 정책개발에 기초 자료를 제공하기 위해 시도되었다.

발달장애 자녀를 둔 어머니의 불확실성은 5점 만점에 2.89점으로 미숙아 어머니 1.62점[25], 만성질환아 어머니 2.48점[24], 장애아 어머니 2.50점[19]에 비해 다소 높은 편이었다. 미숙아 어머니는 미숙아의 출생 직후에 자녀가 정상 발달 궤도로 진입할 수 있을 지에 대한 불확실성이 높을 수 있으나, 다른 건강 문제가 없는 것으로 확인되면 대체로 정상 성장발달을 기대할 수 있다. 만성질환을 진단받은 아동의 경우, 장기간 치료와 경제적 부담이 지속됨에도 불구하고 질환 별로 알려진 관리방법이나 예후에 대한 정보가 발달장애보다는 상대적으로 적지 않을 수 있다. 또한 모든 장애유형의 아동을 포함한 연구는 장애 별로 원인이나 치료 및 예후의 수준이 다양할 수 있어, 본 연구의 결과보다 불확실성 정도가 낮을 수 있다. 발달장애 자녀의 경우 성장발달 단계에서 수시로 발생하는 증상을 예측하거나 대처하는 것이 어렵고, 경험적 자료가 많지 않기 때문에 다른 장애아동 어머니보다 불확실성 정도가 높은 것으로 사료된다. 본 연구에서 대상자의 불확실성 하부영역 중 불예측성과 애매모호성이 다른 하위영역보다 높은 점수를 보였으며, 이는 장애아동이나 만성질환 아동을 대상으로 한 선행연구 결과와 일치하였다[20,24]. 불예측성은 질병의 예후와 미래에 대한 예측이 불가능한 것을 의미하고, 질병의 재발이 반복될 때 경험하며, 애매모호성은 질병의 원인과 결과를 정확히 인지하지 못하는 상태로 원인이 명확하지 않고 모호할 때 야기된다. 가까운 시일 내에 일어나게 될 아동의 상태를 미루어 짐작하지 못하고, 발달장애 증상이 주위 사람들에게 반복적으로 보이므로 발달장애 자녀의 어머니는 일반 아동과 비교되는 답답한 상황을 지속적이고 반복적으로 경험하게 된다.

사회적지지는 개인을 중심으로 대인관계로부터 얻을 수 있는 모든 긍정적인 자원을 의미하며, 이런 자원은 위기 상황을 극복할 수 있도록 하고, 스트레스로 인해 발생할 수 있는 다양한 문제를 예방해준다[15]. 본 연구에서 사회적지지 평균은 4점 만점에 1.99점으로 발달장애인을 대상으로 한 최근 연구의 2.92점[27], 3.15점[28]과 비교해 볼 때, 상당히 낮은 것을 확인할 수 있다. 이들 연구에서 발달장애인의 연령은 평균 13~15세 이거나[27], 10대가 과반수 이상[28]인 반면, 본 연구에서 대상 자녀의 연령은 6~10세가 대부분이었다. 발달장애아를 양육하는 어머니는 자녀의 연령이 어릴수록, 장애 선별과 정확한 진단에 대한 막연한 불안을 더 느끼게 되고, 이는 실질적으로 지원받을 수 있는 전문가나 사회서비스의 기회가 많지 않음과 연관된다고 할 수 있다. 본 연구에서 사회적지지 중 공공기관의 지지가 1.43점으로 매우 낮은 것은 현 상황을 반영하는데, 발달장애 자녀 양육과 관련하여 조기진단, 조기 개입과 장기간 치

Table 5. Effect on caregiver burden of mothers of children with developmental disabilities (*N*=111)

Variable		B	SE	β	t	*p*
Intercept		28.07	9.88	.00	0.00	.284
Child age		0.91	0.40	.19	2.45	.016
Treatment	50≤ & < 100	10.63	0.37	.23	2.91	.004
Costs (10,000 won)	& ≥ 100	0.180	4.24	.00	0.97	.040
Timing of Doubts of Abnormal Findings		0.17	0.08	.17	2.22	.028
Total Uncertainty		0.73	0.11	.51	6.85	< .001
		$R^2 = 0.44$, Adj $R^2 = 0.41$, F = 16.19, $p = < .001$, d (du) = 1.806				

β=Standardized beta; SE=standard error.

료를 위해 공공기관의 지지가 필수적이나, 주요 정책들이 장애아동 개인에게 초점이 맞춰져 있고, 부모의 양육기능을 부분적으로만 지지하고 있어, 발달장애 자녀가 있는 가족의 실질적인 욕구가 제대로 충족되지 못할 가능성이 있다[29]. 본 연구 결과에서 바우처 제공에 만족하는 대상자는 바우처를 제공받지 못하는 경우보다 사회적 지지가 높아, 공공기관으로부터의 바우처 제공여부가 이들 대상자가 인지하는 긍정적 자원과의 접근성에 영향하고 있었다. 중앙정부나 지방자치단체는 발달장애 자녀를 둔 가족을 대상으로 한 지속적인 정보적, 정서적, 경제적 지원을 제공할 수 있는 방안을 마련해야 할 것이다

발달장애 자녀를 둔 어머니의 양육부담감은 높을 것으로 예측되었으나, 본 연구결과 보통 수준으로, 발달장애 자녀를 둔 어머니를 대상으로 한 선행연구와 비슷하였다[23]. 이는 부모가 자녀를 돌보는 것을 당연하게 여기는 문화적 전통에 기반하며[30], 아동의 건강 상태와는 무관하게 부모가 자녀의 양육에 최선을 다해야 한다는 당위성과 신념 및 대처 방법이 반영된 결과로 발달장애 자녀의 양육부담감에 대한 이해와 접근은 문화적 특수성이 고려되어야 한다는 점을 시사한다[5]. 또한 선행연구결과, 성장발달 단계에 있는 자녀를 돌보는 부모의 양육부담감은 성인 자폐 자녀를 둔 어머니의 양육부담감보다 높은 것으로 보고된 점과[6], 본 연구결과 양육부담감의 하위영역 중 위탁, 교육 및 기관의 부족함과 미래에 대한 부담이 가장 높은 것은 선행연구 결과와도 유사하였다[31], 이는 성장발달 단계에 있는 발달장애 자녀는 일상생활 전반에 대한 돌봄이 필요할 뿐 아니라, 발달장애인으로 살아가야 할 미래를 대비할 수 있는 적응훈련을 함께 제공해야 하는 것과의 관련성에 있어 보인다.

본 연구에서 발달 장애 자녀를 둔 어머니의 양육부담감에 영향을 미치는 요인을 분석한 결과, 자녀의 연령, 자녀의 치료비용, 이상 소견 의심 시기, 불확실성으로 확인되었다. 첫째, 자녀의 연령이 많을수록 양육부담감이 높았는데, 이는 자녀의 연령이 많을수록 어머니의 자녀양육기간이 길다는 것을 의미하며, 성인이 되어가는 자녀의 미래에 대한 부담감이 누적되기 때문인 것으로 해석될 수 있다. 둘째, 자녀의 치료비용이 50만 원 미만보다 50~100만 원인 경우 양육부담감이 더 높았다. 자녀의 치료 비용이 높아질수록 경제적 부담이 가해져 양육부담감이 높아지는 것을 확인하였다. 셋째, 자녀의 이상 소견 의심 시기는 어릴수록 양육부담감이 높아졌다. 자녀의 연령이 어릴수록 장애를 가지고 살아가야 할 기간이 길어지고, 부모의 자녀 돌봄 기간이 길어질 수밖에 없기 때문인 것으로 사료된다. 넷째, 불확실성 중 애매모호성이 높을수록 양육부담감이 높았다. 장기간 치료 동안 질병의 원인, 예후 및 치료효과가 불확실하다고 느낄수록 양육부담감이 높은 것을 확인하였다.

발달장애 자녀 어머니의 양육부담감을 감소시키기 위해서는 발달장애를 조기에 진단하고 관리할 수 있는 효율적인 시스템이 필요하다. 현재 영유아 건강검진이 시행되고 있으나, 발달 이상을 조기에 선별하고, 연속적인 관찰 및 피드백을 통한 환류시스템이 다소 미흡하다. 발달장애 특성상 태어날 때부터 외형적으로 발견하기 어렵고, 성장할수록 점차 증상이 드러나며, 조기 발견 시 적절한 중재를 제공하면 장애를 최소화할 수 있으나[26], 시기에 맞는 중재가 늦어지면 잔존하는 발달 능력뿐만 아니라 이차, 삼차 장애로 이어질 수 있다. 따라서 발달장애에 대한 진단-검사-치료의 원스톱 서비스를 구축하고[32], 발달단계에 맞는 바우처 지원의 효율성을 높이며, 이들 가족에 대한 다각적인 이해를 기반으로 한 정보의 수집과 관리, 실증적 자료를 바탕으로 한 교육과 안내가 필요하다고 하겠다.

결론

본 연구는 발달장애 자녀를 둔 어머니의 불확실성, 사회적 지지, 양육부담감의 정도를 확인하고 양육부담감에 영향하는 요인을 규명하기 위해 시도되었다. 발달장애 자녀를 둔 어머니의 불확실성은 다소 높은 수준이었으며, 낮은 정도의 사회적 지지와 보통수준의 양육부담감을 보였다. 또한 양육부담감에는 자녀의 연령, 자녀의 이상 상태를 의심한 시기, 자녀 치료비용, 불확실성이 영향을 주는 것으로 나타났다.

이상의 연구 결과를 바탕으로, 다음과 같은 제언을 하고자 한다. 첫째, 발달장애 자녀를 둔 가족의 불확실성과 삶의 경험이나 현황을 알 수 있는 다양한 접근법을 활용한 반복연구를 제안한다

둘째, 아동의 발달장애 등의 건강문제를 조기에 발견할 수 있는 실효성 있는 선별검사 운영방안을 마련해야 한다. 이를 위해 현재 실시되고 있는 영유아 건강검진의 내실화와 함께 환류시스템의 개선을 제안한다.

셋째, 어린이집과 같은 아동 보육 기관에서 발달검사를 실시하거나 보육교사를 통한 조기 이상자 발견을 할 수 있는 프로그램의 개발이 필요하다. 현재 일부 지자체는 간호사가 어린이집이나 보육 기관을 주기적인 방문하여, 건강문제의 조기발견과 조처를 적시에 시행하여 그 효과가 확인되고 있다. 이러한 프로그램의 확대 시행을 제안한다.

넷째, 발달장애자녀가 있는 가족을 지원할 수 있는 특화된 상담과 치료서비스가 지속될 수 있는 체계가 마련되어야 하며, 활용 가능한 다양한 안내서 및 교육자료의 개발과 제공이 필요하다.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Authors' contributions

Jeong, Kyoung Eun contributed to conceptualization, data curation, formal analysis, methodology, project administration, visualization, writing - original draft, review & editing, investigation, resources, software, and validation. Suk, Min Hyun contributed to conceptualization, methodology, project administration, supervision, visualization, writing - review & editing, and validation.

Data availability

Please contact the corresponding author for data availability.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 1225-9594 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):127-134
https://doi.org/10.12799/rcphn.2023.00045

부천시 통합방문간호센터 방문간호서비스 이용 성과 연구

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A Study on Outcomes of the Utilization of Visiting Nursing Service at the Integrated Visiting Nursing Center in Bucheon-si

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Purpose: The government has implemented a pilot project for community care for older adults and the integrated visiting nursing center in Bucheon-si operated by public fund of government to provide visiting nursing service for older adults. This study aimed to analyze the outcomes of the utilization of visiting nursing service at the integrated visiting nursing center in Bucheon-si.
Methods: This study linked the personal data from the pilot project for community care with the National Health Insurance data. The final subjects comprised 30 participants and 110 of the matched control group. The length of home stay, hospitalization, and the admission for long-term care facilities or convalescent hospitals were measured. Statistical analysis was performed through difference-in-differences analysis using generalized estimating equation and Cox proportional hazards model.
Results: The results indicated an increase of 28.2 days for length of home stay and a reduction of 69% in hospitalization from medical institutions and 81% in admission of long-term care facilities or convalescent hospitals among participants compared to the control group.
Conclusion: The visiting nursing service of the integrated visiting nursing center was effective in extending length of home stay and lowering the hospitalization of medical institutions and admission of long-term care facilities or convalescent hospitals.

Keywords: Home Health Nursing, Community Health Services, Hospitalization

서론

1. 연구의 배경 및 필요성

우리나라의 평균 기대수명은 83.5세로 OECD 국가 중 평균 수명(80.5세)을 상회하고 있으며, 2070년 우리나라 기대수명은 90세를 넘어서면서 OECD 38개 회원국 중 가장 높을 것으로 예측하고 있다[1]. 이러한 노인 인구의 증가가 가족의 부양부담과 돌봄 욕구로 연결되면서, 돌봄체계 구축에 대한 요구도 또한 계속해서 증가하고 있는 추세이다.

2020년 노인실태조사에 따르면, 전체 노인의 56.5%가 거동이 불편해도 현재 살고 있는 집에서 계속 살고 싶다고 응답하였으며, 전체 노인의 83.8%가 건강이 유지되는 한 현재 집에서 계속 살고 싶

주요어: 방문간호, 지역사회 건강 서비스, 입원
Received: January 10, 2023; **Revised:** April 20, 2023; **Accepted:** April 20, 2023

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다고 응답하였다[2]. 이처럼 지역사회 계속 거주를 희망하는 국민의 요구에 따라 정부와 지자체에서도 Aging in Place(살아온 집에서 노후 보내기) 실현을 위해 노인의 건강 유지를 위한 다양한 보건의료서비스를 제공하고 있다. 특히, 거동이 불편한 노인을 대상으로 방문의료, 방문간호 등 건강 유지를 위한 다양한 보건의료 서비스를 직접 제공하기 위한 모형 개발에 힘쓰고 있다. 특히, 지역사회 거주 노인의 46.4%가 방문간호서비스를 원한다고 응답한 조사 결과를 고려하면, 지역사회 중심의 방문간호서비스 욕구가 증가하는 것을 확인할 수 있다[3].

국내에서 시행 중인 방문간호 서비스 제도는 보건소 방문건강관리사업, 의료기관 가정간호사업, 장기요양 방문간호서비스 등이 운영되고 있다. 보건소 방문건강관리사업은 1990년 일부 지자체에서 보건소를 통하여 부분적으로 실시하기 시작하였으며, 보건소에 이용자가 내소하여 건강관리서비스를 받기 어려운 지역주민을 대상으로 보건소 방문간호사 등이 가정 등에 직접 방문하여 건강관리서비스를 제공하는 서비스이다[4]. 의료기관 가정간호 사업은 2000년 의료법 개정으로 의료기관 가정간호에 대한 법적 근거가 마련되어 그 해 1월부터 시작되었으며, 가정간호로 치료의 지속적 유지와 심리적 안정감 도모 등을 통해 삶의 질 향상이나 국민의료이용 편의제고 및 가계부담 절감이 목적인 사업이다[5]. 마지막으로, 장기요양 방문간호서비스는 2008년 7월 장기요양보험이 도입되면서, 거동불편, 치매 등으로 인한 노인성 질환으로 일상생활이 어려운 중증 노인을 대상으로 전문 장기요양 서비스를 제공하고자 도입되었다. 재가급여의 한 종류로 운영되고 있는 방문간호서비스는 장기요양원의 간호사 등이 의사나 한의사 또는 치과의사의 방문간호지시서를 통해 장기요양 수급자의 가정을 방문하여 간호나 진료보조, 요양상담 등을 장기요양 급여로 제공하는 서비스이다[4,5]. 이러한 다양한 방문간호제도 도입에도 불구하고, 돌봄 세팅의 분절화, 건강상태의 변화에 따라 간호서비스가 필요한 시점에 방문간호 서비스를 제공하지 못함으로 건강 돌봄의 사각지대가 지속해서 발생하고 있다. 게다가 서비스 공급기관 중심의 분절적 서비스 제공과 공급기관들의 지역간 격차 등으로 인해 건강 돌봄의 사각지대는 더욱 악화되고 있는 실정이다[6]. 이러한 사각지대 해소를 위해서는 보건의료 요구가 있는 대상자들이 요양병원에서 퇴원한 이후나 급성기 치료 후 전환기에 지역사회에 거주하면서 건강관리를 할 수 있도록 분절화되어 있는 의료와 요양, 돌봄의 서비스가 통합적으로 제공되는 방문간호가 제공되어야 한다[7,8].

이에 정부에서는 커뮤니티케어 구현을 위해 지역사회 통합돌봄 추진 로드맵을 수립하고 노인이 살던 곳에서 건강한 노후를 보낼 수 있는 포용국가라는 비전으로 지역사회 통합돌봄 선도사업을 추진하였다[9]. 본 선도사업은 기존의 보건의료 서비스(방문진료, 방문간호 등)와 장기요양서비스(방문요양, 방문목욕 등), 주거 및 복지서비스(주택개보수, 가사지원서비스, 식생활 및 이동 지원 서비스 등) 등 분절적으로 제공되어 왔던 서비스를 연계하고, 부족한 서비스에 대해서는 지자체에서 예산을 투입하여 추가 서비스를 구성하여 대상자의 필요에 따른 통합적 돌봄서비스를 제공하였다. 그러나, 선도사업을 추진하면서 방문진료, 방문간호 등 서비스가 불충분하다는 지적이 지속되었고, 정부는 별도 예산을 마련하여 보건의료 서비스를 강화하는 특화프로그램을 공모하였다.

부천시의 통합방문간호센터는 특화프로그램에 선정되어 별도 예산을 지원받았으며 노인의 건강관리와 불필요한 재입원, 재입소 방지를 위해 보건소에 설치 및 운영하고 있다. 방문간호센터에 대한 선행 연구들에서는 방문간호서비스 제공 성과에 관한 연구결과[10-16]들이 있었지만, 통합돌봄체계 내에서의 공적 예산 투입을 통한 방문간호서비스 성과에 대한 근거는 부족하다. 따라서 향후 통합돌봄 보편화를 대비하여 통합방문간호센터의 방문간호서비스의 성과를 평가가 필요한 시점이다.

2. 연구목적

본 연구는 경기도 부천시의 지역사회 통합돌봄 선도사업의 특화서비스로 운영되고 있는 통합방문간호센터의 방문간호서비스 효과를 분석하고자 수행되었다. 구체적으로 통합방문간호센터 이용자를 대상으로 재가 거주기간, 의료기관 입원률, 요양시설과 요양병원 입원율에 실제 어떠한 효과가 있었는지 파악하고자 하였다.

연구방법

1. 연구설계

본 연구는 준실험설계(quasi-experimental study design)에서 자주 활용되는 방법론인 이중차분법(difference in differences; DID)을 통해 성과평가를 수행하였다[17]. 준실험설계는 정책이나 사업을 개입(intervention)으로 간주하여 정책이 적용되거나 사업에 참여한 대상을 시범군으로 간주하여 정책 및 사업의 효과를 평가하는 연구설계방법이며, 이중차분법(difference in differences; DID)은 특정한 정책이나 사업의 성과를 평가하기 위해 사용하는 방법론이다.

2. 연구자료

본 연구에서 사용한 조사 자료는 사업에 참여한 노인의 성명, 주민등록번호, 서비스 이용일자 및 종결일자 등의 정보를 포함하고 있으며, 지역사회 통합돌봄 선도사업에 참여한 지방자치단체 담당자가 사업에 참여한 노인을 대상으로 조사를 수행하였다. 연구자는 지자체 담당자로부터 조사된 결과를 제공받았으며 수집한 대상자의 개인정보를 건강보험 DB에 연계하여 사용하였다. 건강보험 DB는 우리나라 전국민에 대한 자격 정보(성별, 연령, 보험료 등), 사망정보(사망원인, 사망일자 등), 건강보험 진료정보(입원, 외래, 약제), 노인장기요양보험 자격 및 서비스 이용 정보가 포함되어 있다. 이 연구는 선도사업 대상자 중 통합방문간호센터의 서비스를 이용한 대상자를 대상으로 개인정보활용에 대한 동의를 얻었으며 주민

등록번호를 비식별 ID로 변환하여 건강보험 DB와 연계하였다.

3. 연구대상

본 연구는 통합돌봄 선도사업지역인 경기 부천에서 추진한 통합방문간호센터 특화서비스로 보건소 중심의 통합방문간호 설치운영을 통한 커뮤니티케어(보건의료) 플랫폼 구축을 목적으로 설치되었다. 연구 대상은 지역사회 통합돌봄 선도사업 참여자 중 2021년 8월 1일부터 2022년 3월 31일까지 통합방문간호센터의 방문간호서비스를 이용한 노인으로 정의하였다. 부천시의 통합방문간호센터는 방문간호서비스가 필요한 통합돌봄 대상자를 중심으로 건강사정과 치료요구에 따른 케어플랜 수립, 사례회의를 수행하였으며, 방문간호서비스는 평균 8개월 동안 주 1회 이상 교육 및 훈련(식이요법, 체위변경법 등), 욕창관리, 비위관 및 요로관 관리와 같은 치료적 간호가 제공되었다. 43명 중 대상 정보 중복 2명, 방문거부, 사망, 대상자 미선정 등의 사유로 8명, 최소 관찰기간(3개월) 미만 1명, 그리고 65세 미만 2명을 제거하여 30명을 선정하였다(Figure 1).

유사한 특성을 가진 대조군을 선정하기 위해 성향점수매칭방법을 활용하였다. 2021~2022년 간 통합방문간호센터 방문간호서비스를 이용하지 않은 노인 총 10,675,870명을 대상으로 시범군과 성별, 연령, 가구소득, 동반상병지수, 최근 1년간 입원여부, 최근 3년간 정신질환 이력, 장애 여부, 장기요양보험 등급, 독거여부가 유사한 대조군 4배수를 추출하여 대조군 110명을 선정하였다[18].

4. 변수

본 연구는 통합방문간호센터 운영 효과 평가를 수행하기 위해 3개의 지표를 선정하였다. 재가 거주기간의 경우 시범군의 사업참여 전-후 관찰기간 전체에서 의료기관 입원 또는 장기요양기관 입소기간을 제외하여 계산하였다. 의료기관 입원율의 경우 시범군의 사업참여 전-후 관찰기간 전체에서 의료기관 입원 여부를 측정하였다. 요양시설 및 요양병원 입(소)원율의 경우 기준시점 이전에 발생할 가능성이 매우 적어 전-후 비교분석이 적합하지 않은 지표이므로 사업참여 후 관찰기간동안 요양시설 입소 또는 요양병원 입원 여부를 측정하였다.

선택 편향을 줄이기 위해 이 연구는 시범군과 유사한 특성을 가진 대조군을 성향점수매칭을 통해 선정했으며 매칭 변수는 성별, 연령, 가구소득, 동반상병지수, 최근 1년간 입원여부, 최근 3년간 정신질환 이력, 장애 여부, 장기요양보험 등급, 독거여부를 활용하였다[20,21]. 가구소득은 보험료 분위를 활용하여 5분위로 구분하였으며 동반상병지수는 charlson's comorbidity index를 활용하여 측정하였고 0, 1, 2, 3, 4, 5, 6이상으로 분류하였다. 최근 1년 내 입원여부는 서비스 최초 이용일자(기준시점) 최근 1년 내 입원서비스 이용여부를 측정하였다. 정신질환 보유여부는 기준시점 기준 최근 3년 내 정보를 활용하여 국제질병분류 10차 개정판 코드 상 주상병 F00–F99로 측정된 경우로 정의하였다. 노인장기요양보험 등급은 노인장기요양보험의 1-2등급, 3-5등급 및 인지지원등급, 미인정자로 분류하였다. 독거여부는 주민등록 상 가구원 수 정보를 활용하여 1인가구 여부로 측정하였다.

5. 통계분석방법

본 일반적 특성 비교 및 동질성 검정을 수행하기 위해 범주형 변수의 경우 Chi-square test, 연속형 변수일 경우 Independent t-test를 사용하였다. 효과평가의 경우 동일한 대상자에게 전-후 비교 분석하는 형태로 반복측정하기 때문에 전-후 차이에 대한 값에서 연속형 변수일 경우 Paired t-test, 범주형 변수일 경우 McNemar's test를 활용하였다.

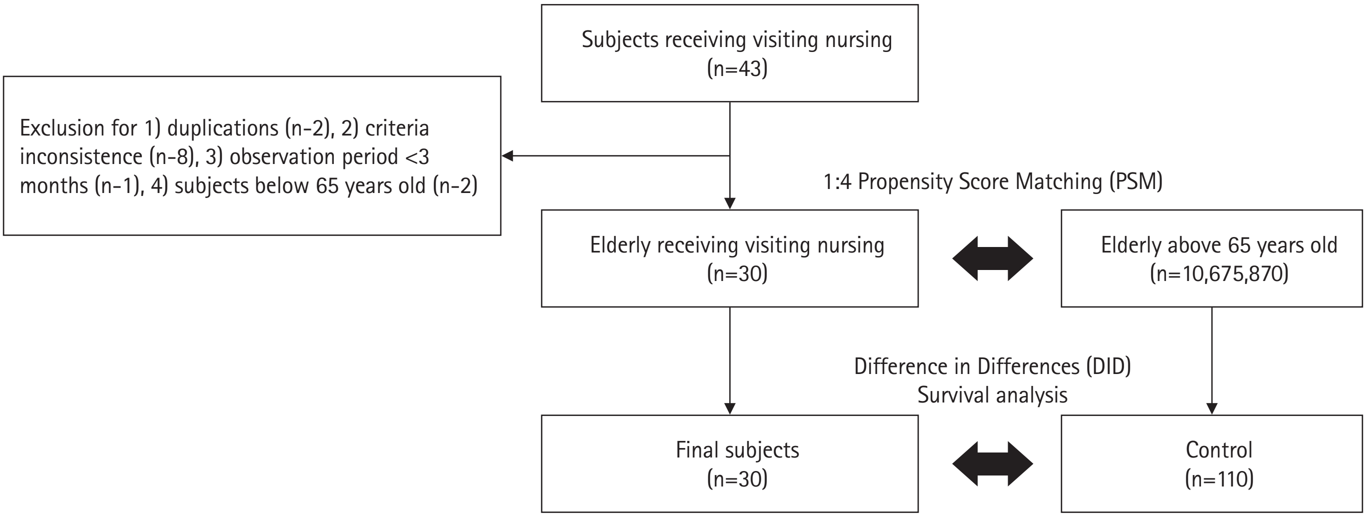

Figure 1. Flow chart of study subjects

이중차이분석의 경우 기준시점으로부터 사망하였거나, 통합방문간호센터 서비스가 종결되었을 경우 해당 일자까지 관찰하였다. 앞의 두 사건이 발생하지 않은 대상자의 경우 2022년 6월 30일까지 관찰하였는데, 이는 최종분석대상자 중 가장 최근 기준시점이 2022년 3월임에 따라 최소 3개월의 관찰기간을 확보하기 위해서이다. 기준시점 이후 관찰기간을 기준시점 이전에도 동일하게 할당하였고 매칭된 대조군에 기준시점과 사전, 사후 관찰기간을 동일하게 할당하였다(Figure 2). 생존분석의 경우 기준시점부터 추적관찰하여 관찰이 종료되는 시점까지 측정하여 비교분석 하였다. 이중차이분석의 경우 일반화추정방정식(generalized estimating equation, GEE)을 사용하였으며 종속변수가 이분형일 경우 DIST=BINOMIAL, LINK=LOGIT을 적용하였다. 대상구분 변수와 시점구분 변수 간 교호작용 값에 EXPONENTIAL 치환 후 오즈비 및 95% 신뢰구간을 산출하였으며 연속형 변수일 경우 대상구분 변수와 시점구분 변수간 교호작용 값을 사용하였다. 모든 통계분석은 양측검정을 수행하여 *p*-value 값이 0.05미만일 경우 통계적으로 유의하다고 해석하였다. 결과변수가 연속형 변수일 경우 대상자별 상이한 관찰기간을 표준화하기 위해 관찰 기간을 1년으로 표준화한 보정값을 제시하였다.

장기요양시설 입소 또는 요양병원 입원의 경우 기준시점 이전에 발생할 가능성이 매우 적기 때문에, 이 연구는 해당 지표에 대해 사후 추적관찰을 통한 생존분석을 수행하였다. 생존분석은 콕스비례위험회귀모델(Cox proportional hazards regression model)을 사용하였으며 위험비 및 95% 신뢰구간을 산출하였다. 기준시점부터 추적 관찰하여 사건 발생일 경우 1로 코딩하고 관찰 기간 내 사건이 발생하지 않을 경우(censored) 0으로 코딩하였다. 방문간호서비스 최초 이용시점을 baseline 시작시점으로 하여2022.06.30까지 관찰하며 관찰 기간 중 1) 사망하였거나, 2) 방문간호서비스가 종결된 경우 해당 일자까지 관찰하였다. 비례위험가정이 통계적으로 평가되었고 위배되지 않았다. 본 연구는 SAS 9.4 버전을 활용하였다. 본 연구는 개인정보 동의를 기반으로 수행된 원 연구(IRB No. 2022-HR-03-025)에서 수집한 자료를 일부 활용하여 수행한 이차자료 연구로서, 연구자가 속한 기관의 심의면제 승인을 받았다(IRB No. 2022-HR-05-004).

연구결과

1. 대상자의 일반적 특성

시범군은 총 30명, 대조군은 110명이었으며 사전-사후 평균 관찰기간은 각각 244일(약 8개월), 전체 평균 관찰기간은 488일이었다. 통합방문간호센터 방문간호서비스를 이용한 노인의 경우 여성이 73.3%, 저소득이 66.7%, 동반상병지수가 4점 이상이 56.7%, 최근 1년 내 입원 경험이 전체 50%, 전체 60%가 치매 보유자, 56.7%가 장애인, 53.3%가 노인장기요양보험 인정자, 63.3%가 독거였다. 2021년 및 2022년 기준 10,675,870명(중복 제거) 노인과 비교했을 때 모든 변수들에서 시범군과 통계적으로 유의한 차이가 있었다.

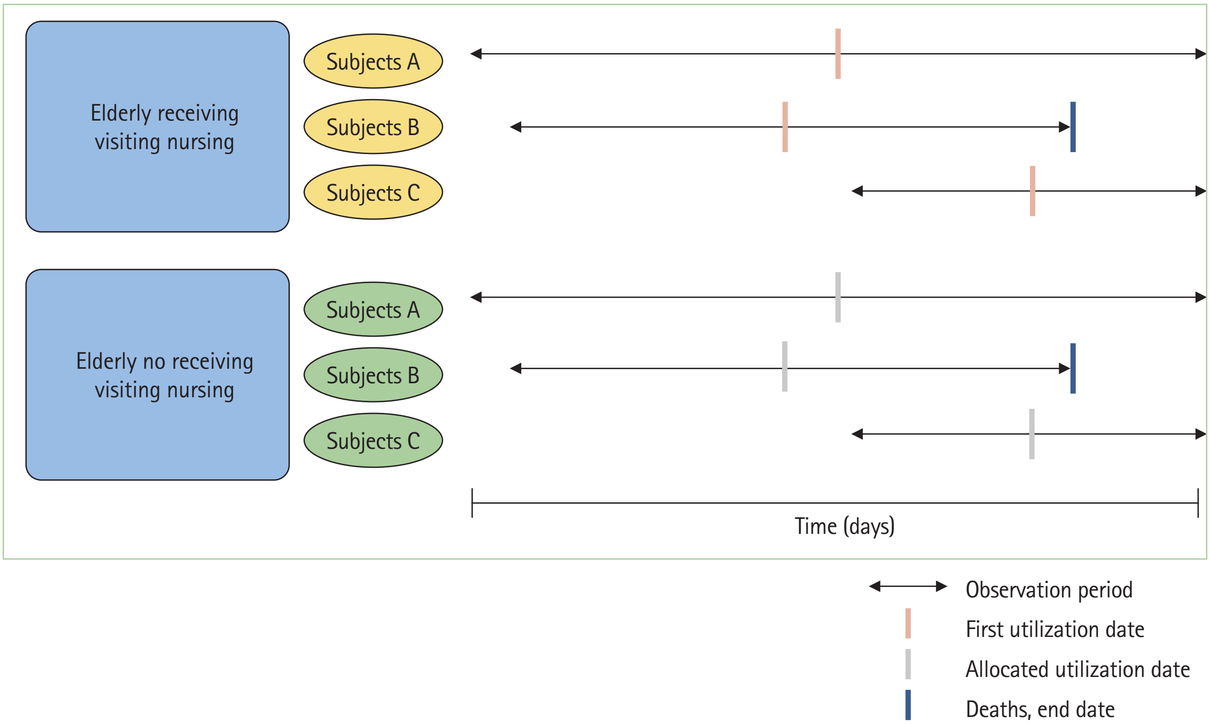

Figure 2. Diagram for difference in differences(DIDs)

https://doi.org/10.12799/rcphn.2023.00045

매칭 후 대조군 110명과 비교했을 때 모든 변수들에서 시범군과 통계적으로 유의한 차이가 없었다(Table 1).

2. 재가 거주기간 변화

재가 거주기간 분석결과, 시범군은 참여 전 1인당 연평균 344일, 참여 후 360.6일로서 16.6일 증가하였으나 대조군의 경우 오히려 11.4일 감소하여 이중차이 값인28.0일(95% Confidence interval [CI]: 7.62-43.12) 통계적으로 유의($p < .023$)하게 증가하였다(Table 2).

3. 의료기관 입원율

의료기관 입원율 분석결과, 시범군의 경우 참여 전 46.7%, 참여 후 23.3%로서 16.7%p 감소하였으나 대조군의 경우 2.8%p 증가함으로써 이중차이 값인0.31배(95% CI: 0.19-0.68), 즉 69% 통계적으로 유의($p < .002$)하게 감소하였다(Table 2).

4. 요양시설 입소 또는 요양병원 입원율

장기요양시설 입소 또는 요양병원 입원율 분석결과, 대조군 대비

Table 1. General characteristics of study subjects

Variables		Pre-PSM					Post-PSM		
		Elderly receiving VNS		Elderly no receiving VNS		*p*-value	Elderly no receiving VNS		*p*-value
		n	%	n	%		n	%	
Total		30		10,675,870			110		
Sex									.812
	Men	8	26.7	4,760,351	44.6		27	24.5	
	Women	22	73.3	5,915,519	55.4		83	75.5	
Age (mean ± SD)		80.93	6.63	73.94	7.71	<.001	81.12	7.74	.871
Household income						<.001			.900
	Q1 (lowest)	20	66.7	668,118	6.3		72	65.5	
	Q2	3	10.0	1,960,820	18.4		11	10.0	
	Q3	2	6.7	1,728,770	16.2		4	3.6	
	Q4	3	10.0	2,229,853	20.9		17	15.5	
	Q5 (highest)	2	6.7	3,947,876	37.0		6	5.5	
CCI						<.001			.980
	0	2	6.7	3,020,655	28.3		4	3.6	
	1	2	6.7	2,404,505	22.5		9	8.2	
	2	3	10.0	1,849,981	17.3		9	8.2	
	3	6	20.0	1,285,513	12.0		21	19.1	
	4	2	6.7	843,704	7.9		11	10.0	
	5	5	16.7	520,353	4.9		22	20.0	
	6≤	10	33.3	751,159	7.0		34	30.9	
Inpatient						<.001			.477
	Yes	15	50.0	2,349,198	22.0		47	42.7	
	No	15	50.0	8,326,672	78.0		63	57.3	
Psychiatric diseases						<.001			.517
	Yes	18	60.0	2,870,991	26.9		73	66.4	
	No	12	40.0	7,804,879	73.1		37	33.6	
Disability						<.001			.742
	Yes	17	56.7	1,557,381	14.6		66	60.0	
	No	13	43.3	9,118,489	85.4		44	40.0	
Long-term care Insurance						<.001			.591
	1-2 grade	6	20.0	179,048	1.7		14	12.7	
	3-6 grade	10	33.3	888,279	8.3		42	38.2	
	No	14	46.7	9,608,543	90.0		54	49.1	
Living alone						<.001			.686
	Yes	19	63.3	2,844,939	26.6		74	67.3	
	No	11	36.7	7,817,686	73.2		36	32.7	

Note. SD: standard deviation, CCI: Charlson's comorbidity index, PSM: propensity score matching, VNS: visiting nursing service

Table 2. Analysis result of the length of home stay and hospitalization as the effect of the integrated visiting nursing center

Outcome	Group	Pre-period	Post-period	Difference for pre-post	Difference-in-differences		
		Mean ± SD			Estimates or OR	95% CI	*p*-value
Home stay period (days)	Intervention (n = 30)	344.03 ± 50.91	360.64 ± 12.53	16.61	28.02	7.62-43.12	.023
	Control (n = 110)	332.32 ± 93.94	320.94 ± 109.50	-11.43			
Hospitalization (n, %, %p)	Intervention (n = 30)	14 (46.7%)	7 (23.3%)	-16.7*	0.31	0.19–0.68	.002
	Control (n = 110)	38 (34.5%)	41 (37.3%)	2.8			

OR: odds ratio, CI: confidence interval.

Table 3. Analysis result of the admission for long-term care facilities or convalescent hospitals as the effect of the integrated visiting nursing center

Group	The number of admission	HR	95% CI	*p*-value
Intervention (n = 30)	2 (6.7%)	0.19	0.05-0.81	< .001
Control (n = 110)	32 (29.1%)	1.00		

HR: hazard ratio, CI: confidence interval.

시범군의 위험비가 0.19배(95% CI: 0.05-0.81)로서, 즉81% 통계적으로 유의($p < .001$)하게 감소하였다(Table 3).

논의

본 연구는 지역사회 통합돌봄 선도사업에 참여한 부천시 통합방문간호센터에서 제공한 서비스의 효과성을 평가하고자 수행되었다. 분석결과, 통합방문간호센터 이용군이 대조군에 비해 의료기관 입원율이 감소하였으며, 요양시설 또는 요양병원 입원율 또한 통계적으로 유의하게 감소하며 통합방문간호센터 이용군이 대조군에 비해 재가 거주기간이 유의하게 증가하였다.

부천시의 통합방문간호센터는 방문간호서비스가 필요한 통합돌봄 대상자를 중심으로 건강사정과 치료요구에 따른 케어플랜 수립, 사례회의를 통한 방문간호, 욕창간호 및 치료 등을 수행하고 있다. 특히, 통합방문간호 1팀이 직접 자택에 방문하여 질환평가와 치료계획을 수립하여, 욕창 등 처치 중심의 가정간호서비스를 제공하며, 대상자의 초기사정을 통해 대상자 선정여부와 케어플랜 수립을 실시한다. 체계적인 케어플랜 수립을 위해 간호팀에서 매주 사례회의를 통해 대상자의 치료 경과를 공유하고, 대상자 종결, 모니터링 등 관리전환 여부를 결정한다. 이를 통해 지속적인 대상자 순환이 이루어지면서 포괄적 사정과 케어플랜을 통해 다양한 욕구에 대한 대응이 가능해 지역사회 거주 가능성을 향상시켰다는 데 의의가 크다. 이처럼 지속적인 대상자 관리 중심 시스템이 지역사회 계속 거주를 가능하게 할 수 있는 효과라고 사료된다. 또한, 정기적으로 방문간호서비스가 필요한 대상자에게 공공자원(보건소)을 이용하여 임상적으로 필요한 고난이도의 간호서비스를 제공하고, 효과평가 결과 통합방문간호센터 이용자의 의료기관 입원율 감소와 장기요양시설 입소 또는 요양병원 입원율은 통계적으로 유의하게 감소하였으며, 재가 거주기간이 증가했다는 점에서 큰 의미가 있다. 이는 앞서 다양한 선행연구[10-12]와 살펴볼 수 있듯이 방문간호의 효과가 긍정적으로 평가되었다는 결과를 뒷받침하는 연구결과이다. 특히 부천시의 통합방문간호센터의 설립 취지는 거동불편자의 수요에 비해 방문형 간호서비스의 질적, 양적 공급이 미흡한 상황으로 인해 거동불편자의 시설입소 등을 지연하는 것이었다. 이러한 취지를 위해 부천시 통합돌봄 대상자 중 거동불편자에게 개별 사례회의를 통해 간호서비스의 난이도를 조절하는 등 지역주민에게 체계적으로 개인맞춤형 건강관리 서비스를 제공함으로써 불필요한 개인의 시설입소를 지연하고 지역사회 계속거주를 가능하게 할 수 있었다고 사료된다.

그러나, 이러한 효과평가에도 통합방문간호센터를 유지하는 데 여러 한계점과 문제점은 존재한다. 부천시의 통합방문간호센터 운영 기간동안 코로나19로 인해 당초 가정간호, 방문간호, 방문건강관리사업 대상자를 중심으로 운영 예정이었으나 가정간호(욕창) 중심으로 사업을 운영되어 대상자 선정과 연계의 한계가 있었다. 보건복지부에서 수행한 지역사회 통합돌봄 선도사업의 일환으로 정기적인 예산 확보가 어렵고, 보상체계나 지불체계 등이 공식화되어 있지 않으며 현재까지 통합돌봄 법 개정 등 제도적인 한계가 있다[21]. 특히, 방문간호에서 필수적으로 구성되어야 하는 가정전문간호사의 인력 수급 문제와 방문의료 외 업무 수행으로 환자에 대한 정기적인 관리나 갑작스러운 건강상태 변화에 대한 대응을 할 수 있도록 필수 전담 인력이 부재하고, 방문간호의 대상자가 대부분 거동불편자로서 전문재활서비스가 필요한 대상자임에도 물리(작업, 재활) 치료사 등이 필수적임에도 전담인력이 부재하여 지원이 불가능한 상황이다[6,22,23]. 또한, 서비스 종결 등 기본적인 절차나 서비스 제공과정에 대한 전반적인 매뉴얼이 미비하고 정기적인 교육지원이 필요하다는 의견이 많다[22]. 특히 통합돌봄에서 운영하는 방문간호 서비스의 경우 국가사업으로 본인부담금 없이 무료로 제공되고 있는데 이는 서비스 제공량의 조정이 어려우며, 이용 당사자에 대한 도덕적 해이 발생 가능성이 존재한다. 이러한 문제를 해결하기 위해 본인부담금 설정에 대한 논의와 다양한 형태에서 현재 방문간호 서비스를 별도 운영하고 있는 것을 예방 접근에서 보건소 방문건강관리서비스와 연계하여 통합적 운영이 필요하다[24].

본 연구가 지역사회 통합돌봄의 관점에서 지역사회 거주기간 연

장과 요양기관, 요양병원 입소율 감소 등 긍정적인 결과를 제시했음에도 불구하고 다음과 같이 몇 가지 제한점을 가진다. 첫째, 본 연구의 통합방문간호 서비스 대상자는 지역사회 통합돌봄 선도사업에서 제공되었던 집수리, 가사지원 등 복지서비스가 다른 서비스들과 함께 서비스가 제공되었을 가능성이 있다. 이러한 추가 복지서비스는 통합방문간호 서비스를 제공하지 않는 지역에서의 지역사회 관리 영역에서 다른 통합서비스가 본 연구 결과와 같은 지표 결과에 긍정적인 영향을 미쳤는지에 대한 근거는 별도로 마련되어 있지 않아 실제 다른 통합돌봄 서비스가 이 연구에 긍정적인 결과에 영향을 미쳤을 수도 있다는 한계가 있다. 둘째, 연구대상자가 매우 적어 일반화의 어려움이 있다. 이러한 제한점에서도 불구하고, 부천시의 통합방문간호센터 모형은 인력, 서비스, 제도 등 다양한 측면에서 한계점이 있지만, 앞서 연구 결과에서처럼 재가거주기간 연장, 의료기관 입원율 감소, 장기요양 시설 입소, 요양병원 입원율 감소 등은 향후 방문간호 서비스가 지역사회 계속 거주를 위한 통합돌봄 실현에 효과적이라는 것을 입증하는 결과이다. 무엇보다도 지역사회 통합돌봄 선도사업 지역에서 추진된 통합방문간호센터의 운영에 대한 성과를 본 첫 연구라는 점에서 의의가 있다.

결론

본 연구는 지역사회 통합돌봄 선도사업에 참여한 경기도 부천시의 통합방문간호센터 방문간호서비스 이용자를 대상으로 방문간호서비스에 대한 효과를 평가한 연구이다. 부천시에서 운영한 통합방문간호센터는 돌봄이 필요한 노인에게 방문간호서비스를 제공함으로써 재가 거주기간을 연장시켰고, 의료기관 입원율과 요양시설 또는 요양병원 입원(소)율을 감소시켰다. 이 연구는 지역사회에 소재한 보건소 자원 활용에 대한 사례와 성과를 제시했다는 점에서 의의가 있으며 향후 지역사회 통합돌봄 구현을 위해 보건소를 통한 통합방문간호센터의 운영의 근거로 활용될 수 있을 것으로 사료된다 [20,21].

본 연구는 향후 방문간호 서비스 정책 방향에 대한 근거자료 제공을 위해 아래와 같이 제안하고자 한다. 첫째, 간호사, 작업치료사와 같은 필수 인력배치와 포괄적이고 연속적인 방문의료서비스 제공체계 구축이 필요하다. 둘째, 서비스 제공자를 위한 서비스 제공 프로토콜 마련과 최신 의학정보 등을 제공하기 위한 교육지원이 필요하다. 셋째, 현재 본인부담 없이 무료로 이용하고 있는 대상자의 도덕적 해이 발생 등을 고려하여 서비스 이용 관리 기전 마련이 필요하며, 넷째, 예방적 서비스인 보건소 방문건강관리 서비스와 통합적 운영이 필요하다.

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Conflict of interest

The authors declared no conflict of interest.

Funding

This study was conducted with funding from the Ministry of Health and Welfare(grant number: 00228145200).

Authors' contributions

Park, Hyun-Kyung contributed to conceptualization, visualization, and writing - original draft, review & editing. Yoo, Ae Jung contributed to project administration, visualization, writing - review & editing, supervision, and validation. Yoon, Ju Young contributed to visualization, and writing-review & editing. Choi, Jae Woo contributed to conceptualization, data curation, formal analysis, methodology, visualization, writing - review & editing, and validation.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

None.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):135-146
https://doi.org/10.12799/rcphn.2023.00038

Cyberbullying among University Students during the E-learning Transformation Era: The Role of the Student-Teacher Relationship and Virtual Classroom Community

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Purpose: The current study assesses cyberbullying among university students and explores the role of the student-teacher relationship and virtual classroom community.
Methods: A descriptive exploratory study on four randomly selected colleges at Damanhour University/Egypt. Participants were recruited conveniently using an equal allocation of 150 students/college (600 students). The European Cyberbullying Intervention Project Questionnaire (ECIPQ), Rovai's Classroom Community Scale (RCCS), and the Student Version of The Teacher-Student Relationship Inventory (S-STRI) were used for data collection.
Results: Low cyber victimization was reported by 66.5% of the students, while 39.8% reported low cyberaggression behaviors. The highest percent reported average virtual class connectedness (77.3%), learning experience (70.3%), and overall virtual classroom community (80.8%). Besides, highly satisfying teacher relationships (82.3%); average (38.8%) and low (35.8%) instrumental help; low conflict (68.0%); and average total teacher-student relationship (70.5%). Regression analysis revealed that the increased scores of the total teacher-student relationship scale ($p<0.05$) with its two domains [satisfaction and instrumental help ($p<0.01$)] and the total classroom community scale ($p<0.05$) with its domains [connectedness ($p<0.01$) and learning experience ($p<0.05$)] decreased the likelihood of cyber victimization and cyberaggression. However, perceived conflicting teacher relationships increased the likelihood of cyber victimization ($p<0.05$) and cyberaggression ($p<0.01$).
Conclusion: Cyberbullying is a concern among university students, and the students' perceived nature of their relationships with their teachers and sense of virtual classroom community play a pivotal role in shaping their involvement in cyberaggression and exposure to cyber victimization. Thus, developing mass media campaigns to enhance awareness about cyberbullying and cyber civility regulations is recommended.

Keywords: Cyberbullying, Cyber-Victimization, Online Learning, University Students

Introduction

Bullying is one of the aggressive behaviors that happen in an intentional and recurring style that result in feeling hurt by others [1]. Three key characteristics define bullying: a purpose to harm, repetition, and an obvious power disparity between the bully and the victim. It does not just occur between teenagers and schoolchildren but also among adults [2,3]. Bullying involves many

Received: January 19, 2023; **Revised:** June 4, 2023; **Accepted:** June 5, 2023

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forms, either verbal, physical, sexual, social, or relational actions. Most recently, cyberbullying has been described as bullying in the digital era through various aggressive online actions [4,5].

Cyberbullying is an international epidemic rapidly spreading worldwide. Although conventional forms of bullying, such as verbal or physical abuse, are marginally down, cyberbullying is on the rise and is becoming more common. Evidence shows that the global incidence of cyber victimization is rapidly rising [3-5]. Since all students use technology and are exposed to social media platforms, cyberbullying has become an urgent and prominent issue, especially during the e-learning transformation era [6]. A recent systematic review of cyberbullying discovered that it is a widespread phenomenon: cyberaggression (1%- 41%), cyber victimization (3%-72%), and overlapping between both (2.3%-16.7%) [7]. Two recent Egyptian studies also revealed that cyberbullying victimization is a widespread problem among university students in Beni-Suef (48.2%) and EL-Fayoum (27.3%) universities [8,9].

Cyberbullying can have numerous forms, such as posting images or awkward comments about others, sending threatening messages, and distributing images through websites, blogs, instant messages, chat rooms, cell phones, electronic mail, and personal profiles. Online dating abuse and cyberstalking are two recent examples of cyberbullying conduct. Cyberbullies frequently say things they would not have the guts to say in person. They experience isolation, anonymity, and disconnection because of technology. Cyberbullying seems intrusive and never-ending to the targets of it. Bullies can harm at any time or any place and frequently do so in the comfort of their own homes. As a result, cyberbullying has serious repercussions [10,11].

Evidence shows that the victims of cyberbullying experience a significant level of psychological anguish as well as behavioral issues [12]. They exhibit greater anxiety, depression, and long-term behavioral changes, including resignation and social isolation, a preponderance of obsessive tendencies with hostile attitudes and hypersensitivity, and emotions of learned helplessness and low self-esteem [13]. When students have a bad perception of their social environment and are exposed to cyberbullying by their virtual classmates, it can lead to undesirable outcomes, including social withdrawal and even dropping out [14]. Cyberbullying in higher education negatively affects institutions and their respective stakeholders. The consequences range from staff members' turnover to student suicide [15].

The COVID-19 pandemic impacts all aspects of social life, involving the educational sphere. Since the students' previous familiarity with the learning environment has changed to a virtual classroom, a recent teaching-learning model refers to network-based learning, tele-learning, web-based learning, or e-learning. It may provide more opportunities for cyberbullying behavior and can affect the classroom climate that reflects the norms, expectations, and values that enhance the student's sense of social, emotional, and physical safety in school life [16-18]. This context creates great challenges for teachers in different educational institutions. They must be able to explore the associated changes in the student's behavior in this digital age besides guaranteeing their safety in this precarious virtual classes environment [16,19].

Student-teacher relationships also significantly influence bullying-related behaviors [20]. Literature highlights its importance in predicting involvement in different bullying roles [21,22]. Positive interactions with teachers allow the students to internalize a decent relational model that can shape other contexts and relationships, such as with peers [20,22]. Such a good relationship frequently correlates with prosocial and less aggressive behaviors and, more broadly, may foster a favorable learning environment in the classroom [20]. Cyberbullying needs critical attention where the educational sector plays a paramount role, especially during the e-learning transformation era. It can be modified using a hybrid strategy combining policy, technology, and non-technology-based solutions [23]. In addition to developing social competencies and knowledge, fostering attitudes and awareness of the potential repercussions of cyberbullying, cultivating social responsibility and enhancing the classroom climate, and developing strategies for constructive online communication [24]. A crucial step is fostering an atmosphere of online civility through establishing and putting cyber-civility regulations and standards into practice [25].

The magnitude of the study

This study is one of the pioneer studies in Egypt that handled this rising epidemic of cyberbullying (both cyber victimization and aggression) during the e-learning transformation era and COVID-19-related life changes. Thus, it provides valuable knowledge that can aid in developing targeted awareness programs about cyber-civility strategies to reduce this rising problem. Therefore, this study aimed to assess cyberbullying among university students and explore the role of the student-teacher relationship and virtual classroom environment.

Research questions

- What are the students' self-reported levels of cyberbullying (victimization & aggression)?

- What is the extent of the students' perceived virtual classroom community?
- What is the nature of the students' perceived relationship with teachers?
- How do the virtual classroom community and student-teacher relationship affect cyber victimization and aggression?
- Are there other factors affecting cyber victimization and aggression?

Methods

1. Study design

A descriptive exploratory research design was employed.

2. Participants and Setting

Participants were recruited from the four randomly selected colleges at Damanhour University/Egypt: theoretical colleges (Education and Art) and practical colleges (Nursing, Science). All the students who enrolled in the selected colleges were invited to participate in the study, both genders and were willing to contribute. A convenient sample of 600 students was included in the study using an equal allocation of 150 students from each college.

The sampling size was determined using the Steven K. Thompson formula [26] based on the average number of students in the four colleges in the academic year 2021-2022. Besides, recent evidence shows that the average proportion of cyberbullying among Egyptian university students ranges from 27.3 to 48.2 percent [8,9]. These results minimally in 533 required students, then they were upgraded to 600 to compensate for possible nonresponse.

$$n = \frac{[N \times p\,(1-p)]}{[[N-1 \times (\frac{d^2}{z^2})] + p\,(1-p)]}$$

n: Sample size (533), N: population size (≈20000), Z: Confidence level at 95.0% (1.96 Z score), d: Error proportion (0.05), and p: Probability (50%).

3. Questionnaire development

It incorporated the following parts.

Part I: Personal characteristics

Age, gender, academic year, residence, and perceived income level. Besides, awareness that bullying is punishable by law, regular accessibility of the internet, and health-related data such as chronic disease diagnosis and mental or psychological health problems.

Part II: European Cyberbullying Intervention Project Questionnaire (ECIPQ)

It was adapted from Del Rey et al. [27] and Ortega-Ruiz et al. [28] studies that aimed to investigate the validity and cross-cultural robustness of the ECIPQ. It is a self-reported measure comprised of 22 items with two domains: cyber victimization (11 items) and cyberaggression (11 items). Items were weighted on a Likert-type scale with five responses ranging from (0 = never, 1 = once or twice, 2 = once or twice a month, 3 = once a week, 4 = more than once a week) in the previous two months. The total score was calculated separately for cyberbullying and cyberaggression (0-22). Higher scores signified a higher level of the respective subscale that was further leveled as never (0), low (1-7), moderate (8-14), and high (15-22).

Part III: Rovai's Classroom Community Scale (RCCS)

It was originally developed by Rovai [29] to assess the students' perceived sense of classroom community in the virtual environment. It was further validated by Ahmady et al. [30], who revealed higher reliability for the overall scale, connectedness, and learning subscales (α = 0.87, 0.86, and 0.85). It consisted of 20 items distributed over two subscales: connectedness (10 items) and learning (10 items). Five-point Likert-type items ranged from strongly agree (0) to strongly disagree (4). The overall score was calculated (0-80), where higher scores reflected a better sense of virtual classroom community that was further leveled as poor (0-26), average (27-53), and good (54- 80). The subscales scores were also calculated (0-40), where a higher score reflected a better level of the respective domain.

Part IV: Student Version of the Teacher-Student Relationship Inventory (S-TSRI)

It was adapted from Ang et al. [31] study that aimed to develop and validate the Teacher-Student Relationship Inventory (TSRI) from students' perspective. It incorporated 14 items over three subscales: satisfaction (5 items), Instrumental help (5 items), and conflict (4 items). Items were rated on a 5-point scale: almost never true (1), seldom true (2), sometimes true (3), often true (4), and almost always true (5). The overall score was calculated (14-70), where a higher score indicated a better student-teacher relationship that was further leveled as poor (14-33), average (34-53), and good (54-70). The subscales scores were also calculated where higher scores reflected a better level of the respective domain, except for the conflict domain, the higher scores reflected conflicting student-teacher relationships.

4. Questionnaire validity and reliability

The researchers translated the scales into Arabic with another researcher's back translation (Arabic to English) to guarantee their accuracy. Six experts in the field evaluated the content validity of the questionnaire. The Content Validity Index per item level (I-CVI) ranged from 0.8 to 1.0, and the overall scale (S-CVI) was 0.91. The internal consistency reliability of the questionnaire was assured using “Cronbach’s α coefficient," which disclosed a satisfactory level: part II ($\alpha = 0.861$), part III ($\alpha = 0.827$), and part IV ($\alpha = 0.902$).

5. Administrative design

An official letter for study conduction was directed from the Dean of the nursing college to the Dean of Damanhour University. After approval, the necessary official approval to conduct the study was obtained from the designated colleges after explaining the purpose of the study.

6. Pilot study

Afterward, the questionnaire was pre-tested on 10% of the university students who were later dismissed from the main study. It was executed before data collection to review the feasibility, duration, cost, and adverse events of a full-scale research project and to enhance the study design.

7. Data collection

The researchers designed a digital self-administered constructed questionnaire using Microsoft Team forms. We invited undergraduate students enrolled in Damanhour University to participate in the study. They were invited via emails and official university platforms on social media profiles (WhatsApp and Facebook). Consequently, the online questionnaire was available from February 1st to March 30th, 2022. Reminder messages were sent twice a week to those who did not respond for three consecutive weeks.

8. Ethical Considerations

The study’s ethical approval was gained from the research ethics committee of the Faculty of Nursing, Damanhour University (No. 22-1-202252e). The data were anonymously collected, kept confidential, and used for research purposes only. The consent form explained the background of the study, outlined the confidentiality procedures, and explained how the participant was free to withdraw from the survey at any time. It appeared on the very first screen of the survey. The participant read through the consent form and had to click 'I agree' to continue participating in the survey or 'I disagree' to withdraw from the survey. There were no identifying demographic questions asked to ensure confidentiality. Thus, there is no way for the researcher to identify who participated in the survey as it was all done anonymously online. The survey was distributed through an anonymous survey link with no identifying information, such as email addresses, to be collected.

9. Statistical Analysis

The data was coded and entered in the “Statistical Package of Social Sciences” “SPSS Inc; version 24; IBM Corp., Armonk, NY, USA”. After data entry, it was explored to detect any error; then, it was analyzed by the same program for presenting frequency tables with percentages. Qualitative data was shown as numbers and percentages, while quantitative data were represented as mean/SD. Spearman correlation (r) was executed to guarantee the strength of a linear relationship between ordinal variables, and a t-test was performed to evaluate multiple linear regressions. Two linear regression models were utilized to investigate the factors affecting cyber victimization and cyberaggression. Both models were assessed for potential multi-collinearity using the Variance Inflation Factor ($VIF < 10$), and the adjusted R^2 value determined their goodness of fit. The Tolerance level ($1 - R^2$) was set at 0.50 or more to ensure that none of the independent variables can be predicted by the others in the model. The Quantile-Quantile (Q-Q) plot we used to ensure that the models' residuals were normally distributed, while a scatter plot was used to ensure the linear relationship between factors involved in each model and either cyber victimization or cyberaggression. The Durbin-Watson test was also employed to ensure the independence of residuals/observations or to exclude autocorrelation. Moreover, homoscedasticity was judged using a scatter plot of residuals versus predicted values to confirm the absence of a clear pattern in the distribution. The results were considered statistically significant at $p \leq 0.05$.

Results

1. Personal characteristics of the students

Table 1 displays that 45.5% of the students aged between 20-21 years, 51.0% were females, and 40.2% were enrolled in the first academic year. More than half (56.5%) were rural residents, and 48.8% had enough income for basic needs. In addition, 82.8% of them used the internet regularly, and 80.8% did not know bullying is punishable by law. Finally, 69.7% of the students did not have physical or psychological health problems.

Table 1. Distribution of the Students According to Their Personal Characteristics (*N*=600)

Items	n	%
Age (Years)		
18-19	228	38.0
20-21	273	45.5
22-23	99	16.5
Gender		
Male	294	49.0
Female	306	51.0
Academic year		
First	241	40.2
Second	143	23.8
Third	117	19.5
Fourth	99	16.5
Residence		
Rural	339	56.5
Urban	261	43.5
Perceived income level		
Enough for basic needs	293	48.8
Enough for basic and secondary needs	191	31.8
Enough and save.	91	15.2
Not enough	25	4.2
Having regular internet access		
Yes	497	82.8
No	103	17.2
Knowing that bullying is punishable by law		
Yes	115	19.2
No	485	80.8
Having a physical or psychological health problem		
Yes	182	30.3
No	418	69.7

2. Scale items mean scores and total scores of all the studied variables

Table 2 illustrates that the highest mean score items of cyber victimization were being exposed to nasty things and names personally 0.41 ± 0.03, or in public 0.50 ± 0.02, and being excluded or ignored by others on social networking sites and chat rooms 0.38 ± 0.01. Regarding the cyberaggression items, the highest mean score items were ignoring others on social networking sites and chat rooms 0.32 ± 0.02, saying nasty things and names about others 0.13 ± 0.01, and creating a fake account pretending to be someone else 0.10 ± 0.01.

Table 3 shows that the lowest mean value for connectedness items was 2.64 ± 0.76 for not feeling a spirit of community in the class, whereas the highest mean value was 3.58 ± 1.07 for feeling confident with receiving support from others. Moreover, the lowest mean value for the learning items was 2.5 ± 0.97 for feeling hard to get help when having a question while the highest mean value was 3.66 ± 0.74 for receiving timely feedback.

Table 2. Mean Scores of The Cyber Victimization and Cyberaggression Items (European Cyberbullying Intervention Project Questionnaire (ECIPQ) scale)

Items	Mean ± SD
Cyber victimization	
- Personal online exposure to nasty things and/or names	0.41 ± 0.03
- Public online exposure to nasty things	0.50 ± 0.02
- Exposure to online threatening	0.23 ± 0.02
- Hacking account and stealing personal information	0.23 ± 0.01
- Hacking account by someone who pretends as the owner	0.19 ± 0.01
- Online posting of personal information by someone	0.15 ± 0.01
- Online posting of embarrassing videos or pictures	0.13 ± 0.01
- Manipulation of posted pictures or videos by someone	0.06 ± 0.01
- Being excluded from online social networks or chat rooms	0.38 ± 0.01
- Spreading of online rumors	0.06 ± 0.02
Cyberaggression	
- Saying nasty things or names to others	0.09 ± 0.01
- Saying nasty things about others	0.13 ± 0.01
- Threatening someone	0.04 ± 0.02
- Hacking into someone’s account and stealing his personal information	0.06 ± 0.01
- Hacking into someone's account and pretending to be him	0.03 ± 0.03
- Creating a fake account pretending to be someone else	0.10 ± 0.01
- Online posting of personal information about someone	0.05 ± 0.01
- Online posting of embarrassing videos or pictures of someone	0.04 ± 0.01
- Manipulation of online posted pictures or videos of another person	0.02 ± 0.01
- Excluding someone from a social network or chat room	0.32 ± 0.02
- Spreading online rumors about someone	0.02 ± 0.01

Table 4 represents that the highest mean value for satisfaction items was 4.17 ± 1.33 for the item "Like the teacher," while the highest mean value for instrumental help items was 3.18 ± 0.35 for "When needing help, it is likely to go to the teacher." However, the highest mean value for the conflict items was 2.20 ± 0.34: "Cannot wait for this year to be over because lack of desire to be with this teacher again."

Table 5 reveals that 66.5% of the students reported low cyber victimization, while 39.8% reported being involved in low cyberaggression behaviors. The highest percent of the students had average scores of classroom connectedness (77.3%), learning experience (70.3%), and overall RCCS (80.8%). Moreover, most (82.3%) of the students had good satisfaction levels, perceived

Table 3. Mean Scores of the Rovai's Classroom Community Scale (RCCS) Items

Items	Mean ± SD
Connectedness items - The student's feelings………	
- Students in this class care about each other	3.41 ± 1.02
- Connected to others in this class	3.32 ± 0.98
- Not having a spirit of community	2.64 ± 0.76
- This class is like a family	3.23 ± 1.13
- Isolated in this class	2.63 ± 0.81
- Trust others in this class	3.47 ± 0.55
- Being able to rely on others in this class	3.08 ± 1.04
- Members of this class are dependent	3.49 ± 1.33
- Uncertain about others in this class	2.78 ± 0.65
- Confident in receiving support from others	3.58 ± 1.07
Learning items - The student's experience………	
- Being encouraged to ask questions	3.35 ± 1.44
- Hardness to get help when having a question	2.50 ± 0.97
- Receiving timely feedback	3.66 ± 0.74
- Uneasy to reveal gaps in understanding	3.34 ± 1.23
- Reluctant to speak openly	3.10 ± 1.01
- This class results in only modest learning	2.89 ± 0.73
- Other students do not offer help to learn	2.65 ± 0.47
- Given opportunities to gain experience	3.55 ± 1.02
- The educational needs are not being met	2.90 ± 0.48
- This class does not encourage the desire to learn	2.85 ± 0.27

Table 4. Mean Scores of the Student Version of The Teacher-Student Relationship Inventory (S-TSRI) Items

Items	Mean ± SD
Satisfaction	
- Enjoying attendance of this teacher's class.	3.86 ± 1.09
- Having a positive relationship with the teacher	4.03 ± 2.10
- Feel missing if the teacher retires or leaves the school	4.01 ± 1.61
- Feel happy with the teacher relationship.	4.09 ± 0.92
- Like the teacher.	4.17 ± 1.33
Instrumental help	
- When having a home problem, it is possible to ask for help from the teacher	2.45 ± 0.74
- Sharing personal life issues with the teacher.	2.13 ± 0.65
- When needing help, it is likely to go to the teacher.	3.18 ± 0.35
- Discuss personal feelings and thoughts with the teacher	2.66 ± 0.41
- Depending on the teacher for advice.	3.03 ± 0.64
Conflict	
- The teacher can be the source of frustration many times	2.01 ± 0.27
- Cannot wait for this year to be over because lack of desire to be with this teacher again.	2.20 ± 0.34
- Feeling more relief if the teacher is absent	2.16 ± 0.18
- Enjoying class more if another replaces this teacher	2.17 ± 0.34

Table 5. Distribution of the Studied Students According to Total Scores of The Studied Variable (*N*=600)

Items	n	%
Cyber victimization		
Never	201	33.5
Low	399	66.5
Cyberaggression		
Never	361	60.2
Low	239	39.8
Total RCCS Score†		
Good	88	14.7
Average	485	80.8
Poor	27	4.5
Connectedness scale		
Good	83	13.8
Average	464	77.3
Poor	53	8.9
Learning scale		
Good	147	24.5
Average	422	70.3
Poor	31	5.2
Total S-STRI Score‡		
Good	113	18.8
Average	423	70.5
Poor	64	10.8
Satisfaction		
High	493	82.2
Average	89	14.8
Low	18	3.0
Instrumental help		
High	152	25.4
Average	233	38.8
Low	215	35.8
Conflict		
High	79	13.2
Average	113	18.8
Low	408	68.0

†Rovai's Classroom Community

‡Student Version of The Teacher-Student Relationship Inventory

average (38.8%) and poor (35.8%) instrumental help, and 68.0% perceived poor conflict level; meanwhile, average total S-TSRI was reported by 70.5% of them.

3. Linear regression analysis of the factors affecting cyber victimization and cyberaggression

Model 1 in table 6 depicts the high significance of the model (F = 13.87, $p < .001$), which explains 67.0% of the variation in cyber victimization ($R^2 = .67$). It explained that the increasing levels of students' perceived satisfaction with their teachers relationship ($B = -0.34$, $p < 0.01$), virtual classroom connectedness ($B = -0.31$, $p < 0.01$), total S-STRI scores ($B = -0.30$, $p < 0.05$), instrumental help by teachers ($B = -0.28$, $p < 0.01$), learning experience ($B = -0.23$, $p < 0.05$), and total RCCS ($B = -0.20$, $p < 0.05$) decrease the likelihood of cyber victimization. However, having physical or psychological health problems ($B = 0.24$, $p < 0.05$) and regular internet access ($B = 0.22$, $p < 0.05$), female gender ($B = 0.27$, $p < 0.05$), conflicting teacher relationship ($B = 0.20$, $p < 0.05$), and lower age ($B = 0.17$, $p < 0.05$) increase the likelihood of cyber victimization.

Model 2 in Table 6 portrays the high significance of the model ($F = 11.78$, $p = < .001$), which explains 59.0% of the variation in cyberaggression ($R^2 = .59$). It revealed that higher scores of the total S-STRI score ($B = -0.40$, $p < 0.01$), classroom connectedness ($B = -0.31$, $p < 0.01$), instrumental help by teachers ($B = -0.28$, $p < 0.05$), knowing that bullying is punishable by law ($B = -0.26$, $p < 0.05$), total RCCS scores ($B = -0.24$, $p < 0.05$), learning experience and satisfying teacher relationship ($B = -0.20$, $p < 0.05$) decrease the likelihood of cyberaggression. However, conflicting teacher relationship ($B = 0.30$, $p < 0.01$), having regular internet access ($B = 0.27$, $p < 0.05$), experiencing cyber victimization ($B = 0.25$, $p < 0.05$), higher age ($B = 0.20$, $p < 0.05$), male gender ($B = 0.17$, $p < 0.05$) increase the likelihood of cyberaggression.

Discussion

The current study revealed that almost two-thirds (66.5%) of the students were victims of cyberbullying, mainly through personal or public exposure to nasty things and/or names and exclusion by others on social networking sites and chat rooms. More-

Table 6. Multiple Linear Regression Models for Cyber Victimization and Cyberaggression

Model 1: Cyber victimization	Unstandardized Coefficients	Standardized Coefficients		
	B	β	T	*p*
Connectedness	-0.31	.26	6.22	< .001**
Learning	-0.23	.20	3.10	.025*
Total RCCS† score	-0.20	-.14	2.58	.035*
Satisfaction	-0.34	.29	6.00	< .001**
Instrument help	-0.28	.19	2.66	.014*
Conflict	0.20	.15	3.71	.029*
Total S-TSRI‡ score	-0.30	.23	5.70	.019**
Having regular Internet access	0.22	.17	4.10	.038*
Lower age	0.17	.11	3.46	.032*
Female gender	0.27	.19	3.19	.040*
Having a physical or psychological health problem	0.24	.19	4.36	< .001**
Model significance	R^2 (.67)	F (13.87)	*p* (< .001**)	
Model 2: Cyberaggression	Unstandardized Coefficients	Standardized Coefficients		
	B	β	T	*p*
Connectedness	-0.31	.25	6.00	< .001**
Learning	-0.20	.16	2.45	.015*
Total RCCS score	-0.23	.18	2.77	.023*
Satisfaction	-0.20	.27	2.90	.013*
Instrument help	-0.28	.19	2.66	.011*
Conflict	0.30	.25	5.89	< .001**
Total S-STRI score	-0.40	.30	6.09	< .001**
Increased age	0.20	.10	2.46	.034*
Male gender	0.17	.09	2.19	.018*
Knowing that bullying is punishable by law	-0.26	.18	3.16	.021*
Having regular internet access	0.27	.20	3.77	< .028*
Cyber victimization	0.25	.18	3.44	< .017*
Model significance	R^2 (.59)	F (11.78)	*p* (< .001**)	

†Rovai's Classroom Community; ‡Student Version of The Teacher-Student Relationship Inventory; *$p < 0.05$; **$p < 0.01$

over, nearly two-fifths (39.8%) of the students were cyberbullies. The frequently reported bullying behaviors were ignoring others on social networking sites and chat rooms, saying nasty things and names about others, and creating a fake account pretending to be someone else. Besides, being exposed to cyber victimization proved to increase the likelihood of involvement on cyberaggression behaviors. Therefore, the victims of cyberbullying have a higher tendency to cyberbully others, which necessitates urgent action to cut down on this rising phenomenon.

In accordance, a recent Saudi study by Ali & Shahbuddin [32] portrayed that nearly half (49.1%) of the studied college students have been cyberbullied, and the rest (50.9%) never experienced cyberbullying. Yudes et al. [33] depicted that nearly a quarter of the studied Spanish students was involved in cyberbullying activities, where the most frequent behaviors were online insults and social exclusion. Two Egyptian studies reported that cyber victimization is prevalent among college students, especially females. The first was at El-Fayoum University by Hassan et al. [8], who showed that more than a quarter of the studied nursing and non-nursing students experienced cyberbullying. The second was by Arafa & Senosy [9], who revealed that nearly half of the students were victims of cyberbullying. Moreover, an almost equal cyber victimization percentage (66.0%) among those in the current study was reported by Lai et al. [34] among Malaysian university students.

A lower trend of cyber victimization than the current study among college students in the US was reported by Webber and Ovedovitz [35], where 4.3% reported being exposed to cyberbullying at the university level. However, 7.5% reported participation in cyberbullying behaviors using different platforms, including Facebook, Twitter, texting, email, Instagram, Snapshot, and chat rooms. Moreover, a survey conducted by Johnson et al [36] among undergraduate students in the US revealed that 73.6% reported never being victims of cyberbullying, and nearly a quarter of them reported being victims of cyberbullying. The findings also signified that most students never cyberbullied others, and a minority reported cyberbullying once a month. This lower trend can be explained by the ecological factors involved in cyberbullying that differ between and even within countries. Besides, the e-learning transformation during the COVID-19 era as both studies was conducted before the pandemic.

The current study explored that most students had an average sense of the virtual classroom community with an average sense of connectedness and learning experience. It also explored that the better the students' perceived level of virtual classroom connectedness, learning experience, and the overall virtual classroom climate, the lower the likelihood of cyber victimization and cyberaggression. Thus, the supportive virtual class environment played an essential role in protecting the students from being victims of cyberbullying or perpetrators.

In agreement, Thornberg et al. [37] showed that students are less prone to be victims or bullies than uninvolved if they pertain to a more positive, caring, and supportive class climate. Numerous studies have also shown classroom climate has a positive role in diminishing cyberbullying and victimization [38,39]. Moreover, Yang et al. [19] reported an inverse association between self-management and cyber victimization, strengthening with a more positively perceived school climate. Moreover, Aizenkot and Kashy-Rosenbaum [40] and Ferrer-Cascales et al. [41] indicated the efficacy of anti-cyberbullying intervention programs in reducing cyberbullying and victimization and improving student sense of class climate belonging. The former conducted a WhatsApp-based intervention, while the latter conducted a peer tutoring program. Therefore, the anti-cyberbullying intervention program is highly recommended to improve socio-emotional aspects in the classroom.

The present study revealed that the highest percentage of the students reported average overall student-teacher relationships with high satisfaction levels, average instrumental help, and low conflict. It also proved that the better the students' perceived quality of relationship with their teachers, sense of satisfaction, and instrumental help, the lower the likelihood of cyber victimization and cyberaggression. In converse, the higher the rate of perceived conflicting relationship with the teacher, the higher the rate of both. Henceforth, the teachers have a pivotal role in protecting students from committing or being victims of cyberbullying through the internalized values acquired by the students from their model teachers.

Conveniently, a Chinese study during COVID-19 by Ye et al. [42] demonstrated that the student-teacher relationship moderated the relationship between cyberbullying and mental health and difficulties with online learning and academic engagement. A Brazilian study by Valle et al. [43] reported that bullying had a direct negative influence on school engagement while the teacher-student relationship had a direct positive influence on school engagement. Besides, it elaborates that a good teacher-student relationship significantly mediates the adverse effect of bullying victimization and perpetration on school engagement levels. Therefore, a positive relationship between students and teachers translates into better school engagement, while a conflicting relationship translates into lower school engagement levels. Similarly, several studies demonstrate that conflicting student-teacher relationships are associated with an increased risk of bullying victimization [22,44].

Moreover, evidence about teachers' mediation interventions shows their effectiveness in decreasing cyberbullying by providing emotional warmth to support students' disengagement from online activities [45,46]. Interventions reinforcing social support can create positive relations, interpersonal skills, and prosocial behaviors that can help decrease cyberbullying [47,48]. So, the joined work of different agents (e.g., psychologists, teachers, parents, peers) should be considered to promote a positive evolution in cyberbullying prevention.

The current study explored additional factors that can affect cyberbullying. Having physical or psychological health problems, regular internet access, lower age, and female gender increased the likelihood of cyber victimization. Moreover, the likelihood of cyber aggression was increased by being exposed to cyber victimization, having regular internet access, male gender, and higher age, whereas it was decreased by being aware that bullying is punishable by law. These findings illustrate the multidimensional influences on cyberbullying as a social phenomenon while highlighting the role of laws and policies in regulating such a social disorder.

Similar findings were revealed by Zhong et al. [49], who indicated that Chinese male college students are more likely to cyberbully others. Besides, the students with regular Internet access differ significantly regarding cyberbullying. Lai et al. [34] reported a higher rate of cyber victimization among Malaysian female college students. However, no gender differences in cyber victimization rates have been reported by many studies [50,51]. These conflicting findings may be attributed to the differences in the sample size, age, socioeconomic status, and instruments used to measure cyber victimization.

Moreover, Bennett and Ramos [51] and Rezk El Khateeb et al. [52] found that adolescents commonly participate in cyberbullying behavior as both perpetrators and victims. They found that the number of cyberbullying cases and effects increased with age and a lack of knowledge Moreover, Llorent et al. [53] reported an increasing relationship between academic level and cyber victimization in high school and university adolescents. Lastly, Yudes et al. [33] depicted that cyberbullying perpetration was predicted through higher age, male gender, cyber victimization, Internet use, poor emotional regulation, and lack of parental control.

Conclusion

The current study concluded that almost two-thirds of the students reported low cyber victimization and nearly two-fifths were involved in low cyberaggression behaviors. Most students reported an average sense of the virtual class community with average connectedness and learning experience. Moreover, most students had an average relationship with their teachers, with high satisfaction, average instrumental help, and low conflict.

The likelihood of cyber victimization and aggression was significantly decreased by the perceived higher quality of the overall student-teacher relationship scale and its two domains (satisfaction and instrumental help), besides the higher perceived sense of virtual classroom climate and its domains (connectedness and learning experience). However, their likelihood was significantly increased by the students' perceived conflicting teacher relationship and having regular internet access. Moreover, the likelihood of cyber victimization increased by having physical or psychological health problems, being lower age, and being female. Finally, the likelihood of cyber aggression was increased by higher age and male gender, whereas it was decreased by knowing that bullying is punishable by law.

Thus, based on these findings, the authors suggested that the Ministry of higher education and Colleges should develop the cyberbullying policy and effectively communicate it to students and staff members; develop mass media campaigns to enhance awareness about cyberbullying, its code of conduct, law, and cyber civility regulations and standards; develop and implement internet etiquette training programs to help students discriminate between proper and improper behaviors; design and implement educational programs for staff/teachers to strengthen their relationship with students.

Strengths and limitations

This study is one of the pioneer studies in Egypt that handle cyberbullying, categorizing both cyber victimization and aggression during the e-learning transformation era. Besides, assessing the role of the virtual classroom community and the role of teachers' relationship. However, one of the limitations is that this study was conducted in one university; we recommend replicating this study in several Egyptian universities to capture a holistic picture of cyberbullying among this critical age group.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Author contributions

Sayed, Samiha contributed to conceptualization, methodology, writing - original draft, review & editing, and validation. AbuElEla, Lucy contributed to data curation, project administration, visualization, writing - review & editing, resources, software, and supervision. Sarhan, Ahlam contributed to project administration, writing - review & editing, investigation, resources, software, and supervision. El Demerdash, Doaa contributed to conceptualization, data curation, formal analysis, visualization, writing - review & editing, and investigation.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

A grant thanks to all students who participated in this study.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):147-157
https://doi.org/10.12799/rcphn.2023.00066

What Determines the Health-related Quality of Life of Vietnamese Migrant Workers in Korea?

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Purpose: Over time, the number of migrant workers in Korea has shown a steady increase. Notably, among all migrant workers, those from Vietnam constitute the third largest group in Korea. The main objective of this study was to investigate the factors that influence the health-related quality of life of Vietnamese migrant workers. The study aimed to provide essential data for the development of customized nursing intervention programs and policy preparation in the future.
Methods: A total of 220 Vietnamese migrant workers aged between 18 and 64, who were employed in Korea through the Employment Permit System and had been residing in the country for more than 91 days, participated in this study.
Results: The study results revealed that physical activity (β=.19, p=.002), hope (β=.50, p <. 001), cohabitation with colleagues (β=.16, p =.003), and sleep hour (β=.11, p =. 031) had a statistically significant impact on health-related quality of life. The findings showed that higher levels of physical activity and hope were positively associated with higher health-related quality of life. Moreover, cohabiting with colleagues and sleeping for more than six hours were also significantly related to higher health-related quality of life.
Conclusion: Given these findings, it is imperative to develop programs that encourage physical activity and enhance the health-related quality of life of migrant workers from Vietnam. Policymakers and employers should also consider providing adequate living conditions that facilitate cohabitation with colleagues and sufficient time for sleep to improve the health and well-being of migrant workers.

Keywords: Health; Quality of Life; Migrants; Work

Introduction

Korea is currently facing a serious workforce shortage in the industrial field, particularly in the small and medium-sized manufacturing, agricultural, and livestock industries. In response to the acute labor shortage since 2004, migrant workers have received an employment permit from the Korean government through the Employment Permit System (EPS). This system allows the legal employment of non-professional migrant workers [1]. Furthermore, to resolve the serious labor shortage caused by the lack of workers after COVID-19, the government has issued employment permits to several migrant workers. According to predictions by the EPS [1], the number of migrant workers is expected to reach 110,000 by 2023, which would be the highest number of migrant workers since the implementation of the EPS. The proportion of migrant workers in Korea continues to increase.

As of October 2022, among the 16 countries that participate in the EPS in Korea, Vietnam has the third-largest number of migrant workers with a total of 29,340 workers, following Cambodia and Nepal [2]. Migrant workers from Vietnam face difficulties in finding stable employment opportunities in their home country, which often results in a high rate of illegal stays [3]. This situation is exacerbated by the significant wage gap between Korea and Vietnam. Although they seek better economic opportunities in Korea, these workers still face economic hardships while working in the country [3]. Korea is known as the country most

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Received: February 5, 2023; **Revised:** June 8, 2023; **Accepted:** June 9, 2023
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preferred by Vietnamese workers because of its high wages and good working conditions; therefore, the number of migrant workers from Vietnam is expected to increase. However, most of them are engaged in simple tasks that domestic workers avoid. They also experience many conflicts and difficulties adapting to the industrial field due to the environment being different from their home country's culture [4].

In addition, although the EPS does not discriminate against Koreans in the application of the Labor Standards Act, Industrial Accident Compensation Insurance, and the Minimum Wage Act, the reality is that they are not well observed in the field [5]. The same is true for the national health insurance system, which is directly related to a person's right to health. With the revision of the Enforcement Decree of the National Health Insurance Act in 2019, it became mandatory for migrants staying in Korea for more than six months to subscribe to local health insurance, thereby increasing the rate of migrant national health insurance subscriptions. Local subscribers in Korea may find it challenging to determine how their domestic income and assets are used to calculate insurance premiums. Meanwhile, migrant workers face a significant economic burden due to the requirement of paying the average insurance premium if the national health insurance subscription rate for the previous year is lower than the average [6]. Migrant workers experience high stress in the process of moving and adapting to unfamiliar environments and are threatened by risk factors such as poor working conditions. Health is important not only in itself but also because it affects health related quality of life (HRQoL). HRQoL is a subjective and multidimensional construct that refers to individuals' or groups' physical and mental health over time [7].

According to reports, studies have indicated that the HRQoL among migrant workers is relatively moderate, with a score of 61.09 out of 100 [8]. Several previous studies have identified factors that affect the HRQoL of migrant workers. For instance, leaving one's home country to work as a migrant in a foreign country can have negative impacts on the migrant's HRQoL, such as depression and stress associated with adapting to a new culture [9,10]. In addition, occupational stress [11], experienced as a worker while facing a new job that they have not experienced in their home country, also negatively impacts HRQoL. On the other hand, higher self-efficacy and health-promoting behaviors, such as physical activity, were confirmed to positively affect HRQoL [12]. Moreover, social interaction with others through social support positively affects HRQoL through psychological stability; the better the Korean language ability, the higher the HRQoL score [10]. In particular, research confirmed that hope, which can serve as a strong protective mechanism that gives meaning and satisfaction to life in a difficult environment, positively affects HRQoL [13].

As the number of migrant workers is expected to increase in Korea, it is necessary to recognize that migrant workers are members of Korean society; they must lead healthy lives to maximize productivity in their workplace and improve individual satisfaction with life. Despite existing studies on Vietnamese migrant workers that have explored acculturative stress and occupational stress [9,11], few have examined these workers from a comprehensive perspective to identify factors that affect their HRQoL.

Hence, this study was conducted to provide fundamental data for the development of nursing intervention programs and national policies for migrant workers. By identifying the factors that influence HRQoL for Vietnamese migrant workers - who constitute a significant proportion of migrant workers in Korea and are expected to continue increasing in number - the study aims to facilitate the development of effective interventions and policies to support the health and well-being of these workers.

Methods

1. Study design

This study is a descriptive research study to identify the factors affecting the HRQoL of Vietnamese migrant workers

2. Participants

We conducted convenience sampling on Vietnamese workers employed in Korea on non-professional employment (E-9) visas through the EPS. The specific selection criteria for participants were: adults between 18 and 64 years who are migrant workers from Vietnam and residing in Korea for more than 91 days; this is the standard number of days for long-term migrants following the legislation proposed by Korean Ministry of Justice. We excluded women who migrated for marriage, students who migrated for study, and migrants residing in Korea for tourism.

This study based its minimum number of samples on a previous study [10], wherein the significance level is α = .05, the effect size medium is .15, and the power is .90. The number of predictors by the multiple regression analysis statistical method is based on the G * Power 3.1 Program calculation standard. Based on the estimation that the number of predictors is 8, the required sample size for this study was calculated to be 136 participants. Considering a dropout rate of 20% [10], the final required sample size was 170. For data collection, we distributed 250 copies of the structured questionnaire, anticipating a lower response rate due to the respondents' unfamiliarity with the survey. We received 231 responses, resulting in a response rate of 92.4%. Of these, we used 220 for the final data analysis, excluding 11 copies with insincere responses.

3. Measurements

(1) Health-related Quality of life

We measured HRQoL using the WHOQOL-BREF [14] developed by the World Health Organization (WHO). WHOQOL-BREF uses a 5-point Likert scale ranging from 'very poor', 'very dissatisfied', 'not at all', 'never' (1 point) to 'very good', 'very satisfied', 'an extreme amount', 'extremely', 'completely', 'always' (5 points), depending on the item. The WHOQOL-BREF consists of a total of 26 questions in 4 area domains such as physical health, psychological, social relationship, and environment domain. Items corresponding to negative questions were inversely converted; the higher score, the higher the HRQoL. The reliability of the tool during its development was assessed using Cronbach's α, which ranged from .66 to .82 across domains. In this study, the Cronbach's α values for each domain ranged from .56 to .84, and the overall reliability was .88

(2) Depression

We measured depression using the Center for Epidemiological Studies Depression Revised(CESD-R), a revision of the existing CESD [15]. The CESD-R is a total of 20 questions, depending on whether symptoms were present for two weeks. 'Not at all or less than one day' (0 point), '1-2 days' (1 point), '3-4 days' (2 points), '5-7days' (3 points), 'Nearly every day for 2 weeks' (3 points). It consists of a 5-point Likert scale ranging from 0 point for '1~2days' to 3 points for '5~7 days' and 'nearly

every day for 2 weeks'. To maintain consistency with the original version of the CESD score, the top two response values were assigned the same value, ensuring that they fall within the same range. The higher score indicating a higher level of depression. The reliability of the tool was a Cronbach's α of .93 at the time of development. In this study, the Cronbach's α was .92

(3) Physical activity

We used eight questions related to physical activity from the Health Promotion Lifestyle Profile II to measure physical activity [16]. Each item was rated on a 4-point Likert scale ranging from 'never' (1 point) to 'routinely' (4 points). The higher score indicating more physical activity. The reliability of the tool's physical activity was a Cronbach's α of .81 during its development. In this study, the Cronbach's α was .86

(4) Occupational stress

We measured occupational stress using the Korean Occupational Stress Scale-Short Form (KOSS-SF), used in a study by Chang et al. [17]. The KOSS-SF consists of 24 questions which were measured on a 4-point Likert scale ranging from 'not at all' (1 point) to 'very true' (4 points). Items of the negative questions were inversely converted; the higher scores indicating higher occupational stress. The reliability of the tool was a Cronbach's α of .93 at the time of development. In this study, the Cronbach's α was .87

(5) Acculturative stress

We measured acculturative stress using the Acculturation Stress Scale [18]. It consists of 13 questions, four about discrimination experience, three about language conflict, and six about legal status. Each item was measured on a 5-point Likert scale ranging from 'never' (1 point) to 'most of the time' (5 points). The higher score, the higher acculturation stress.

The reliability of the tool was a Cronbach's α of .65~.79 by domain Alderete's study [18]. In this study, the Cronbach's α was . 72~.87.

(6) Self-efficacy

We measured self-efficacy using the general self-efficacy tool developed by Schwarzer and Jerusalem [19]. It consisted of 10 questions which were measured on a 4-point Likert scale ranging from 'not at all true' (1 point) to 'exactly true' (4 points). The higher scores indicating higher self-efficacy. The reliability of the tool was a Cronbach's α of .76 at the time of development. In this study, the Cronbach's α was .80

(7) Hope

We measured hope using the Adult Hope Scale (AHS) developed by Snyder et al. [20]. The AHS consists of four agency subscale, four pathways subscale, and 4 items are fillers. Each item was rated on an 8-point Likert scale ranging from 'definitely false' (1 point) to 'definitely true' (8 points). The higher scores indicating greater hope. The reliability of the tool was a Cronbach's α of .86 at the time of development. In this study, the Cronbach's α was .89

(8) Social support

We measured social support using the Multidimensional Scale of Perceived Social Support (MSPSS) [21]. The MSPSS consists of support from significant other subscale, family subscale, and friend subscale, with a total of 12 items consisting of four items each. Each item was measured on a 7-point Likert scale ranging from 'very strongly disagree' (1 point) to 'very strongly agree' (7 points). The higher score indicating a higher level of social support. The reliability of the tool was a Cronbach's α of .88 at the time of development. In this study, the Cronbach's α was .93.

(9) Korean proficiency

We measured Korean proficiency by applying the measurement tool used in the Health and Medical Survey of Migrant Workers [22]. Each area of Korean speaking, listening, reading, and writing was rated using a 5-point Likert scale ranging from 'very proficient' (5 points) to 'very poor' (1 point). The higher scores indicating higher levels of Korean language proficiency. In this study, the Cronbach's α was .82

(10) General characteristics

We divided participants' general characteristics into sociodemographic, health-related, and work-related characteristics. The sociodemographic characteristics included the participants' gender, age, marital status, education, monthly income, period of residence in Korea, and cohabitation type. The health-related characteristics were included breakfast consumption, snack times per week, sleep hour per day, current smoking, drinking, health problems, current taking medication, medical insurance, and mainly used medical institution. Work-related characteristics included the participant's job, number of worker in working place, working hours per week, and the period working in Korea. The classification of each variable was determined through reference to previous studies and discussions among the researchers.

(11) Questionnaire translation and preliminary survey

All questionnaires were approved by the developer before translation. A person proficient in English and Vietnamese independently drafted a translation from English to Vietnamese. Afterward, an expert proficient in English and Vietnamese who did not participate in drafting the translation was asked to translate the Vietnamese version into English. After the translation and reverse translation were completed, the translation was reviewed by a Vietnamese researcher to evaluate whether the tool accurately reflected what it was intended to measure; then, a final draft was drawn. The WHO has approved the HRQoL tool for use in the translated Vietnamese version. Subsequently, in the expert review stage, three professors gathered for review. A preliminary survey was conducted on 10 Vietnamese people with offline and online translations to confirm the level of understanding of the questions and the time required to respond; the final translated version of the questionnaire was completed. As per the results of the preliminary survey, all questions were understood, and the response time was 20-30 minutes, with an average of 25 minutes.

4. Data collection and ethical considerations

Before data collection, this study was approved by the Institutional Review Board of Jeonbuk National University (approval number: JBNU 2020-04-022-003). We conducted online and offline data collection from July 2020 to May 2021, considering the COVID-19 pandemic. We performed online data collection by posting a recruitment notice for research participants in an online community and social networking service (SNS) wherein Vietnamese migrant workers who entered the country through the EPS were members. The applicants were asked to submit their responses to the questionnaire URL translated into Vietnamese for participation. For offline data collection, the researcher visited Vietnamese migrant workers' workplaces, migrant worker support centers, and self-help groups for Vietnamese migrant workers. The researcher explained the study's purpose, method, and procedure to the Vietnamese research assistants and provided training on the survey questions. The researcher was accompanied by a research assistant from Vietnam to explain and help the participants accurately understand the overall research process if they had any questions while filling out the questionnaire. The researcher explained the purpose of the research, confidentiality, and participants' rights to those who met the selection criteria. The researcher then distributed a self-report questionnaire after obtaining written consent from those who voluntarily agreed to participate in the study. The researcher distributed each questionnaire in an envelope, and after completing the questionnaire, the research participants were allowed to seal it themselves to maintain their confidentiality.

It took about 15-20 minutes for the participants to fill out the questionnaire, and they were allowed to ask questions at any time while filling it out. Participants were provided with a small return gift as a token of appreciation.

5. Data analysis

The collected data were analyzed using SPSS/WIN 24.0. The participants' sociodemographic, health-related, and work-related characteristics were calculated as frequency, percentage, mean, and standard deviation. Differences in HRQoL according to the characteristics of the participants were analyzed by independent t-test and one-way ANOVA. Pearson's correlation coefficients were calculated for the correlation between self-efficacy, hope, social support, Korean proficiency, physical activity, occupational stress, acculturation stress, depression, and HRQoL. The effect on HRQoL was analyzed using multiple regression analysis. Among the general characteristics, cohabitation type, breakfast consumption, sleep hour, and mainly used medical institution were identified as having a significant difference on HRQoL and were therefore selected as control variables in the study. All assumptions of multiple regression were satisfied. The Durbin-Watson index was 1.92 ($du = 1.90 < d$) and the VIF index was 1.10-2.18 (< 10), indicating no multicollinearity. The Kolmogorov-Smirnov and Koenker tests were rejected ($p = .709$ and $p = .470$, respectively), indicating normality and the same variances of the standardized residuals.

Results

1. Participants' general characteristics

Table 1 presents the participants' general characteristics. First, regarding sociodemographic characteristics, 80.0% of the participants were male and 20.0% were female. Nearly half (47.7%) were under 30 years old, while 52.3% were over 30 years old, with an average age of 30.45 ± 5.04 years old. 52.3% of the participants were married, and 47.7% were single. Most participants (94.5%) had graduated high school or attained a higher education level. In terms of monthly income, 56.4% of participants earned between 2 million won and 2.99 million won. 28.2% had lived in Korea for less than three years, while 71.8% had lived in the country for more than three years. Regarding cohabitation type, 15.4% of participants lived with family members, 52.3% lived with colleague, and 32.3% lived alone.

In terms of health-related characteristics, 87.3% of the participants reported consuming breakfast regularly, while 71.4% reported snacking less than three times per week. On average, 44.5% of participants slept less than 6 hours per day, while 55.5% slept for more than 6 hours per day. Of the participants, 42.7% reported being current smokers, and 77.3% reported drinking alcohol. In terms of diagnosed health problems, 16.8% of participants had a health problem, while 83.2% did not. Only 11.8% of participants were currently taking medication, while 88.2% were not. 69.5% of participants had medical insurance, while 30.5% did not. Furthermore, 80.9% of participants reported having a mainly used medical institution, while 19.1% did not.

In terms of work-related characteristics, 58.6% of the participants worked in the manufacturing sector, 25.9% in construction, and 15.5% in agriculture and fishing. Of the participants, 32.7% worked in organizations with fewer than 10 worker, while 67.3% worked in organizations with more than 10 employees. Regarding working hours, the majority (41.4%) worked between 41 to 51 hours per week. On average, participants worked for 46.70 ± 9.15 hours per week. As for duration of stay in Korea, 32.3% of participants had lived in Korea for less than 3 years, while 67.7% had lived in Korea for more than 3 years.

The differences in HRQoL according to participants' characteristics are presented in Table 1. Cohabitation type ($F = 3.75$, $p = .025$) showed a significant difference in HRQoL, but no significant difference was shown in the post-hoc analysis. A statistically significant difference was observed in breakfast consumption ($t = 3.18$, $p = .002$), sleep hours ($t = -3.11$, $p = .002$), and mainly used medical institutions ($t = 2.18$, $p = .031$). This suggests that participants live with family or colleagues, have breakfast, sleep for more than six hours, and mainly use medical institutions.

2. Mean Scores of Self-efficacy, Hope, Social support, Korean proficiency, Physical activity, Occupational stress, Acculturative stress, Depression, and HRQoL

Mean scores of self-efficacy, hope, social support, Korean proficiency, physical activity, occupational stress, acculturative stress, depression and HRQoL is as shown Table 2. The self-efficacy score is 2.92 ± 0.39 points (range 1-4 points), hope is 5.47 ± 1.13 points (range 1-8 points), social support is 4.99 ± 0.96 points (range 1-7 points), Korean proficiency is 2.98 ± 0.68 points (range 1-5 points), physical activity 2.53 ± 0.64 points (range 1-4 points), occupational stress 2.35 ± 0.27 points (range 1-4 points), Acculturative stress 2.85 ± 0.83 points (range 1-5 points), and depression 0.89 ± 0.83 points (range 0-3 points) and HRQoL 3.57 ± 0.45 points (range 1-5 points) (Table 2).

3. Correlations between Self-efficacy, Hope, Social support, Korean proficiency, Physical activity, Occupational stress, Acculturative stress, and Depression for HRQoL

Correlations between self-efficacy, hope, Korean proficiency, physical activity, occupational stress, acculturative stress and depression for HRQOL is as shown in Table3. HRQoL was significantly correlated with self-efficacy ($r = .42$, $p < .001$), hope ($r = .69$, $p < .001$), social support ($r = .55$, $p < .001$), Korean proficiency ($r = .21$, $p = .002$), physical activity ($r = 41$, $p < .001$), and occupational stress ($r = -.36$, $p < .001$) (Table 3).

4. Factors influencing the participants' HRQoL

Multiple regression analysis showed that physical activity ($\beta = .19$, $p = .002$), hope ($\beta = .50$, $p < .001$), cohabitation with colleagues ($\beta = .16$, $p = .003$), and sleep hour ($\beta = .11$, $p = .031$)

Table 1. General Characteristics of Participants and Differences of Health-related Quality of Life by General Characteristics of the Participants (*N*=220)

Variables	Category	n (%) or Mean ± SD	Mean ± SD	t or F (*p*)
Sociodemographic characteristics				
Gender	Male	176 (80.0)	3.56 ± 0.45	-0.65 (.516)
	Female	44 (20.0)	3.61 ± 0.42	
Age(years)	< 30	105 (47.7)	3.59 ± 0.45	0.66 (.509)
	≥ 30	115 (52.3)	3.55 ± 0.45	
		30.45 ± 5.04		
Marital status	Single	105 (47.7)	3.54 ± 0.49	-0.85 (.395)
	Married	115 (52.3)	3.59 ± 0.40	
Education	≤ Middle school	12 (5.5)	3.77 ± 0.49	1.59 (.112)
	≥ High school	208 (94.5)	3.56 ± 0.44	
Monthly income(10,000won)	< 200	62 (28.2)	3.52 ± 0.49	0.89 (.410)
	200-299	124 (56.4)	3.57 ± 0.41	
	≥ 300	34 (15.4)	3.65 ± 0.48	
Period of residence in Korea	< 3	62 (28.2)	3.62 ± 0.39	1.13 (.260)
	≥ 3	158 (71.8)	3.55 ± 0.47	
Cohabitation type	Family	34 (15.4)	3.61 ± 0.48	3.75 (.025)
	Colleague	115 (52.3)	3.63 ± 0.36	
	None	71 (32.3)	3.45 ± 0.53	
Health related characteristics				
Breakfast consumption	Yes	192 (87.3)	3.60 ± 0.43	3.18 (.002)
	No	28 (12.7)	3.32 ± 0.50	
Snack times (week)	< 3	157 (71.4)	3.56 ± 0.42	-0.62 (.534)
	≥ 3	63 (28.6)	3.60 ± 0.50	
Sleep hour (day)	< 6	98 (44.5)	3.47 ± 0.43	-3.11 (.002)
	≥ 6	122 (55.5)	3.65 ± 0.44	
Current smoking	Yes	94 (42.7)	3.59 ± 0.46	0.58 (.565)
	No	126 (57.3)	3.55 ± 0.43	
Drinking	Yes	170 (77.3)	3.55 ± 0.46	-0.99 (.323)
	No	50 (22.7)	3.62 ± 0.40	
Health problem	Yes	37 (16.8)	3.50 ± 0.55	
	No	183 (83.2)	3.58 ± 0.42	-1.07 (.284)
Current taking medication	Yes	26 (11.8)	3.53 ± 0.60	-0.46 (.645)
	No	194 (88.2)	3.57 ± 0.42	
Medical insurance	Yes	153 (69.5)	3.57 ± 0.43	0.18 (.854)
	No	67 (30.5)	3.56 ± 0.48	
Mainly used medical institution	Yes	178 (80.9)	3.60 ± 0.42	2.18 (.031)
	No	42 (19.1)	3.43 ± 0.52	
Work-related characteristics				
Job	Manufacturing	129 (58.6)	3.57 ± 0.44	0.58 (.562)
	Construction	57 (25.9)	3.59 ± 0.41	
	Agriculture and fishing	34 (15.5)	3.49 ± 0.51	
Number of worker in working place	< 10	72 (32.7)	3.61 ± 0.42	0.88 (.382)
	≥ 10	148 (67.3)	3.55 ± 0.46	
Working hours (week)	≤ 40	88 (40.0)	3.61 ± 0.47	1.19 (.305)
	41-51	91 (41.4)	3.51 ± 0.46	
	≥ 52	41 (18.6)	3.59 ± 0.33	
		46.70 ± 9.15		
Period of working in Korea (year)	< 3	71 (32.3)	3.60 ± 0.41	0.85 (.395)
	≥ 3	149 (67.7)	3.55 ± 0.46	

were confirmed to have a significant effect on HRQoL. The explanatory power of the model was 53%. Among the factors affecting HRQoL of the participants, hope (β =.50, p <.001) had the greatest effect on HRQoL (Table 4).

Discussion

The objective of this study was to identify the factors that influence the HRQoL of migrant workers from Vietnam. The level of physical activity among the participants in this study was 2.53±0.64 points (range 1-4 points), which was lower than the physical activity level of 2.64±0.82 points observed in a previous study that examined health promotion behaviors in migrant workers [10]. In general, migrant workers are highly likely to be exposed to harmful health conditions during the cultural adaptation process they undergo during migration, and a lack of physical activity can further aggravate these problems [23]. Furthermore, Vietnamese workers' average working hours per week is 46.70 ± 9.15 hours, far exceeding the 40 hours per week stipulated by the Labor Standards Act in Korea. Therefore, it is important that each workplace strictly enforces regulations on statutory working days, working hours, holidays, and break times under the Labor Standards Act. Moreover, there is a need to develop programs that can promote physical activity among migrant workers by utilizing their break time during work hours. Such interventions could include exercise programs or physical activity classes that are convenient and accessible to the workers, such as on-site programs within their company or workplace.

Table 2. Mean Scores of Self-efficacy, Hope, Social Support, Korean Proficiency, Physical Activity, Occupational Stress, Acculturative Stress, Depression and Health-related Quality of Life (*N*=220)

Variables	Range	Mean±SD
Self-efficacy	1-4	2.92±0.39
Hope	1-8	5.47±1.13
Social support	1-7	4.99±0.96
Korean proficiency	1-5	2.98±0.68
Physical activity	1-4	2.53±0.64
Occupational stress	1-4	2.35±0.27
Acculturative stress	1-5	2.85±0.83
Depression	0-3	0.89±0.83
Health related quality of life	1-5	3.57±0.45

In this study, "hope" had the greatest impact on the HRQoL of Vietnamese migrant workers. Hope is the will to achieve one's goals and the driving force to pursue human growth and the meaning of life [20]. Migrant workers experience various difficulties while living in a migrant culture and poor working conditions and environment after leaving their home country while enduring difficult circumstances. Such hope not only serves as a driving force in the lives of migrant workers but also motivates them to improve their quality of life and achieve life satisfaction [13,24]. Hope also acts as an important variable in adapting to

Table 3. Correlations between Self-efficacy, Hope, Social Support, Korean Proficiency, Physical Activity, Occupational Stress, Acculturative Stress, and Depression for Health-related Quality of Life (*N*=220)

Variables	1 r (*p*)	2 r (*p*)	3 r (*p*)	4 r (*p*)	5 r (*p*)	6 r (*p*)	7 r (*p*)	8 r (*p*)
1. Self-efficacy	1.00							
2. Hope	.53 (<.001)	1.00						
3. Social support	.49 (<.001)	.68 (<.001)	1.00					
4. Korean proficiency	.29 (<.001)	.26 (<.001)	.25 (<.001)	1.00				
5. Physical activity	.30 (<.001)	.36 (<.001)	.37 (.001)	.39 (<.001)	1.00			
6. Occupational stress	-.34 (<.001)	-.33 (<.001)	-.40 (<.001)	-.02 (.767)	-.20 (.003)	1.00		
7. Acculturative stress	-.04 (.526)	-.12 (.082)	-.13 (.063)	.16 (.018)	.27 (<.001)	.29 (<.001)	1.00	
8. Depression	.05 (.438)	-.06 (.399)	-.05 (.431)	.46 (<.001)	.25 (<.001)	.18 (.006)	.59 (<.001)	1.00
9. Health related quality of life	.42 (<.001)	.69 (<.001)	.55 (<.001)	.21 (.002)	.41 (<.001)	-.36 (.001)	-.09 (.188)	-.07 (.333)

Table 4. Factors Influencing the Participant's Health-related Quality of Life (*N*=220)

Variables	B	β	t	*p*	VIF
(Constants)	2.06		6.28	< .001	
Depression	-0.03	-.05	-0.79	.430	2.00
Physical activity	0.13	.19	3.19	.002	1.58
Acculturative stress	-0.02	-.03	-0.51	.614	1.94
Occupational stress	-0.12	-.07	-1.26	.209	1.45
Self-efficacy	0.06	.05	0.88	.380	1.57
Social support	0.04	.07	1.09	.275	2.13
Hope	0.20	.50	7.25	< .001	2.18
Korean proficiency	-0.01	-.02	-0.30	.766	1.71
Cohabitation with family[†]	0.07	.06	1.05	.295	1.33
Cohabitation with colleague[†]	0.14	.16	2.98	.003	1.32
Breakfast consumption (Yes)[†]	-0.03	-.02	-0.47	.639	1.18
Sleep hour (≥ 6)[†]	0.09	.11	2.17	.031	1.10
Mainly used medical center(Yes)[†]	0.05	.05	0.95	.344	1.10
Adj R^2 = .53, F = 19.89, $p < .001$, Durbin-Watson's d = 1.92(dU = 1.90)					
Koenker test (chi-square = 12.72, p = .470), Kolmogorov-Smirnov test (z = .70, p = .709)					

[†] Dummy variables: (Cohabitation type: None = 0, family = 1, colleague = 2), (Breakfast consumption: No = 0, Yes = 1), (Sleep hours: < 6 = 0, ≥ 6 = 1), (Mainly used medical center: No = 0, Yes = 1).

unfamiliar Korean culture [25] and promotes healthy behavior, motivating individuals to pursue it [26]. Therefore, it would be beneficial for migrant workers to support the maintenance of their hope. The most important factor that allows migrant workers to continue to have hope is economic power, that is, the wages they receive in return for their labor. Therefore, it is necessary to strengthen crackdowns and monitoring to prevent non-payment of wages or unfair deductions by employers so that migrant workers can receive stable wages while working in Korea. Furthermore, there is a need to develop hope intervention programs that both domestic and migrant workers can participate in, with the aim of maintaining hope and improving their mental health. Such programs could involve workplace support and encouragement from meaningful individuals, such as colleagues and supervisors, in order to foster a positive and supportive work environment. By enhancing hope levels among migrant workers, such interventions may help to alleviate stress and improve their HRQoL.

Living with a colleague showed a significantly higher HRQoL than living alone, which is consistent with the findings of previous studies [10]. While not statistically significant, this trend suggests that cohabitation with colleagues can positively impact the well-being of migrant workers. As most migrant workers live apart from their families for extended periods, the presence of colleagues may provide social support and a sense of companionship, which can alleviate feelings of isolation and loneliness. According to a study on migrant worker satisfaction with the EPS, only 5.2% of spouses were able to live together with their partners in Korea, but 57.3% of married migrant workers communicated with their families in their home countries almost daily via smartphones [27]. Given that family members are not permitted to accompany E-9 workers to Korea, it is likely that cohabitation with colleagues from their home countries can have a positive effect on improving HRQoL for migrant workers.

Sleep is also closely related to health; this study found that people who slept for more than six hours had a higher HRQoL than those who slept less than six hours. In addition, the group that slept less than six hours a day had a higher prevalence of dyslipidemia than the other group. A study found that the risk of metabolic syndrome was 1.56 times higher when the average sleep time was less than 6 hours than when the average sleep time was 6 hours [28]. Therefore, it is necessary to adjust working hours so that migrant workers have proper sleep time, improve the accommodation environment so that they can get proper sleep, and educate them on lifestyle habits that help them sleep.

The discussion of the participants' demographic, work-related, and health-related characteristics shown in Table 1 is as follows. Of the participants, 94.5% had an educational level of high school graduation or higher. It is presumed that this is because employers prefer those with a higher level of education as they can obtain information on their educational background when hiring migrant workers. More than half of the respondents lived with their colleagues; this may be because workers who work in places where dormitories are not provided live with their colleagues to save on housing costs. Considering the results of the 2020 migrant worker fact-finding survey [6], about half of the non-professional migrant workers were living in the dormitory provided by the company and many of them were living in the company.

Among the study participants, only 16.8% had health problems, which is thought to be because the Vietnamese migrant workers in this study had an average age of 30.45 ± 5.04 years and were relatively healthy. Hence, the prevalence of diseases was not high.

In addition, "healthy migrant effect", in which the health level of migrants appears high because relatively healthy people attempt international migration, is particularly noticeable among non-professional (E-9) workers who mainly engage in manual labor [29]. This effect may partially explain the relatively high HRQoL observed among the migrant workers in this study, as they may have been in good health before coming to Korea. However, it is important to note that migrant workers still face various health challenges, such as work-related injuries and mental health issues due to working conditions or living conditions in the new country, and may require targeted interventions to maintain their health and well-being. This study did not confirm when the participants had diseases. Still, if it can be confirmed later, it is considered useful in identifying factors that have a harmful effect on the health of migrant workers and deriving improvement points. However, the rate of drug intake among patients with diseases is low, suggesting that disease management is not properly performed. Identifying their health risk factors and preventing them from developing chronic or serious diseases is the first step toward improving their HRQoL. Therefore, it is necessary to diversify information provision methods, such as by producing and distributing guidebooks translated into Vietnamese, to encourage migrant workers in Vietnam to have regular health checkups and understand the importance of health checkups and the process and results of checkups.

The number of participants with medical insurance was low (69.5%). Migrant workers who enter Korea through the EPS are eligible for national health insurance and, in principle, are eligible for employment insurance. However, in many cases, employers do not subscribe their workers to health insurance due to indifference, while there are cases wherein some employers are not subscribed even though they have paid insurance premiums for migrant workers [30]. Therefore, each workplace must ensure that workers have been signed up for health insurance since they are legally employed through the EPS. In addition, employers must inform migrant workers that they are eligible for health insurance and actively publicize information on insurance premium reduction and support.

Migrant workers are a crucial human resource in various domestic industries, highlighting the need to prioritize their health and well-being. This study underscores the importance of identifying factors that influence the HRQoL of migrant workers and provides a foundation for developing and implementing programs that can improve their well-being. However, it is essential to note that this study has certain limitations. The participants were selected based on convenience and limited to certain regions, which limits the generalizability and interpretation of the study results. Future research should aim to address these limitations and include a broader range of participants to enhance the overall understanding of the factors that affect the HRQoL of migrant workers from Vietnam in Korea.

Conclusion

This study attempted to provide information for the development of nursing intervention programs and policy preparation for Vietnamese migrant workers, who account for the majority in Korea and are steadily increasing, by identifying the factors that affect the HRQoL of Vietnamese migrant workers. The factors influencing the HRQoL of Vietnamese migrant workers are physical activity and hope, living with colleagues, and sleeping for more than 6 hours. The higher the degree of physical activity and hope, the higher the HRQoL. In addition, HRQoL was higher when living with a colleague than when living alone and sleeping for more than six hours rather than under six hours.

Based on the findings of this study, several recommendations can be made. First, further research is needed to develop strategies and programs that can effectively increase the physical activity levels of migrant workers in Korea. This could involve the provision of on-site exercise programs during work hours or other interventions that are convenient and accessible to the workers. Second, to improve the HRQoL of migrant workers, efforts should be made to create an environment where they can live with their native friends or colleagues. This can help to reduce feelings of isolation and improve social support networks. Third, steps should be taken to ensure that migrant workers are able to get sufficient sleep, with the aim of achieving at least 6 hours of sleep per day. Finally, conducting qualitative research could provide a more in-depth understanding of the HRQoL experiences of migrant workers from Vietnam in Korea, and inform the development of targeted interventions to meet their unique needs.

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Conflict of interest

The authors declared no conflict of interest.

Funding

This work was supported by the Ministry of Education of the Republic of Korea and the National Research Foundation of Korea (NRF-2019S1A5C2A01080989).

Authors' contributions

Pahn, Jihyon contributed to conceptualization, data analysis, investigation, and writing-original draft. Kim, Heesuk contributed to investigation, and writing-original draft. Yang, Youngran contributed to conceptualization, data curation, writing-original draft, review & editing, supervision, and validation.

Data availability

Please contact the corresponding author for data availability.

Acknowledgments

This article is an addition based on the first author's doctoral dissertation from Jeonbuk National University.

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RCPHN
Research in Community and Public Health Nursing

Original Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):158-170
https://doi.org/10.12799/rcphn.2023.00101

한국 성인 남녀의 신체 표현형에 따른 대사증후군 발생 위험 평가 : 지역사회기반 코호트 자료 분석

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Assessment of Metabolic Syndrome Risk Based on Body Size Phenotype in Korean Adults: Analysis of Community-based Cohort Data

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Purpose: Body size phenotypes can be regarded as an indicator of cardiovascular incidence risk factors. The aim of this study was to investigate the incidence of metabolic syndrome among metabolically healthy adults according to body size phenotype using Korean Genome & Epidemiology Study [KoGES]-community based cohort from 2001-2002 to 2014.
Methods: A prospective population-based cohort including 5,068 adults aged 40-69 years free from metabolic syndrome was included and divided into three phenotypes: metabolically healthy normal weight (MHNW), metabolically healthy overweight (MHOW), and metabolically healthy obesity (MHO). The time dependent Cox's proportional hazards regression model was used to estimate the incidence of the metabolic syndrome after a follow-up 14 years.
Results: In the demographic, health related variables-adjusted model (Model 3), the hazard ratio of the metabolic syndrome was 1.92 (CI 1.54-2.40) for MHOW, 2.88 (CI 2.32-3.58) for MHO among males, 1.89 (CI 1.51-2.37) for MHOW, 2.34 (CI 1.88-2.90) for MHO for females compared to MHNW, respectively.
Conclusion: In conclusion, MHOW and MHO in both males and females increased the risk of metabolic syndrome compared to MHNW. Obesity management should be considered even in the absence of metabolic syndrome. Programs and resources should be provided for prevention of cardiovascular diseases and better quality of life.

Keywords: Metabolic syndrome, incidence, obesity, survival

서론

1. 연구의 필요성

세계 대사증후군 유병률은 정의에 따라 약 12.5%에서 31.4%로 지리적 위치와 경제적 수준에 따라 다양하게 보고되고 있으며[1], 우리나라 성인의 대사증후군 유병률은 2013년 22.6%에서 2018년 30.4%로 빠르게 증가하고 있다[2]. 대사증후군은 인슐린 저항성 및 복부지방의 증가된 수준, 낮은 수준의 고밀도지단백 콜레스테롤,

주요어: 대사증후군, 발생율, 비만, 생존분석
Received: February 5, 2023; **Revised:** May 25, 2023; **Accepted:** June 7, 2023

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높은 수준의 중성지방, 공복혈당장애 및 고혈압 등 신체 대사를 나타내는 핵심적인 위험인자의 군집 상태로 87개 연구에 참여한 951,083명을 대상으로 한 메타분석결과에 따르면 심뇌혈관질환 발생률을 2.35배, 심뇌혈관질환으로 인한 사망률을 2.4배 증가시킨다[3]. 대사증후군 5개 구성요소(고혈압, 고혈당, 복부비만, 고중성지방혈증, 낮은 고밀도콜레스테롤) 중 1개만 가지고 있어도 심혈관계질환과 당뇨병 발생률이 증가한다고 보고되고 있는데[4], 1개 이상 요소에서 기준치를 초과한 우리나라 인구는 2013년 71.6%(남자 77.7%, 여자 64.3%)에서 2018년 78.5%(남자 82.5%, 여자 73.6%)로 매우 심각한 수준에 있다[2].

비만은 심혈관계질환 및 암과 같은 만성 비전염성 질환의 고위험 요인으로 주요 공중 보건 문제로 장기적으로 부정적인 건강결과를 야기한다는 사실은 매우 잘 알려져 있다[5]. 그러나 동일한 정도의 비만 상태라 할지라도 개인은 혈중지질 농도, 인슐린 감수성, 혈압 및 복부비만과 같은 대사 기능에 상당한 수준의 이질성이 존재하고 있어 개인의 건강상태를 제대로 설명하지 못하는 한계가 있어 비만과 대사 건강(metabolic health)에 따라 분류하는 신체 표현형(body size phenotype) [15]에 관심이 모아지고 있다. 비만 인구의 일부 집단에서 내장 지방량과 이소성 지방 침착이 적고 유리한 대사 프로필을 가지고 있어 제2형 당뇨병과 심혈관계질환으로부터 보호되는 대사적으로 양성인 집단을 '대사적으로 건강한 비만(Metabolically Healthy Obesity, MHO)' 혹은 '양성비만(benign obesity)'으로 지칭하고 있다[6,7].

대사적으로 건강한 비만군은 높은 체질량지수를 보이지만 정상적인 인슐린 감수성, 안정된 혈압, 혈당, 지질, 염증 지표 등과 같은 대사 이상이 없어 체중 감소가 필요하지 않은 것으로 간주될 수 있지만[8,9] 시간이 지남에 따라 고혈압, 당뇨병 등의 비만과 관련된 심각한 문제를 겪게 되며 대사증후군 발생 위험도 높아 건강한 체중과 생활습관을 유지하고 대사 건강상태를 신중하게 감시하여야 한다[15]. 대사적으로 건강한 비만군을 평균 17.7년[10], 30년[11] 동안 추적 관찰한 결과, 정상체중군보다 대사적으로 건강한 비만군의 사망률 및 심혈관계질환 발생이 유의하게 증가되었다. 그런데 10년 이상 경과된 시점에서 정상체중군과 차이를 보이기 시작했으며 추적 기간이 길수록 대사적으로 건강한 비만군에 대한 위험도가 유의하게 증가하는 것을 알 수 있어 대사적으로 건강한 비만군은 대사적 위험군으로 이행하는 중간단계일 것으로 추정된다. 대사증후군 환자의 체중을 5~10% 감소시키면 예후가 상당히 개선되는 것으로 보고되고 있어[12] 대사적으로 건강한 비만군의 대사증후군 위험인자 및 이환율을 평가하여 예방하는 데 기여할 것이다.

미국 성인에서 대사적으로 건강한 비만군은 6년 후에는 대사적으로 건강한 정상체중군보다 대사증후군 발생 위험이 1.16배 높으며[13], 중국 성인에서는 7년 후 대사적으로 건강한 과체중군 1.05배, 대사적으로 건강한 비만군 1.23배 높다고 보고된 바 있다[14]. 국내 연구에서도 대사적으로 건강한 남자 비만군은 정상체중군에 비해 8년 후 대사증후군 발생 위험이 1.84배 높았고[15], 대사적으로 건강한 정상체중군은 11.1%, 대사적으로 건강한 비만군은 31.5%가 대사적으로 건강하지 않은 상태로 전환되었다[16]. 그러나, 이러한 연구들은 연구대상자가 소수이거나 8년 미만으로 추적기간이 충분하지 않고 추적 기간 동안 비만상태의 변화를 반영하지 못해 정확한 신체 표현형에 따른 대사증후군의 발생 위험 평가로는 한계가 있다.

대사증후군의 발생 위험은 유전적 요인, 생활환경 여건 등에 따라 악화 인자가 다양하므로 대사증후군을 잘 관리하기 위해서는 고위험집단의 악화 인자를 파악하여 예방적 중재와 적절한 치료적 접근을 시도하는 것이 필요하므로 전향적 코호트 연구가 필요하다[17]. 따라서, 본 연구는 국내 최장 기간인 14년간 추적 조사한 대규모 전향적 코호트 자료를 이용하여 한국 성인 남녀의 신체 표현형에 따른 대사증후군 발생 위험을 평가하여 대사증후군 예방에 필요한 기초 자료를 제공하고자 시도되었다. 특히 신체 표현형의 시간에 따른 변화를 반영하였다는 점에서 기존 연구와 큰 차별성이 있다.

2. 연구의 목적

본 연구는 한국 성인 남녀의 신체 표현형이 대사증후군 발생에 미치는 영향을 확인하기 위하여 1) 인구사회학적 및 건강관련 특성에 따른 대사증후군 발생률을 파악하고, 2) 신체 표현형에 따른 대사증후군 누적 발생률을 파악하며, 3) 신체 표현형에 따른 대사증후군의 발생 비례위험을 평가하는 것이다.

연구방법

1. 연구 설계

본 연구는 2001년부터 2002년까지의 기반조사를 시작으로 2016년까지 14년에 걸쳐 특정한 연구대상(코호트)을 2년 주기로 추적 조사된 지역사회기반 코호트 표본을 이용하여 성인 인구집단을 모집단으로 하여 신체 표현형에 따른 대사증후군 발생 위험을 평가하기 위한 전향적 코호트 표본 한국인유전체역학조사사업(Korean Genome & Epidemiology Study, KoGES) 자료를 활용한 이차분석 연구이다.

2. 연구대상 및 자료수집

1) 연구대상

본 연구는 2001년부터 2016년(7차)까지 중소도시 안산 및 농촌지역 안성에 거주하는 40~69세 남녀 주민을 중심으로 조사된 지역사회기반 코호트에 참여한 10,030명 중 기반조사에서 다음 기준을 충족하는 대상은 제외하였다. (1) 체질량지수(Body Mass Index, BMI)가 18.5kg/m^2 미만인 자(n = 179); (2) 65세 이상인 자(n = 1,256); (3) 만성질환(심근경색, 울혈성심부전, 관상동맥질환(협심증 등), 갑상선질환, 신장질환, 말초혈관질환, 뇌혈관질환) 또

는 각종 암을 의사에게 진단 받은 자(n=366); (4) 조사하고자 하는 항목에 결측치가 있는 자(n=398); (5) National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III)[21] 기준 중 3가지 이상에 해당하여 대사증후군으로 판명된 자(n=2,763)를 제외한 후 최종 5,068명의 자료를 분석에 활용하였다. 본 연구의 대상자 선정과정은 Figure 1과 같다.

2) 자료수집

한국인유전체역학조사사업은 질병관리청 국립보건연구원 유전체역학과에서 추진하는 6개 코호트 사업으로 구성되어 있으며 본 연구에서는 지역사회기반 코호트를 사용하였다. KoGES는 한국인에서 호발 주요 만성질환의 유전-환경적인 요인을 밝히고 이들 간의 상호작용을 파악 및 질병 예방을 위한 관리지침 수립을 목표로 기반조사 이후부터 2년 주기로 조사하는 국가 주도 코호트 사업이다. 지역사회기반 코호트는 10,030명을 대상으로 기반조사를 시작하여 1차 추적 8,603명, 2차 추적 7, 515명, 3차 추적 6,688명, 4차 추적 6,665명, 5차 추적 6,238명, 6차 추적 5,906명, 7차 추적 6,318명이 추적 조사되었다. KoGES 역학자료 분양 신청은 '질병보건통합관리시스템(is.cdc.go.kr)'을 통하여 연구자가 역학자료 분양 신청서, 연구계획서 및 연구윤리심의위원회 승인서(또는 면제서), 요청 변수 목록 및 역학자료 활용에 대한 동의서를 작성하여 제출한 후 담당부서 심의 후 자료분양을 받았다.

3. 연구의 변수

1) 독립변수

(1) 신체 표현형

신체 표현형은 체중과 신장을 이용해 체중(kg)/신장2(m^2)의 공식으로 체질량지수를 산출하고, 대한비만학회[18] 기준에 따라 3가지로 분류하였다[15]. 연구대상자는 모두 대사적으로 건강한 상태이므로 ① 대사적으로 건강한 정상체중(Metabolically Healthy Normal Weight, MHNW)은 BMI가 18.5 kg/m^2 이상 23 kg/m^{2}인 경우, ② 대사적으로 건강한 과체중(Metabolically Healthy Over Weight, MHOW)은 BMI가 23 kg/m^2 이상 25 kg/m^2 미만인 경우, ③ 대사적으로 건강한 비만(Metabolically Healthy Obesity, MHO)은 BMI

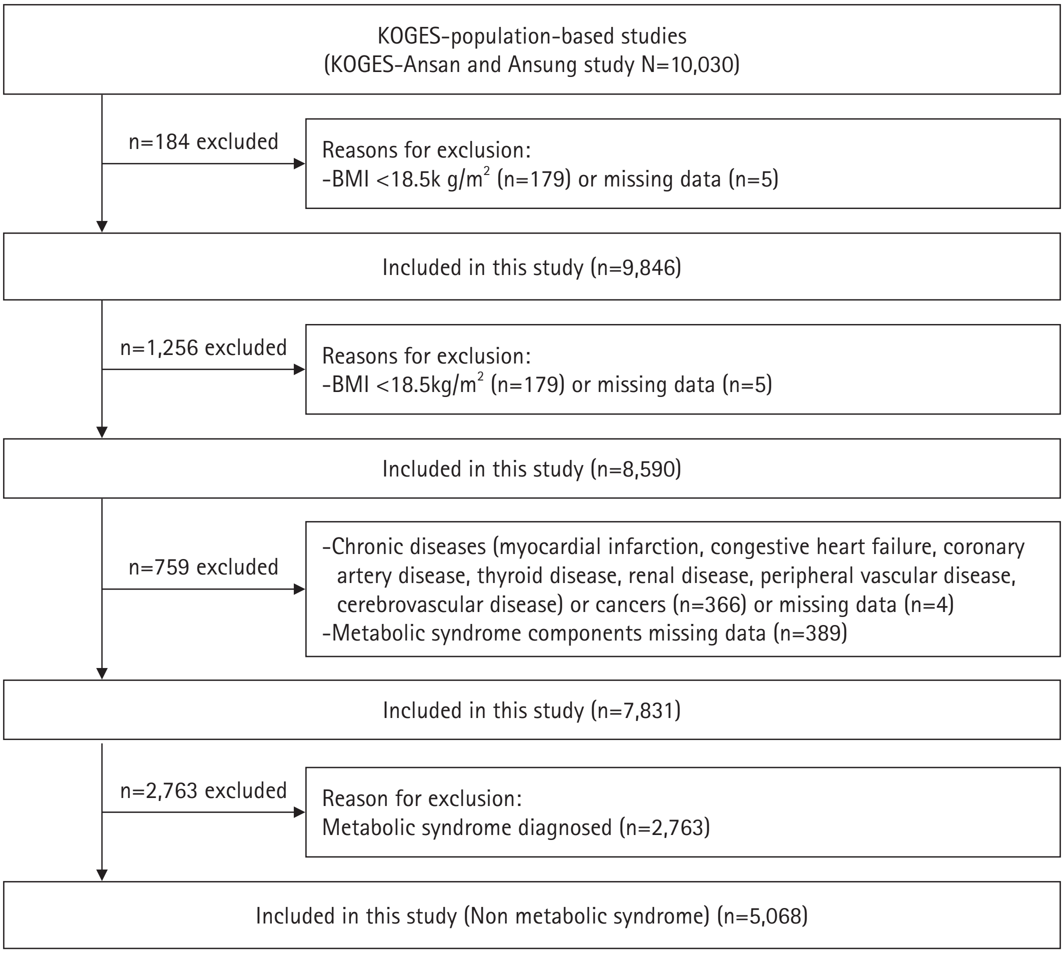


Figure 1. Flow-chart for study participants selection.

가 25 kg/m^2 이상인 경우로 하였다.

(2) 신체계측

허리둘레는 가장 아래에 위치한 늑골과 골반 장골능 상부의 중간 부위인 둘레를 줄자를 이용하여 수평으로 유지한 상태에서 0.1cm 단위까지 3회 측정된 평균값을 이용하였으며, 혈압은 미국심장협회(American Heart Association, AHA) 프로토콜에 따라 앉은 자세에서 편안한 상태로 팔을 심장 높이로 두고 수동혈압계와 청진법으로 양쪽 팔에서 두 번 측정된 수축기혈압 및 이완기혈압의 평균값을 이용하였다.

(3) 혈액분석

혈액 지표는 8시간 공복상태에서 정맥혈을 채취하여 자동분석기(ADVIA, 1800)를 이용하여 총 콜레스테롤, C-반응성 단백, 공복 인슐린, 공복 혈당, 중성지방, 고밀도지단백 콜레스테롤(High Density Lipoprotein Cholesterol, HDL-C), HbA1c(Hemoglobin A1c), 경구당부하검사(Oral Glucose Tolerance Test, OGTT)로 120분 후 증가된 포도당 농도, 비 고밀도지단백 콜레스테롤(Non High Density Lipoprotein Cholesterol, Non HDL-cholesterol)을 측정하였으며 비 고밀도지단백 콜레스테롤은 총 콜레스테롤과 고밀도지단백 콜레스테롤의 차이로 산출하였다. 인슐린 저항성에 대한 항상성 모델인 Homeostasis Model Assessment of Insulin Resistance(HOMA-IR)는 Excel의 HOMA2 계산기를 사용하여 계산하였다[19].

(4) 인구사회학적 특성

연령은 기반조사 시점을 기준으로 40~49세, 50~59세, 60~64세로 구분하였으며, 배우자 유무는 '있음(기혼, 별거, 동거)', '없음(미혼, 사별, 이혼, 기타)'으로, 직업 유무는 '있음', '없음'으로 구분하였다. 교육수준은 '고졸 이하', '대졸 이상' 범주로 구분하였으며, 소득수준은 가구의 월 평균 소득수준을 조사하여 '200만원 미만', '200~400만원 미만', '400만원 이상' 범주로 구분하였다.

(5) 건강관련 특성

주관적 건강상태는 '전반적으로 당신의 건강상태는 어떻다고 생각하십니까?'의 문항에 따라 '건강함(건강하다, 매우 건강하다)', '보통(보통이다)', '나쁨(건강하지 못하다, 매우 건강하지 못하다)'으로 구분하였으며, 피로 유무는 '최근 피로를 자주 느끼십니까?'의 문항에 따라 '예', '아니오'의 응답에 따라 이분 변수로 구분하였다. 흡연은 '지금까지 담배를 통틀어 20갑(400개피) 이상 피웠습니까?'의 문항에 따라 '비흡연', '과거 흡연', '현재 흡연'으로 구분하였으며, 음주는 '원래 술을 못 마시거나 또는 처음부터(종교적인 이유 등으로) 술을 안 마십니까?'의 문항에 따라 '비음주', '과거 음주', '현재 음주'로 재분류하였다.

신체활동 여부는 설문조사에서 1회 운동시 30분 이상이면서 주 4~5회 이상 운동 여부를 근거로 하여 '한다', '안 한다'로 구분하였다. 하루 평균 수면시간은 부족한 수면시간인 경우 '6시간 이하', 적절한 수면시간인 경우 '7~8시간', 과다한 수면시간인 경우 '9시간 이상'으로 구분하고, 하루 에너지 평균 섭취량은 식품섭취 빈도조사법(Food Frequency Questionnaire, FFQ)을 이용하여 조사하고 이를 2010년 한국 영양학회에서 제정한 '한국인 영양섭취기준'에 따라 산출된 값을 사용하였다[20]. 고혈압 및 당뇨병 가족력은 과거 해당 질환을 진단받은 적이 있는지를 묻는 문항을 이용하여 '있음', '없음'으로 구분하였으며 폐경은 여성력 조사에서 '최근 3개월간 생리가 있었습니까?'의 문항에 '아니오, 지난 12개월 이상 생리가 없었다'에 해당하여 조사된 폐경 나이를 조사하였다. 폐경 여부를 알 수 있는 조사 항목은 2차 추적 조사부터 추가된 문항으로 기반조사 시점에서의 폐경 연령을 역 추적하여 폐경 여부를 결정하였다.

2) 종속변수

(1) 대사증후군

대사증후군은 NCEP ATP III [21] 기준 중 3가지 이상에 해당하는 경우로 하였다. ① 허리둘레(남자>90 cm, 여자>80 cm), ② 중성지방 150 mg/dL 이상이거나 이상지질혈증약을 복용 중인 경우, ③ 고밀도지단백 콜레스테롤(남자<40 mg/dL, 여자<50 mg/dL), ④ 공복혈당 100 mg/dL 이상이거나 당뇨병약을 복용 중이거나 인슐린 주사를 맞는 경우, ⑤ 수축기혈압≥130 mmHg 또는 이완기혈압≥85 mmHg 이상이거나 혈압조절제 복용 중인 경우 이들 5가지 위험요인 중 3가지 이상을 만족할 때 대사증후군으로 판정하였다.

대사증후군의 발생률은 기반조사에서 판정 기준에 해당되지 않았으나, 추적 조사에서 새롭게 진단된 사람의 분율로 계산하였다.

4. 자료 분석 방법

대상자의 특성에 따른 신체 표현형 비교 및 대사증후군 발생 유무 분석을 위해 Chi-square test, Fisher exact test, Independent t-test, one-way ANOVA, 사후검정으로 Scheffé test를 실시하였다. 신체 표현형을 기준으로 1,000인년(Person-Year) 당 위험 사례 수로 14년 대사증후군 누적 발생률을 계산하였다. 대상자의 신체 표현형이 시간경과의 변화에 따른 대사증후군 누적 발생률의 집단 간 생존함수의 비교를 위해 로그순위분석법(Log-rank method)을 이용하였고 생명표(Life table) 분석으로 도식화하였다. 대상자의 신체 표현형에 따른 대사증후군 발생의 위험을 비교하기 위해 시간의존 콕스의 비례위험 회귀모형(Time-dependent Cox's proportional hazards regression model)을 이용하여 단일 변수분석을 실시하였다. 비례위험 회귀모형의 가정의 검정을 위한 자료의 모델 적합도 평가는 Log Minus Log survival plot (LML plot)을 통해 신체 표현형의 대사증후군 발생에 대한 그래프가 서로 평행으로 일정한 거리를 유지하고 있는지 확인하였다. 대사적으로 건강한 정상체중군을 참조그룹(reference group)으로 설정하고 위험 비율(Hazard Ratio, HR) 과 95% 신뢰구간(Confidence Interval, CI)을 사용하여 대사증후군 발생률에 대한 상대적 위험(relative risk)을 추정하였다. 남자와 여성을 나누어 각각 3개의 Model로 분석하되 Model 1은 통제 변수 없는 단변량으로, Model 2는 인구사회학적 특성(연령, 직업 유무, 소득수준)을 통제 변수로 투입하였으며, Model 3은 Model 2의 통제 변수와 건강관련 특성을 포함시키되 단변량 분석결과를 기반으로 남자의 경우는 고혈압 가족력을, 여자의 경우에는 주관적 건강상태, 하루 평균 수면시간, 폐경 유무를 통제 변수로 포함시켜 분석하였다. 이를 위해 추적 조사 기간 중 대사증후군이 발생한 대상자는 해당 사건(event)의 발생으로, 추적 조사 기간이 종료되는 시점까지 대사증후군이 발생하지 않은 대상자는 중도절단(censored)된 경우로 간주하였다. 자료분석은 IBM SPSS Statistics 26.0을 이용하였고, 모든 통계적 유의수준은 $p < .05$로 설정하였다.

5. 윤리적 고려

KoGES에서 수집된 개인 정보는 통계법 제33조 및 34조에 근거하여 철저하게 보호되고 있다(http://www.law.go.kr/법령/통계법/(20180210,14843,20170809)/제34조). KoGES는 조사 시작 전에 모든 참여 대상자에게 연구 참여에 대한 설명서를 활용하여 소요시간, 이점과 불편감, 정보화된 동의를 구하고 자료 구축과 관련된 윤리적 문제를 최소화하였다. 본 연구의 윤리적 고려를 위하여 연구자 소속의 생명윤리심의위원회의 승인(No. JBNU 2020-04-019)을 얻은 후 질병관리청 국립보건연구원의 심의를 거쳐 최종 승인(No 4851-302)을 받아 진행되었으며 연구 종료 후 질병관리청에 자료 폐기확인서를 제출함으로써 연구윤리 규정을 준수하였다.

연구결과

1. 대상자의 특성에 따른 대사증후군 발생

대상자의 특성에 따른 14년 추적 조사 동안 대사증후군의 발생 유무는 Table 1과 같다. 먼저 남자 총 2,684명 중 대사증후군 발생군 1,113명(41.5%), 비발생군 1,571명(58.5%)이었으며, 발생군과 비발생군의 특성에 따라 차이를 보인 변수는 연령($\chi^2 = 7.40$, $p = .025$), 직업 유무($\chi^2 = 10.20$, $p = .003$), 소득수준($\chi^2 = 6.93$, $p = .031$), 고혈압 가족력($\chi^2 = 18.04$, $p < .001$)이었다. 대사증후군 발생률은 60~64세(48.5%)가 40~49세(40.3%)에 비해 더 높았으며, 직업이 있는 경우(43.1%), 소득수준이 400만원 이상인 경우(46.4%), 고혈압 가족력이 없는 경우(60.4%) 대사증후군 발생률이 높았다.

여자 총 2,384명 중 대사증후군 발생군 1,032명(43.3%), 비발생군 1,352명(56.7%)이었으며, 발생군과 비발생군의 특성에 따라 차이를 보인 변수는 연령($\chi^2 = 92.66$, $p < .001$), 직업 유무($\chi^2 = 13.24$, $p < .001$), 교육수준($\chi^2 = 13.21$, $p < .001$), 소득수준($\chi^2 = 54.56$, $p < .001$), 주관적 건강상태($\chi^2 = 6.15$, $p = .046$), 하루 평균 수면시간($\chi^2 = 14.05$, $p = .001$), 폐경 유무($\chi^2 = 68.76$, $p < .001$)이었다. 대사증후군 발생률은 60~64세(60.7%)가 40~49세(36.0%)에 비해 더 높았으며, 직업이 있는 경우(48.2%), 교육수준이 고졸이하인 경우(44.4%), 소득수준이 200만원 미만인 경우(49.1%), 주관적 건강상태는 평소 자신의 건강상태를 보통이라고 평가하는 경우(45.4%), 하루 평균 수면시간이 9시간 이상인 경우(51.9%), 폐경을 한 경우(63.5%) 대사증후군 발생률이 높았다.

2. 신체 표현형에 따른 대사증후군의 누적 발생률

대상자의 신체 표현형에 따른 대사증후군 누적 발생률은 Table 2와 같다. 대사증후군 발생 건수와 관찰 기간의 합은 남자의 경우 총 21,724.50인년이고, 대사증후군 발생률은 1,000인년 당 MHNW군 29.3건, MHOW군 54.3건, MHO군 81.9건으로 신체 표현형에 따른 대사증후군 발생률에 유의한 차이가 있었다($F = 92.83$, $p < .001$). 전체 관찰기간의 중앙값은 94.9개월, 평균값은 97개월이었다. MHNW군의 대상자는 998명, 대사증후군 발생자는 268명(26.9%), 총 관찰인년은 9,138.70, MHOW군의 대상자는 848명, 대사증후군 발생자는 366명(43.2%), 총 관찰인년은 6,740.40, MHO군의 대상자는 838명, 대사증후군 발생자는 479명(57.2%), 총 관찰인년은 5,845.40이었다. 사후분석 결과, MHO군이 MHOW군과 MHNW군에 비해 대사증후군 발생률이 높았다($F = 92.83$, $p < .001$).

여자의 경우 총 18,912.50인년이고, 대사증후군 발생률은 1,000인년 당 MHNW군 31.5건, MHOW군 57.7건, MHO군 85.8건으로 신체 표현형에 따른 대사증후군 발생률에 유의한 차이가 있었다($F = 81.48$, $p < .001$). 전체 관찰기간의 중앙값은 95.4개월, 평균값은 95.1개월이었다. MHNW군의 대상자는 899명, 대사증후군 발생자는 253명(28.1%), 총 관찰인년은 8,031.90, MHOW군의 대상자는 679명, 대사증후군 발생자는 316명(46.5%), 총 관찰인년은 5,481.80, MHO군의 대상자는 806명, 대사증후군 발생자는 463명(57.4%), 총 관찰인년은 5,398.80이었다. 사후분석 결과, MHO군이 MHOW군과 MHNW군에 비해 대사증후군 발생률이 높았다($F = 81.48$, $p < .001$).

MHNW군, MHOW군, MHO군의 로그 순위 검정(Log-rank test)을 수행한 결과, 신체 표현형 별 대사증후군 누적 발생률에 차이가 있었으며($p < .001$), MHO군에서 대사증후군 발생의 증가는 기간에 따라 점진적으로 증가하는 곡선을 보였다(Figure 2).

3. 신체 표현형에 따른 대사증후군 발생 비례위험

1) 모델 적합도 평가

본 연구의 모델 적합도 평가는 Log Minus Log survival plot (LML Plot)으로 확인하였다. LML Plot에서 신체 표현형의 대사증후군에 대한 그래프가 서로 평행하므로 해당 모형은 비례위험 가정을 만족하였다(Figure 3).

Table 1. Metabolic Syndrome Incidence according to Characteristics of Participants (*N*=5,068)

Characteristics	Categories	Male (n=2,684)					Female (n=2,384)				
		Metabolic syndrome				χ^2 (*p*)	Metabolic syndrome				χ^2 (*p*)
		Yes (n=1,113)		No (n=1,571)			Yes (n=1,032)		No (n=1,352)		
		n (%)		n (%)			n (%)		n (%)		
Age (years)	40~49	667	(40.3)	990	(59.7)	7.40 (.025)	546	(36.0)	969	(64.0)	92.66 (<.001)
	50~59	296	(41.2)	422	(58.8)		322	(53.8)	277	(46.2)	
	60~64	150	(48.5)	159	(51.5)		164	(60.7)	106	(39.3)	
Spouse	Yes	1,063	(41.3)	1,509	(58.7)	0.53 (.468)	919	(42.7)	1,231	(57.3)	2.36 (.124)
	No	48	(44.9)	59	(55.1)		110	(48.0)	119	(52.0)	
Occupation	Employed	898	(43.1)	1,185	(56.9)	10.20[†] (.003)	409	(48.2)	440	(51.8)	13.24 (.001)
	Unemployed	1	(33.3)	2	(66.7)		545	(40.9)	789	(59.1)	
	Others	212	(35.9)	379	(64.1)		74	(38.5)	118	(61.5)	
Education	≤ High school	867	(42.5)	1,173	(57.5)	3.52 (.061)	966	(44.4)	1,208	(55.6)	13.21 (<.001)
	≥ College	244	(38.3)	393	(61.7)		63	(31.2)	139	(68.8)	
Monthly income (10,000 won)	< 200	598	(42.5)	808	(57.5)	6.93 (.031)	694	(49.1)	719	(50.9)	54.56 (<.001)
	200~< 400	378	(38.5)	603	(61.5)		257	(34.3)	493	(65.7)	
	≥ 400	129	(46.4)	149	(53.6)		56	(31.5)	122	(68.5)	
Self-reported health status	Healthy	441	(41.6)	618	(58.4)	3.76 (.153)	279	(39.5)	427	(60.5)	6.15 (.046)
	Average	450	(43.0)	597	(57.0)		413	(45.4)	497	(54.6)	
	Unhealthy	218	(38.0)	355	(62.0)		338	(44.5)	422	(55.5)	
Fatigue	Yes	619	(41.8)	862	(58.2)	0.33 (.567)	628	(42.9)	837	(57.1)	0.08 (.782)
	No	479	(40.7)	698	(59.3)		388	(43.4)	505	(56.6)	
Cigarette smoking	Never smoker	204	(38.3)	328	(61.7)	5.01 (.082)	983	(43.6)	1,270	(56.4)	2.74 (.254)
	Former smoker	318	(40.3)	472	(59.7)		12	(46.2)	14	(53.8)	
	Current smoker	590	(43.5)	765	(56.5)		26	(34.2)	50	(65.8)	
Alcohol consumption	Never drinker	207	(41.8)	288	(58.2)	0.38 (.826)	670	(43.0)	887	(57.0)	1.31 (.519)
	Former drinker	95	(39.6)	145	(60.4)		27	(50.9)	26	(49.1)	
	Current drinker	808	(41.6)	1,136	(58.4)		329	(43.2)	433	(56.8)	
Physical activity	Yes	137	(42.3)	187	(57.7)	0.02 (.891)	153	(42.5)	207	(57.5)	0.44 (.506)
	No	207	(42.8)	277	(57.2)		149	(45.0)	182	(55.0)	
Sleep duration (per night)	≤ 6 h	426	(40.0)	639	(60.0)	1.44 (.487)	460	(39.6)	703	(60.4)	14.05 (.001)
	7~8 h	602	(42.4)	818	(57.6)		498	(46.1)	582	(53.9)	
	≥ 9 h	77	(41.4)	109	(58.6)		67	(51.9)	62	(48.1)	
Family history of HTN	Yes	237	(50.2)	235	(49.8)	18.04 (<.001)	218	(45.5)	261	(54.5)	1.21 (.272)
	No	1,336	(60.4)	876	(39.6)		814	(42.7)	1,091	(57.3)	
Family history of DM	Yes	139	(45.3)	168	(54.7)	2.07 (.150)	141	(43.8)	181	(56.2)	0.04 (.846)
	No	974	(41.0)	1,403	(59.0)		891	(43.2)	1,171	(56.8)	
Menopause	Yes	-		-			428	(63.5)	246	(36.5)	68.76 (<.001)
	No	-		-			451	(43.0)	597	(57.0)	

DM=diabetes mellitus; HTN=hypertension.

[†] Fisher exact test.

2) 신체 표현형에 따른 대사증후군의 발생 비례위험: 회귀분석 결과

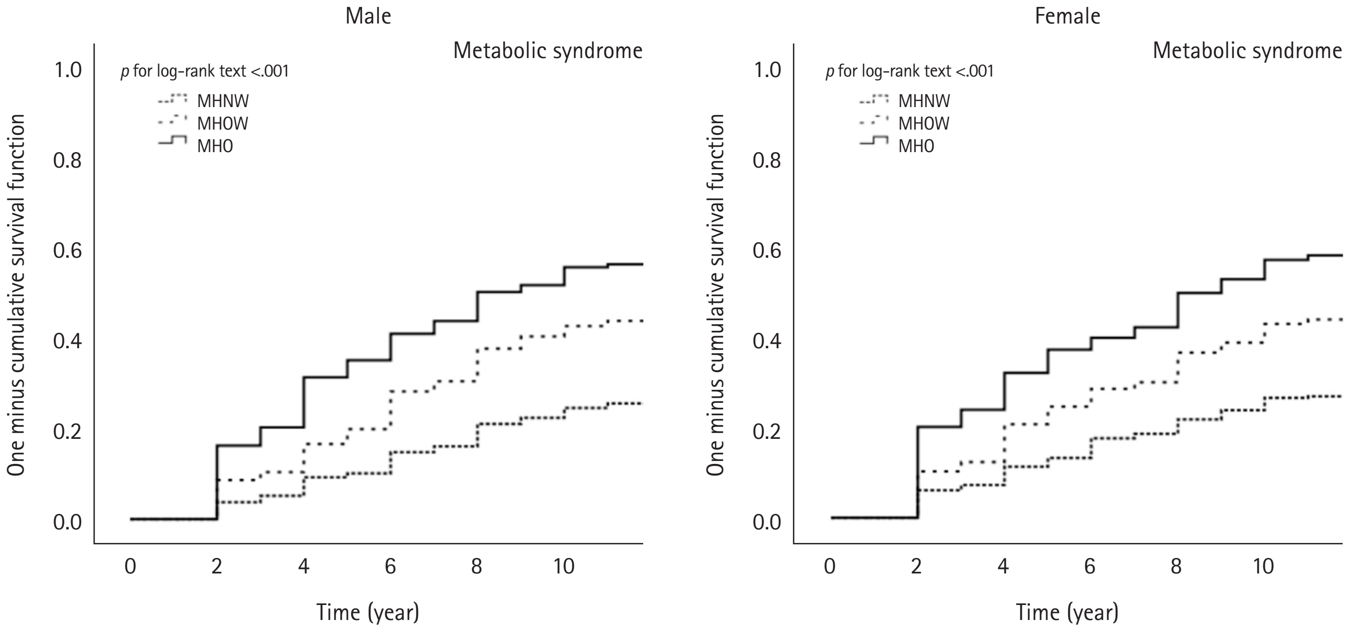
대상자의 신체 표현형에 따른 대사증후군의 발생 비례위험을 확인하기 위해 시간의존 콕스의 비례위험 회귀모형(Time dependent Cox's proportional hazards regression model) 분석 결과는 Table 3과 같다. 본 연구에서는 신체 표현형을 시간의존 독립변수로 선정하였기 때문에 시간의존 독립변수로 새로이 만들 필요가 있다. 즉, 신체 표현형은 T_COV로 시간의존 독립변수로 전환하였으며 2년 간격으로 7차 추적 조사된 자료를 각각 하나의 시간의존자료로 묶어 사용하였다. 가령 2차년도의 신체 표현형은 해당 종속변수에 그리고 4차년도의 신체 표현형은 4차년도의 종속변수에 영향을 미치도록 하였다.

분석결과 남자의 경우에는 신체 표현형에 따른 대사증후군 발생

Table 2. The Cumulative Incidence of Metabolic Syndrome according to the Body Size Phenotype of Participants (*N*=5,068)

Gender	Body size phenotype	Person-year	n[†] (%)	Incidence[‡]	F (*p*)	Sheffé test
Male (n = 2,684)	MHNW[a]	9,138.70	268 (26.9)	29.3	92.83 (< .001)	c > b > a
	MHOW[b]	6,740.40	366 (43.2)	54.3		
	MHO[c]	5,845.40	479 (57.2)	81.9		
Female (n = 2,384)	MHNW[a]	8,031.90	253 (28.1)	31.5	81.48 (< .001)	c > b > a
	MHOW[b]	5,481.80	316 (46.5)	57.7		
	MHO[c]	5,398.80	463 (57.4)	85.8		

MHNW = metabolically healthy normal weight; MHO = metabolically healthy obesity; MHOW = metabolically healthy over weight.
[†] n = case of incidence; [‡] case per 1,000 person-year.

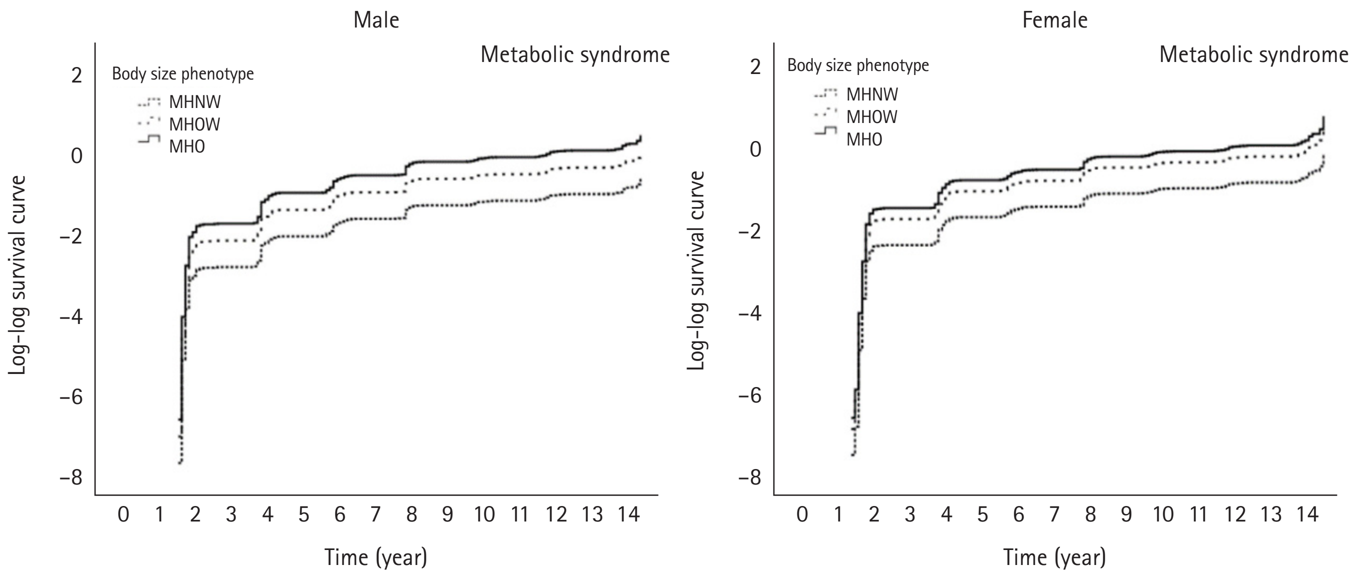


	Number of incidence														
MHNW	0	33	12	34	7	37	10	38	10	16	7	24	6	28	6
MHOW	0	66	13	45	23	57	15	47	17	14	7	29	5	18	10
MHO	0	124	30	81	27	41	19	43	10	25	4	27	11	21	16
Time (year)	baseline	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Number of incidence														
MHNW	0	48	9	30	14	31	7	22	14	18	2	20	5	16	17
MHOW	0	62	12	48	22	22	8	36	12	22	5	15	13	27	12
MHO	0	143	26	55	34	17	15	48	19	26	6	30	7	17	20
Time (year)	baseline	1	2	3	4	5	6	7	8	9	10	11	12	13	14

Figure 2. The cumulative incidence rate of metabolic syndrome in participants.

의 위험은 MHNW군에 비해 Model 1에서 MHOW군 1.90배(95% CI = 1.53~2.36), MHO군 2.80배(95% CI = 2.26~3.46), Model 2에서 MHOW군 1.91배(95% CI = 1.53~2.38), MHO군 2.92배(95% CI = 2.35~3.62), Model 3에서 MHOW군 1.92배(95% CI = 1.54~2.40), MHO군 2.88배(95% CI = 2.32~3.58)로 시간에 따라 대사증후군 발생 위험이 증가하였으며 모두 통계적으로 유의하였다.

여자의 경우에는 신체 표현형에 따른 대사증후군 발생의 위험은 MHNW군에 비해 Model 1에서 MHOW군 1.88배(95% CI = 1.52~2.34), MHO군 2.46배(95% CI = 1.99~3.03), Model 2에서 MHOW군 1.90배(95% CI = 1.52~2.37), MHO군 2.31배(95%



MHNW=metabolically healthy normal weight; MHO=metabolically healthy obesity;
MHOW=metabolically healthy over weight.

Figure 3. Goodness of fit test of Cox's proportional hazard model.

Table 3. Time Dependent Proportional Risk of Metabolic Syndrome according to the Body Size Phenotype of Participants (N=2,216)

Gender	Division	Body size phenotype				
		MHNW (n=380)	MHOW (n=391)		MHO (n=378)	
			HR (*p*)	95% CI	HR (*p*)	95% CI
Male (n=1,149)	Model 1	1.00 (Reference)	1.90 (<.001)	1.53~2.36	2.80 (<.001)	2.26~3.46
	Model 2	1.00 (Reference)	1.91 (<.001)	1.53~2.38	2.92 (<.001)	2.35~3.62
	Model 3	1.00 (Reference)	1.92 (<.001)	1.54~2.40	2.88 (<.001)	2.32~3.58
Female (n=1,067)	Model 1	1.00 (Reference)	1.88 (<.001)	1.52~2.34	2.46 (<.001)	1.99~3.03
	Model 2	1.00 (Reference)	1.90 (<.001)	1.52~2.37	2.31 (<.001)	1.87~2.86
	Model 3	1.00 (Reference)	1.89 (<.001)	1.51~2.37	2.34 (<.001)	1.88~2.90

Model 1 not adjusted.
Model 2 adjusted for age, occupation, monthly income.
Model 3 adjusted for model 2 plus family history of hypertension.
CI=confidence interval; HR=hazard ratio; MHNW=metabolically healthy normal weight; MHO=metabolically healthy obesity; MHOW=metabolically healthy over weight.

CI=1.87~2.86), Model 3에서 MHOW군 1.89배(95% CI=1.52~2.37), MHO군 2.34배(95% CI=1.88~2.90)로 시간에 따라 대사증후군 발생 위험이 증가하였으며 모두 통계적으로 유의하였다.

논의

본 연구는 한국인유전체역학조사사업에서 수집한 지역사회기반 코호트의 종단자료를 이용하여 40~64세의 대사적으로 건강한 성인에서 신체 표현형에 따른 대사증후군 발생 위험에 미치는 영향을 평가하고, 시간이 지남에 따라 대사 건강을 유지하는지를 확인하고, 대사증후군 구성요인에서 발생할 수 있는 변화를 조사하여 체중조절과 대사증후군 예방 및 건강증진 교육의 기초자료로 제공하기 위해 시행되었다. 대사증후군 발생에 영향을 미치는 요인으로는 남자는 연령, 직업 유무, 소득수준, 고혈압 가족력이었으며, 여자는 연령, 직업 유무, 교육수준, 소득수준, 주관적 건강상태, 평균 수면시간, 폐경 유무로 나타났다.

본 연구에서 대사증후군이 없는 남자와 여자를 14년 추적 관찰한 결과, 대사증후군의 발생률은 남자 41.5%, 여자 43.3%로 높게 나타났으며 모두 연령이 증가할수록 더 높았다. Lym 등[22]의 연구에서도 남자는 30대에서 대사증후군 유병률이 급격하게 증가하였고, 70대 이상에서 가장 높았으며, 여자는 50대에서 유병률이 급격하게 증가하였고, 60대에서 가장 높은 유병률을 보였다. 이러한 결과

는 연령이 높아짐에 따라 대사증후군 구성요인에 해당하는 질환들을 보유할 가능성이 큼을 암시하며 특히 여자는 폐경기 전에는 일정한 신체조성을 유지하는 반면 폐경기 후에는 호르몬의 변화, 대사 활동성 조직의 감소, 약 2.5%의 지방이 증가됨과 관련이 있는 것으로 보고되고 있다[23].

남자와 여자 모두에서 직업이 있는 경우 직업이 없는 경우보다 대사증후군의 유병률이 더 높게 나타났으며 이러한 결과는 선행연구와 유사하였다[24]. 이와 반대로 직업이 있는 경우 규칙적인 생활을 하므로 대사증후군에 이환될 가능성이 낮았다는 보고도 있다[25]. 노르웨이에서 유급 노동(paid work) 성인을 대상으로 평균 12.4년 추적 기간 동안 직장에서 좌식 작업을 하는 사람은 2.74배, 육체 노동이 많은 사람은 3.02배로 모든 원인으로 인한 사망과 연관성이 있었으며 주로 심혈관계질환으로 사망한 것으로 보고되었다[26]. 이상의 상이한 결과를 확인하기 위하여 추후 연구에서는 직업에 따른 대사증후군의 비교 시 단순한 직업 유무보다는 신체활동 정도를 반영한 직업으로 대사증후군의 차이를 비교할 필요가 있으며, 전업주부를 포함한 직업군에 따른 대사증후군 유병률 비교를 위한 연구가 필요하리라 생각된다.

여자에서 교육수준이 고졸 이하인 경우 대사증후군의 유병률이 높았으며, Lee [27]와 Kim과 Baek [28]의 연구에서도 교육수준이 낮을수록 대사증후군에 영향을 주었으며, 남자보다 여자에서 강한 상관관계가 있는 것으로 나타났다. 학력은 건강결정요인에서도 중요한 요인[29]이므로 일반적으로 여자는 남자보다 건강에 대한 관심도가 높으므로[30] 학력수준이 낮은 여성을 위한 건강지식의 획득과 건강생활실천 향상을 위한 정보와 자원을 쉽게 접근할 수 있는 환경을 제공하는 등 적극적인 대사증후군을 예방하는 방안이 필요하겠다. 남자는 월 평균 수입이 많을수록, 여자는 적을수록 대사증후군의 유병률이 높았으며, Lee [27]의 연구에서 고소득자에서 유의하게 대사증후군 위험이 증가하는 경향을 보였고 이와 반대로 소득수준이 대사증후군이 있는 집단은 정상군보다 하위의 비율이 높고 상위의 비율이 낮았으며, 최저소득 집단에서 대사증후군 발생의 오즈비가 증가하였다[31]. 소득수준에 따라서 대사증후군 위험에 노출되는 정도가 다르다는 것을 알 수 있으며 특히 저소득층의 여자의 경우 경제적인 이유로 질병 예방을 위한 건강행태에 대한 관심이 적을 수 있으므로 적극적인 교육이 필요할 것으로 생각된다. 또한 소득수준이 높을 경우 권장 영양섭취 기준을 초과하는 섭취비율이 높고 지방 및 전체 에너지를 더 많이 섭취하는 서구화된 식습관으로 변하는 경향이 있어[32] 이로 인하여 고지혈증, 비만 등이 유발되기 쉬워 대사증후군 발생으로 이어지기 쉽다고 본다.

본 연구결과 여자에서 평소에 본인의 건강상태에 대해 보통과 건강하지 않다라고 느끼는 경우와 평소 수면시간이 많을수록 대사증후군의 유병률이 높은 것으로 나타났다. Lee [27]의 연구에서도 건강하지 않다라고 느끼는 경우 대사증후군 위험이 높았으며, Jung [33]의 연구에서도 9시간 이상인 과다 수면일수록 적정 수면보다 대사증후군과의 관련성이 높았는데 이는 대사증후군 위험요인 중 혈압은 수면시간에 따라 유의한 차이가 있어 과다 수면인 경우 혈압에 영향을 미쳐 대사증후군 유병률 증가로 이어질 수 있음을 보여준다. 본 연구에서도 체질량지수가 증가할수록 자신의 건강을 나쁘게 인식하였고, 정상 수면보다 과다 수면에서 주관적 건강상태가 낮다는 선행연구 결과들과 일치되는 결과를 보였다. 주관적 건강상태는 건강관련 삶의 질의 하나의 지표가 될 수 있으므로 건강관리 측면에서 반드시 다루어져야 할 요소라고 생각된다.

남자에서 고혈압 가족력이 없는 경우 대사증후군의 유병률이 높은 것으로 나타났다. 선행연구에서 고혈압 가족력 유무는 대사증후군의 유병률 차이가 없다는 연구[34], 고혈압 가족력이 있는 남자에서 대사증후군 발생 오즈비가 1.41배 높다는 연구[35], 양쪽 부모 모두 고혈압 가족력이 있는 경우 비교위험도가 8.3배까지 증가하여 대사증후군의 발생에 유전과 가족력이 중요한 역할을 한다는 연구[36] 등 연구마다 결과에 차이가 있었다. 이러한 이유는 교란변수와 생활습관 관련 요인에 대한 보정이 차이가 났기 때문으로 여겨진다. 가족력은 유전적 요인과 함께 한 가족이 공유하는 환경과 생활습관을 반영하기 때문에 발생 위험에 영향을 미칠 수 있지만 전적으로 유전적 요인의 영향을 반영한다고 볼 수 없으나 특히 고혈압 가족력이 있는 남자는 대사증후군 예방에 더 주력해야 한다는 점을 시사하고 있다고 볼 수 있겠다.

대상자의 신체 표현형에 따른 대사증후군의 발생 위험은 남자는 MHNW군에 비해 MHOW군과 MHO군이 대사증후군 발생이 남자는 공변량 보정 후 MHOW군 1.96배, MHO군 3.11배 대사증후군의 발생 위험이 높은 것으로 나타났으며, 여자는 공변량 보정 후 MHOW군 1.89배, MHO군 2.70배 대사증후군의 발생 위험이 높은 것으로 나타났다. 남자와 여자 모두에서 모든 대사증후군 구성요인의 대사 이상이 MHOW군과 MHO군에서 위험이 증가하였다. 즉, 남자와 여자 모두에서 MHNW군에 비해 MHOW군과 MHO군은 대사증후군과 구성요인의 발생 위험을 높이는 것이는 것으로 나타났다. 따라서 MHOW와 MHO 개인을 식별하면 조기 위험 계층화와 보다 효과적인 중재 개입이 가능할 수 있을 것으로 생각된다.

Chang 등[15]의 연구에서도 대사증후군 발생의 위험비는 공변량 보정 후 MHNW군에 비해 MHOW군 1.69배, MHO군 1.84배 높았으며 시간의존 모델에서 MHOW군 2.76배, MHO군 3.40배 더 많이 발생하는 것으로 나타났으며 모든 대사증후군 구성요인의 대사 이상이 MHOW군과 MHO군에서 위험이 증가하여 현재는 대사적으로 건강하지만 BMI가 높을수록 시간이 경과함에 따라 비만과 관련된 대사 장애 질환을 겪는다는 것을 알 수 있고 MHOW군과 MHO군은 MHNW군만큼 건강하지 않다는 것을 시사하고 있다. 또한 기반조사로부터 1.8년 추적 기간 동안 안정된 체중변화(-1.0~1.0kg)를 보인 대상자만을 분석하였을 때 대사 이상 중 하나가 발생할 위험이 증가하였다. 본 연구에서도 기반조사에서 대사 이상이 없었던 대상자가 2년 후 추적하였을 때 대사증후군과 구성

요인의 발생자가 남녀 모두에서 MHO군에서 급격히 증가하였고 MHOW군에서도 심각한 수준이었으며 시간의존 모델에서도 발생 위험은 여전히 높았다. 따라서 과체중 및 비만 환자를 주의 깊게 모니터링하고, 건강한 체중과 생활 방식에 대해 상담하는 것 외에도 대사 프로파일을 주의 깊게 관찰해야 하겠다.

MHNW군에 비해 심뇌혈관 사망률의 위험이 10년 이상 추적 기간 동안 MHOW군의 상대적 위험비 1.21배, MHO군의 상대적 위험비 1.24배[37], 7년 추적 기간 동안 MHO군은 MHNW군에 비해 심뇌혈관 사망률의 위험이 남자 1.45배, 여자 1.04배 위험이 증가하였다[38].

노르웨이에서 세계당뇨연맹(International Diabetes Federation, IDF) 진단기준에 따른 성인의 대사증후군 유병률 관련 요인으로 정상체중군에 비해 비만군에서 오즈비가 14.08배로 가장 높게 나타났다[39]. 미국에서 수행된 단면연구에서 성인의 대사증후군 유병률은 BMI가 25~30 kg/m^{2}인 경우 44.3%, 30 kg/m^2 이상인 경우 65.1%로 BMI가 큰 경우 대사증후군의 유병률도 더욱 높게 나타난 것으로 보고되었고[40], 본 연구에서도 남자는 MHOW군 54.3%, MHO군 81.9%, 여자는 MHOW군 57.7%, MHO군 85.8%로 높게 나타나 BMI가 클수록 대사증후군 유병률도 높아 선행연구와 유사한 결과이다.

Ervin [41]의 연구에서도 BMI가 대사증후군에 중요한 위험요인으로 보고되었는데, 정상체중과 저체중에 비해 과체중에서 대사증후군 위험 6.17배, 비만에서 31.92배로 보고되었고 비만은 혈압과 혈당 상승, 고지혈증, 고밀도지단백 콜레스테롤 수치를 낮추며 인슐린 저항성의 유발에 관여하여 심혈관질환 위험을 높이는 요인[42]이기 때문에 적극적인 관리가 필요하다. 연구마다 유병률이나 오즈비 및 위험비에 있어서 차이는 있지만, 비만은 대사증후군 유병률과 관련 요인 가운데 하나라고 할 수 있다.

결론

본 연구 결과 대사적으로 건강할지라도 과체중이나 비만의 경우에는 대사증후군 발생률이 높다는 것을 발견하였다. 따라서, 과체중과 비만 환자를 주의 깊게 모니터링하여 건강한 체중과 생활양식에 대해 상담하고 대사증후군 구성요인을 신중하게 감시하고 과체중과 비만 환자는 대사증후군 예방관리를 위해서는 스스로의 대사증후군 구성요인 수치를 바로 알고 관리하는 것이 중요하겠다. 본 연구의 강점은 14년의 긴 추적 기간과 시간변화에 따른 신체 표현형의 변화를 반영한 통계기법의 사용, 그리고 인구사회학적 요인 및 건강생활습관 요인 등을 통제하였다는 점이다. 유전과 같은 대사증후군 발생에 영향을 미치는 다양한 요인을 통제하기 위해 향후 추가적인 대규모 코호트 구축과 환경요인을 파악하기 위한 광범위한 자료구축 등이 지속적으로 수행되어야 하겠다. 또한, 대사증후군 구성요인 중 1~2개의 위험인자를 보유한 인구집단을 대상으로 시간변화에 따른 건강결과도 확인하는 연구를 제안한다.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Authors' contributions

Kim, Ji Young contributed to data curation, formal analysis, methodology, visualization, writing - original draft, review & editing, and investigation. Yang, Youngran contributed to conceptualization, methodology, project administration, visualization, writing - review & editing, investigation, software, supervision, and validation.

Data availability

Available upon reasonable reasons.

Acknowledgments

This article is based on a part of the first author's doctoral dissertation from Jeonbuk National University.

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RCPHN
Research in Community and Public Health Nursing

Review Article
pISSN 2983-0648 · eISSN 2288-4203
Res Community Public Health Nurs 2023;34(2):171-182
https://doi.org/10.12799/rcphn.2023.00094

Factors Related to Diabetes Self-Care among Immigrants in the United States: A Scoping Review

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Purpose: The purpose of this scoping review was to explore related factors in diabetes self-care among immigrants in the U.S. Diabetes is one of the fastest-growing chronic illnesses, but little is known about factors in self-care among minority immigrants in the U.S.
Methods: The Arksey and O'Malley (2005) methodological framework guided this review, which examined 16 articles, including qualitative, quantitative, and mixed-methods designs. PRISMA guidelines were used with five Databases. Search terms included: immigrants in the U.S., type 2 diabetes, self-care, and self-management.
Results: Factors related to diabetes self-care among immigrants were identified: (1) changed dietary lifestyle, (2) low economic and health insurance, (3) social support and resources, (4) low English proficiency, (5) psychological contexts, and (6) gender roles.
Conclusion: Given the culturally unique related factors in diabetes self-care among immigrants, healthcare professionals must be knowledgeable and responsive to the ethnic minority immigrants' needs to promote effective diabetes self-care.

Keywords: immigrants and emigrants; diabetes mellitus; self-care; United States

Introduction

Diabetes is one of the chronic diseases with the quickest rate of increase in the 21st century. The number of people with diabetes has tripled in the past two decades [1]. Type 2 diabetes (T2D) is the most prevalent form of diabetes, accounting for about 90% of cases. As of 2021, approximately 537 million adults (20-79 years) worldwide were living with diabetes [1]. By 2045, this number will reach 700 million. Immigrants from racial and ethnic minorities are disproportionately affected by diabetes in the U.S. (US) [2]. American Indians and Alaska Natives, black or African Americans, Latinos or Hispanics, Asian Americans, Native Hawaiians, and other Pacific Islanders are among these racial and ethnic minority immigrants. Immigrants from ethnic minorities have a higher prevalence [3] and burden [4] of managing diabetes than whites, as well as more complications [3]. According to a number of studies, obstacles for ethnic immigrants in the U.S. include language barriers, a lack of health professional awareness of cultural health preferences, and a lack of culturally adapted interventions [5]. Despite advances in medical technology and expanding access to health care, ethnic minority immigrants continue to face disadvantages in maintaining optimal health due to these obstacles.

Diabetes necessitates ongoing self-care or self-management in order to prevent further complications and deterioration [6]. Ineffective self-care for T2D can result in acute and long-term complications (such as skin and eye complications, neuropathy, and functional disability) and even death [6]. Self-care for diabetes is however complex and challenging, involving multiple tasks such as medication regimen, diet control, blood sugar monitoring, and routine medical visits [7]. Self-care for diabetes requires patients to make substantial lifestyle adjustments. Cultural differences among ethnic minority immigrants may influence their diabetes self-care, health care decision-making, and relationships with health care providers [8]. Identifying and understanding the context that facilitates and affects diabetes self-care would

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Received: February 28, 2023; **Revised:** June 8, 2023; **Accepted:** June 13, 2023

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strengthen future interventions and education that are culturally tailored. However, few studies have examined and investigated the associated factors, facilitators, challenges, and barriers in diabetes self-care among ethnic immigrants in the US. This scoping review aimed to examine factors related to T2D self-care among immigrants in the US.

Methods

This scoping review utilized five stages based on Arksey and O'Malley's [9] guidelines to examine T2D self-care related factors among ethnic minority immigrants in the US. This review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [10,11]. The stages are listed below.

Stage 1: Identifying the Research Questions and Eligibility Criteria

The research objective was to explore factors related to diabetes self-care among immigrants in the US. The research questions were as follows:

1. What sample and settings were included in each study?
2. What were the diabetes self-care related factors among immigrants in the U.S.?
3. How different were the diabetes self-care related-factors, challenges and barriers among different ethnic immigrants?

The article selection criteria were as follows: (1) aimed at adult immigrants with diabetes; (2) centered on self-care or self-management of T2D; (3) conducted in the U.S.; (4) published between 2010 and 2021; (5) peer-reviewed studies; and (6) published as an academic journal in English.

Exclusion criteria were as follows: (1) included childhood group in the participants, (2) included other chronic illnesses, and (3) conducted in other countries, not in the U.S..

Stage 2: Identifying Relevant Publications

Five databases were consulted for this review: CINAHL, Health Source Nursing Academic Edition, Medline Plus, PsycInfo, and Sociology Index (SOCIndex). We searched these databases for articles published between 2010 and 2021.

Stage 3: Selecting Publications

The search included three constructs (i.e., immigrants in the U.S., self-care, and diabetes). The following search combinations were used: ("immigrants in the U.S.") AND ("self-care" OR "self-management") AND ("diabetes type 2" OR "diabetes mellitus type 2" OR "diabetes 2"). The search included qualitative, quantitative studies, and published reviews in English reporting on self-care among immigrants with diabetes in the U.S.

Stage 4: Charting the Data (PRISMA Figure 1)

121 articles were retrieved by applying the inclusion and exclusion criteria and utilizing the major key terms. From the 121 articles, 94 were eliminated due to their title, abstract, or duplication. A thorough full-text review of the remaining 27 articles was conducted, and 16 articles meeting the eligibility criteria were selected (Figure 1).

Stage 5: Collating, Summarizing, and Reporting the Results

The articles included in this scoping review are listed in Table 1. Ethnic immigrants from China, South Korea, Mexico, Sub-Saharan Africa, Haiti, Somalia, Middle Eastern countries (Iran, Turkey, and Lebanon), and Latin American countries participated in the selected studies. Ten articles employed qualitative methods, four employed quantitative methods, and two employed mixed methods.

Results

Study Characteristics

Among the 16 articles, four articles focused on Chinese immigrants [12-15]. The other four articles were about Korean immigrants [16-19], and three focused on Hispanic immigrants [20-22]. The other four articles included Sub-Saharan African [23], Haitian immigrants [24], Middle-Eastern immigrants [25], and Somali immigrants [26]. Last one article focused on East Asian immigrants from four Asian countries, including China, Japan, South Korea, and Taiwan [27]. The participants' age range in the 16 selected articles was from 27 to 86. The mean number of participants in 10 qualitative studies and four qualitative studies was approximately 28 and 206, respectively. All participants in the 16 articles reported that they had been diagnosed with T2D for at least one year and were self-identified immigrants.

After data analysis, six major themes were identified as factors related to T2D self-care among immigrants in the U.S.: changed dietary lifestyle, low economic status and health insurance, social support and resources, low English proficiency, psychological contexts, and gender roles.

Changed Dietary Lifestyle

For managing diabetes, dietary modification presented a significant obstacle for ethnic immigrants. According to six studies

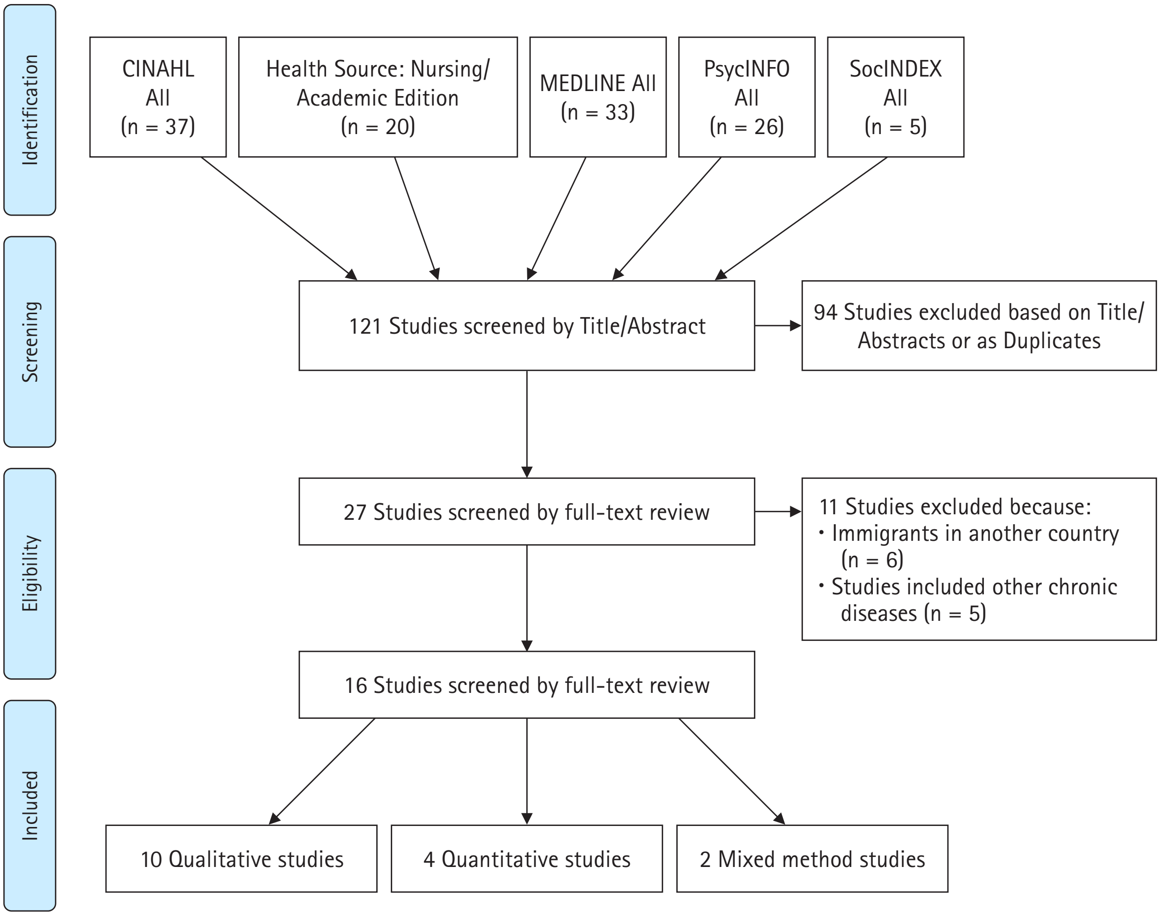

Figure 1. PRISMA flow diagram.

[12-17,20,23,25], when immigrants attempted to change their eating habits and dietary lifestyle, they encountered obstacles. The participants in Cha's [16] study reported having difficulty adhering to diabetic dietary recommendations. Maintaining traditional Korean views of food, a lack of culturally sensitive diabetic diet guidelines, and locating American foods that satisfied their taste preferences in the United States were the obstacles. Traditional Korean "good" foods include meat, poultry, and white steamed rice. Vegetables and multigrain rice (e.g., barley rice) are considered "bad" or "poor" foods among Koreans, particularly among older Koreans. Koreans believe that sick individuals should consume "good" food to restore their health, regardless of the quantity of "good" food consumed. These beliefs inhibit the diabetic immigrants from Korea from adopting a diabetic diet and lifestyle. The recommended diabetic diet affects the spouses of diabetic Korean immigrants. In the study by Choi [17], spouses of Korean immigrants with diabetes most frequently mentioned a diabetic diet. For instance, the husband of a female Korean immigrant with diabetes stated that he was a terrible husband because he ate his preferred white rice at every meal with his wife. Even though he was aware that his wife liked white rice and had trouble adhering to a diabetic diet, he ate his preferred Korean foods. The husband felt guilty because he did not consume the same foods as his wife.

According to Chesla [12], the Chinese immigrants' diet posed the greatest difficulty in managing their diabetes. Rice has many cultural and historical connotations for the Chinese, including the maintenance of holistic health and well-being [12]. Therefore, replacing white rice with "tasteless" brown, red, or black rice is a difficult task. According to Chesla [12], the restriction of rice could cause emotional distress and depression. Diabetic diets complicate social interactions such as family outings, meals, and celebrations.

In regards to dietary restrictions, family members feel obligated to the patients, but they also recognize the value of social comfort and enjoyment. Therefore, some immigrants are hesi-

Table 1. Summary of Included Articles

Author, Year	Purpose	Design	Participants	Geographic location	Findings
Cha, 2012	To explore potential factors affecting the self-care behaviors of Korean immigrants with T2DM	Qualitative	Korean immigrants (n = 20) Female = 11, male = 9 Age: 52-76	Atlanta, Georgia, U.S.	Identified three major ideas: (1) issues on treatment regimen related to medications & diet (2) resources that helped or hindered their ability to manage diabetes (3) physician-patient relationship
Chesla, 2009	To describe cultural & family challenges to illness management in Chinese immigrants with T2DM & their spouses	Qualitative	20 foreign-born Chinese American couples (n = 40) Age: 35-75	San Francisco	Diabetes symptoms challenged family harmony. Dietary prescriptions challenged food beliefs & practices. Disease management requirements challenged established family role responsibilities.
Chesla, 2014	To explore gender differences in factors associated with diabetes management with behavioral intervention in Chinese immigrants	Quantitative	Chinese immigrants with T2DM (n = 178) Age: 51-70	San Francisco, Chinatown	Chinese women immigrants reported significantly poorer self-assessed general health & depression ($p < .5$), and tended to have greater total diabetes distress, emotional burden, and interpersonal distress ($p < .1$). However, statistically significant gender differences were not found for diabetes self-efficacy, family conflict, and family emotional support.
Choi, 2015	To identify domains of spousal support in diabetic self-care	Qualitative	Korean immigrants with T2DM (n = 16), spouses (n = 17), (total n = 33) Age 60↑	Orange County, California	Six domains identified: diet, exercise, emotional support, medical regimen, communication with clinicians, & information. Diet was the most frequently described across all groups. Individualizing spousal support and recognizing diabetes management as teamwork is an important elements of successful spousal support.
Chun, 2011	To examine how acculturation affects T2DM management and perceived health for Chinese immigrants in the U.S.	Qualitative	Chinese immigrants from China or Hong Kong (n = 19) Age: 52-71	San Francisco	Three key themes were identified: utilizing health care, maintaining family relations and roles, and establishing community ties and groundedness.
Chun, 2016	To examine effects of bicultural efficacy, or perceived confidence in dealing with bicultural acculturation stressors, on T2DM management and health for Cantonese-speaking Chinese immigrants	Quantitative	Chinese immigrants (n = 162) Age: 51-70	San Francisco Bay area	Longer diabetes diagnosis duration was related to greater DQOL-S and using insulin was related to higher DQOL-I. Proxy and general acculturation measures and social support were significantly related to DQOL-S and DQOL-I. Proxy and general acculturation measures and social support were not significantly related to diabetes distress.
Hu, 2013	To explore perceived barriers among Hispanic immigrants with diabetes and their family members	Qualitative	Hispanic immigrants with T2DM (n = 73) Age: 49-61	In North Carolina	Barriers to diabetes self-management were in 3 major themes categorized as: suffering from diabetes, difficulties in managing the disease (difficulty & frustrations taking medications, hard to control diet, difficulty with exercise), and lack of resources/support.
Iten, 2014	To investigate the relationship b/t immigration status and the patient experience of health care, DM self-management, and outcomes among Mexican immigrants with diabetes.	Quantitative	Mexican immigrants with T2DM (n = 401) Age: 37-66	In two immigration sanctuary cities: San Francisco Bay & Chicago	There were no statistically significant differences b/t three groups (US-born, documented, undocumented) on physician trust or reports of positive physician communication. Diabetes self-care behaviors did not differ b/t the three groups. Documented and undocumented are 1.2 and 1.2 times more than US-born to perceive higher level of these barriers to diet and medication adherence.
Joo, 2016	To explore barriers & facilitators of diabetes self-care among Korean senior immigrants with T2DM	Qualitative	Korean elderly immigrants with T2DM (n = 23) Age: 66-71,.	Midwest	Five perceived barriers: the high cost T2DM care, language barriers, loss of self-control, memory loss, & limited access to healthcare resources. Three facilitators: time, seeking information, & family & peer supports

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Table 1. Continued

Author, Year	Purpose	Design	Participants	Geographic location	Findings
Kindarara, 2017	To describe Sub-Saharan African immigrants' health illness transition experience r/t T2DM self-management.	Qualitative	Sub-Saharan African immigrants (n = 10) Age: 44-76	Sacramento County, California	Four overarching domains were identified: knowledge of T2DM self-management behaviors, current T2DM self-management behaviors, inhibitors of T2DM self-management, and facilitators of T2DM self-management
Magny-Normilus, 2020	To explore and describe the lived experience of adult Haitian immigrants with T2DM in the U.S.	Qualitative	Haitian immigrants (n = 16) Age: 40-63	Northeastern	Four themes were identified: self-reliance, spirituality, nostalgia for home, a desire for positive patients-provider relationships
McConatha, 2020	To examine how aspects of culture, social support, isolation, & loneliness are perceived as influences in T2DM or pre-diabetes among Middle Eastern immigrants.	Qualitative	Middle Eastern immigrants (n = 28) Immigrants from Iran, Turkey, and Lebanon Age: 60-80	Philadelphia area	All participants reported increased feelings of isolation, loneliness because the illness requires many lifestyle changes. Avoiding traditional ethnic food can be highly stressful. Identified themes: 1) vulnerability, anxiety, & stress associated with making lifestyle changes, 2) relationship & social support challenges, & 3) Cultural disconnection, loneliness, & social isolation
Nam, 2013	To examine challenges in diabetes self-management among Korean immigrants with T2DM	Qualitative	Korean immigrants with T2DM (n = 23) Age: 30-75	U.S.	Social stigma. Diabetes management is not always a top priority for Korean immigrants over other family obligations or financial stability in their busy immigration lives. Conflict with family members in managing diabetes or would not request support from family member for diabetes care. Korean women are more vulnerable to a lack of self-care. Lack of English proficiency limits access to mainstream health care
Njeru, 2016	To assess diabetes knowledge, attitudes, and behaviors of Somali and Latino immigrants with T2DM	Quantitative	Somali and Latino (n = 78) each group 39 mean age: 52	Rochester, Southeast Minnesota	Respondents reported that diabetes had significant social impacts on normal activities, including travelling, physical activity, food and relationships. Among Latino participants, cost was noted to be a significant barrier to diabetes care.
Park, 2016	To evaluate the components of East Asian DM self-management interventions.	Mixed-study review	Articles (n = 16) Immigrants from China, Japan, South Korea, and Taiwan Age: 55-65	U.S.	From 9 qualitative studies, two overarching themes were identified including cultural beliefs and immigration-related challenges.
Smith-Miller, 2016	To describe the quantitative findings of a mixed-methods study that examined the relationship among knowledge, self-efficacy, health promoting behaviors, and T2DM self-management among Spanish-speaking Hispanic immigrants	Mixed-methods study	Hispanic immigrants (n = 30) Age: 27-86	U.S.	Participants were not effectively managing diabetes. The results based on three SEM models suggest that effective intervention strategies need to focus on improving knowledge, nutrition, and physical activity, reducing stress, and leveraging the importance of interpersonal relationships.

tant to disclose their diabetes to their friends and are distressed when the topic is brought up at social gatherings. Additionally, McConatha and colleagues [25] reported that dietary modification was a source of stress. For immigrants from the Middle East, family gatherings involve sharing large, traditional meals. The ceremonial meals and family gatherings are a source of family pride and heritage because they serve as a symbolic link to their homelands. However, their traditional dishes typically contain a great deal of carbohydrates.

In addition, if a guest does not consume a substantial amount of food, it may reflect negatively on the host's hospitality. When Kindarara and colleagues investigated the experiences of Sub-Saharan African immigrants with diabetes self-care, the majority of participants reported dietary difficulties [23]. These immigrants struggled to adjust to not eating rice and consuming fewer of their traditional foods. One participant noted that not eating favorite foods, not craving high-carbohydrate foods, and adopting a diabetic diet were obstacles; they noted that in their culture, they do not feel satisfied if they do not eat rice. They felt loss when staple native foods were reduced or eliminated. Across these diverse cultures, dietary modification was identified as a significant diabetes management challenge. According to several participants in Hu's [20] study, adjusting their own methods of food preparation and consumption was the most difficult diabetes-related obstacle.

Low Economic Status and Health Insurance

In the U.S., immigrant T2D self-care is influenced by their low socioeconomic status and lack of health insurance [14,16,18, 23,26]. The research conducted by Chun and colleagues revealed that immigrant participants had to deal with economic hardships and poverty in the United States, which increased their acculturative stress [14]. By limiting their access to health care services, the financial hardship had a direct and negative impact on their ability to self-manage their diabetes. One participant in the study reported feeling "caught between two worlds." They were not eligible for government health care subsidies and could not afford comprehensive health insurance. They felt socially excluded and anxious about their diabetes treatment and overall health. In a study by Njeru [26], Latino respondents reported that the cost of managing T2D was a significant barrier. The elderly participants of Joo's [18] study reported having financial difficulties due to the high cost of diabetes care. The majority of study participants were retired and lived on fixed incomes. Despite receiving social security benefits and assistance from their children, they felt overwhelmed by diabetes-related costs. Kindarara and colleagues also found that a lack of health insurance and a low income made it more difficult for patients to obtain medical care or adhere to diabetic diet recommendations [23].

Due to their low socioeconomic status, immigrants with diabetes must work long hours and may not have time for self-care. They consume readily available foods such as fast food [23]. Their low socioeconomic status makes it difficult for them to adhere to diabetic dietary recommendations and practice optimal self-care. According to Cha [16], the majority of Koreans who immigrate to the U.S. are relatively young and healthy, so they may not need health insurance. However, when they are diagnosed with chronic diseases such as diabetes, it is likely that they will not qualify for health insurance coverage due to the nature of their employment (e.g., small business, temporary job) or because they have a low income or a preexisting health condition. Uninsured or underinsured Korean immigrants with diabetes did not have access to the majority of new oral advanced medications or insulin. More participants with poorly controlled diabetes than those with controlled diabetes reported insurance difficulties.

Social Support and Resources

In relation to self-care among immigrants, social support and resources were discussed as factors with diverse perspectives [15-18,20,23,25].

Cha and colleagues found that young adult Korean immigrants, many of whom ran small family businesses, lacked time for diabetes self-care [16] due to their long work hours. Their primary source of social support was limited to Sunday church activities, and they reported difficulty adhering to diabetes recommendations. Older Korean immigrants relied on free or low-cost community resources in the United States, including ethnic senior daycare centers, the YMCA, Medicare and/or Medicaid programs.

Choi and colleagues examined the role of spouse support in diabetes self-care among older Korean immigrants [17]. Some spouse participants stated that their role was to encourage and assist, but that the patient was ultimately responsible for his or her own care. In contrast, other spouse participants stated that it was their duty to learn more about diabetes, assist with self-management, and provide ongoing support. Participants with diabetes and their spouses identified spousal support and recognizing diabetes self-care as a team effort as essential components of successful self-management. The results of a study conducted by Chun and colleagues revealed that participants with greater social support had lower HbA1c levels and lower levels of depression [15].

In a study of Hispanic immigrants, Hu and colleagues identified a lack of support from health care providers and family members as a significant barrier to diabetes management [20]. Participants compared their diabetes management to navigating in the dark. Participants felt helpless due to their perception that health care providers paid little attention to their disease. Participants required assistance and support from their families, but dietary issues led to family conflicts. Although family members wanted to help, they lacked the knowledge necessary to assist participants with diabetes. Due to the necessary changes in lifestyle, such as diet and exercise, patients with diabetes are unable to effectively manage self-care without family support. In addition, Hispanic immigrants with diabetes reported a lack of financial resources for disease management due to the absence of support from health care providers and families.

Kindarara and colleagues identified four subcategories of social support in diabetes self-care among immigrants from Sub-Saharan Africa [23]: (1) family and peer support, (2) provider-patient relationship, (3) spirituality, and (4) resources for T2D self-care. Family and peer support were the most frequently mentioned source of emotional support among the four subcategories of social support. Children, parents, and especially spouses provided medication reminders, monitoring, encouragement, transportation to medical appointments, and meal preparation assistance. The participants in Kindarara's [23] study also regarded the healthcare provider-patient relationship and the relationship with God as significant sources of emotional support.

According to McConatha and colleagues, despite the importance of social support for effective coping, social support is reciprocally affected by the changes patients must make to manage their illnesses [25]. About 90% of participants in McConatha's [25] study reported that changes in diet and exercise habits negatively affected their relationships with family and friends, especially during social gatherings. In addition, the participants stated that their families and friends provided them with hope and strength. Social and emotional support from family and friends was cited as the most influential factor in their ability to successfully alter their lifestyles.

Low English Proficiency

Low English proficiency was one of the immigrant diabetes self-care barriers [8, 14, 18]. Low English proficiency was a crucial acculturation stressor that limited healthcare access for Chinese immigrants with diabetes, according to Chun and colleagues [14]. Low English proficiency hindered not only communication with health care providers, but also the ability to perform daily self-care tasks, such as scheduling medical appointments and purchasing over-the-counter health products (e.g., glucose monitor patches). These diabetes self-care requirements became a source of stress and anxiety. Their sense of self-efficacy in managing diabetes and general health was diminished by language barriers. According to the research conducted by Nam [19] and Joo [18], Korean immigrants viewed the language barrier and limited access to health care services as significant obstacles to managing diabetes. The majority of Korean immigrants do not speak English, limiting their access to adequate health care services. Many Korean immigrants are unsure of the progression of their illness and are unable to participate in educational sessions due to their limited English proficiency. Even though they want to ask physicians questions, they struggle to read and comprehend information about T2D self-management.

Inadequate English proficiency restricts their access to health care services and causes discomfort in daily life. The limited access to health care services among elderly Korean immigrants with diabetes is also attributed to their lack of diabetes knowledge, which is a result of their limited English proficiency. One of the participants in Nam's [19] study reported that her mother died from a low blood sugar level. Her mother's limited English proficiency resulted in inadequate knowledge of her illness. She believed that she should avoid eating sweets to prevent high blood sugar, so she did not eat them. However, one day, she suddenly fainted and died on the way to the emergency room. Some may argue that this story is unique to elderly Korean immigrants. Nonetheless, it is evident that limited language proficiency is one of the most significant barriers to diabetes management among immigrants who did not grow up in the U.S.

Psychological Contexts: Depression, Loneliness, Social Isolation, and Unstable Emotion

Four studies [12,14,20,25] discussed psychological issues in diabetes self-care among immigrants, including depression, loneliness, social isolation, and emotional instability. In Chesla's [12] study, Chinese immigrants expressed concern about diabetic dietary restrictions. When they attempted to strictly adhere to the diabetic diet, they experienced depression and emotional imbalance. The participants also stated that life would be meaningless without delicious food. Remarkably, the Chinese immigrants had trouble adhering to the diabetic diet in Chinese restaurants, which caused them to withdraw from social interactions during meals. This circumstance impacts their social interactions, which are fundamental to their emotional health. Chesla [12] discovered that Chinese immigrants with uncontrolled glucose levels exhibited increased irritability and emotional instability, such as temper tantrums. Their irritability had a negative impact on family harmony, but their spouses felt obligated to forgive their outbursts as part of their care.

Similarly, Chinese participants in Chun's [14] study reported increased feelings of isolation, loneliness, and depression in relation to diabetes self-care. These psychological issues vary by ethnic and cultural background. For instance, in Chun's [14] study, some participants reported distinct acculturation experiences regarding filial piety and respect for the elderly since moving to the United States. Traditionally, the majority of sons and daughters in China take care of their elderly parents. However, since moving to the United States, their adult children have adopted western cultural values and weakened family ties and responsibilities. The more elderly Chinese parents fear losing family support from their adult children, while the elderly Chinese experience emotional distress and resignation regarding their unloyal offspring.

In McConatha's [25] study, all Middle Eastern immigrants reported stress and anxiety related to diabetes self-management. Their daily lives are affected by their anxiety and stress. Additionally, 90% of the participants experienced loss of personal identity and loneliness. One older participant in McConatha's [25] study reported that meal-centered social gatherings became less enjoyable and even stressful. The immigrants with diabetes were required to limit their social activities, particularly those involving alcohol and food. They perceived that their friends and family treated them differently, as if they were more fragile, which marginalized and isolated them socially. In the study conducted by Hu [20], Hispanic immigrants with diabetes also described emotional suffering such as depression, isolation from family, a sense of hopelessness, and a sense of being different in their self-care. Particularly when they experience complications associated with diabetes, such as diabetic retinopathy, they feel hopeless and despondent [20].

Gender Roles

According to the findings of two studies [19,20], female immigrants were more susceptible to diabetes management difficulties than male immigrants. Traditionally, Korean women are responsible for preparing family meals and staying at home [19]. After immigration to the United States, both men and women work long hours. As a result, many diabetic Korean immigrant women struggle to maintain their traditional roles while working hard outside the home. If a man has diabetes, he is more likely to receive assistance from his spouse in managing diabetes; however, if a woman has diabetes, she is more likely to continue preparing regular meals for her family rather than maintaining a diabetic diet for herself. Compared to Korean male immigrants, Korean female immigrants with diabetes face gender-related obstacles in effectively managing their condition. In addition, Hu [20] found that female participants with diabetes had difficulty preparing different foods for themselves compared to the food preferences of their family members. The family members of the female participants were not accustomed to a diabetic diet, so to avoid conflict, the female participants gave up their dietary restrictions.

McConatha [25] also demonstrated that female immigrants with diabetes have more difficulty altering their diet than male immigrants. The majority of male participants reported not being responsible for cooking; they relied on their spouses to successfully manage their diet. Despite the fact that female participants were better cooks than their male counterparts, they reported greater difficulty making the necessary dietary changes for diabetic self-care. According to Cha [16], when diabetic women prepare meals based on ADA recommendations, their families are unsatisfied. Therefore, the women with diabetes experience tension and conflict between their previous family diet and their new diabetes diet. Ultimately, the women with diabetes make sacrifices for their families and adhere to family-approved recipes.

According to Chun [14], male immigrants with diabetes experienced a loss of gender roles as a result of their condition. Due to diabetes-related dietary restrictions, he ate less rice, thereby diminishing his physical strength. Due to diminished physical strength, he was unable to actively fulfill his role as a provider for the household and faced gender role reversals.

Discussion

Self-care is essential for people with chronic illnesses such as T2D. However, self-care is complicated. Ineffective diabetes self-care may cause acute or long-term effects, including skin and eye complications, neuropathy, functional disability, hypertension, stroke, and death risk [6].

T2D self-care for immigrants in the U.S. is associated with their cultures and traditions. Williams [29] characterized ethnicity as "a complex multidimensional construct reflecting the convergence of biological factors, geographical origins, culture, political, economic, and legal factors." Depending on their ethnicity and culture, different approaches are required to comprehend disparities in health and health care [30]. The findings of this scoping review highlight the need for future research that investigates the factors associated with effective self-care among immigrants with diabetes in the U.S.

Dietary changes posed particular difficulties, as was a recurring theme in the reviewed articles. Dietary changes can negatively impact social gatherings and relationships with family and friends for immigrants. Due to the symbolic ties to their homelands, these traditional foods are associated with cultural pride and heritage and are shared with family and friends. Diet-related cultural conflicts influence the self-care practices of immigrants with diabetes. Additional research and health care providers are required to identify the food culture of ethnic groups and develop a diabetic diet that is culturally appropriate.

Regarding low economic status and lack of health insurance, racial and ethnic immigrants have historically been plagued by health disparities resulting from an unfair distribution of resources such as health care, education, and politics [31]. Higher morbidity and mortality rates indicate that the health of underrepresented minority groups in the U.S. has remained inferior to that of white Americans [32]. Undoubtedly, the high rates of un-insurance among ethnic minority groups indicate health disparities. Most immigrants received their education in their home countries. Therefore, they must exert more effort to work and earn a living in the U.S. than their native American counterparts. To establish themselves in a new country, the majority of them must endure hardship. Due to these barriers to immigration, their precarious economic situation and lack of health insurance make it more difficult for them to maintain optimal health. In order to have a more equitable health service system, the U.S. has been reforming its health legislation, but it still does not meet the requirements of minority immigrants. Particularly, undocumented immigrants are more vulnerable in terms of Medicaid eligibility and receiving insurance premium credits [33]. For minority immigrants to receive optimal healthcare services, healthcare providers and political legislators must collaborate.

Social support served as a predictor, a mediator, and occasionally an impediment to T2D self-care activities. The most prevalent source of social support was family and friends. In addition to family and friends, there were also churches, healthcare providers, and community-based services. However, depending on ethnicity, age, and culture, social support and resources played various roles. Most immigrants indicated that family, friends, and churches help them manage their diabetes. On the other hand, some immigrants reported conflicts with family members and friends when performing self-care activities. Their lifestyle changes affect their family and friends' life as well. Suppose family and friends are not knowledgeable about diabetes or do not understand its characteristics. In that case, they may have a bias against the person with diabetes, which could lead to dinnertime conflicts. Nevertheless, despite these conflicts, it is undeniable that lack of social support is identified as a significant barrier to diabetes self-care among immigrants [20,25]. Particularly, Asian culture emphasizes family unity more than individual needs [34]. Older Asian immigrants rely on the assistance of their adult children rather than seeking professional health care services.

This scoping review revealed that language inadequacy was one of the most important determinants of T2D self-care. Low English proficiency impeded not only communication with healthcare providers but also the acquisition of the skills necessary to perform daily self-care tasks independently. Previous works have demonstrated that language and cultural differences are obstacles when seeking adequate health care [35]. Older ethnic immigrants are likelier to have lower English proficiency than younger ones. Due to the higher prevalence of chronic disease among elderly immigrants, language translation services are more crucial for their access to health care.

Diverse factors were associated with the psychological contexts of ethnic immigrants with diabetes who practiced self-care. Changes in cultural norms, lifestyles, socioeconomic status, and language barriers all contribute to the stressful nature of immigration to a new culture. If the immigrants are elderly and arrived in the U.S. at a later age, they must face additional barriers and obstacles when performing diabetes self-care activities. They experienced anxiety, cultural disconnection, loneliness, and social isolation while attempting diabetes self-care. The psychological contexts of diabetes self-care may differ based on age, gender, socioeconomic status, and family and friend relationships. Health care providers should continue to be concerned about the psychological context-related vulnerability of immigrants with diabetes and develop effective strategies for them.

An intriguing finding of this review was the gender roles in self-care among immigrants with diabetes in the U.S. Female immigrants with diabetes typically have more difficulty maintaining traditional gender roles than their male counterparts. As mothers or wives, many immigrant women with diabetes serve their families' preferred meals rather than diabetic diet foods. Female immigrants were more susceptible to engaging in activities of self-care. Depending on the ethnic culture and family culture, however, the gender role can be discussed from various angles. Additional research is required to identify gender roles among immigrants with diabetes and to comprehend the effects of gender roles on diabetes self-care.

Limitations

Despite the thoroughness of this scoping review, this scoping review may have overlooked some relevant studies. Additional relevant studies may be searched using more specific search terms and other databases. While most studies employ qualitative methods, the findings cannot be generalized due to small samples.

This scoping review includes quantitative, qualitative, and mixed method studies. In consequence, this review lacks statistical evidence and synthesized results. There also may be a need for more consistency among the included studies as a result of combining diverse method studies into one. Moreover, there is no assessment of methodological quality or risk of bias in included studies. However, despite these limitations, this scoping review addresses broader questions and provides valuable evidence by adhering to well-defined methodological guidelines and reporting standards.

Implications

Immigrants of various racial and ethnic backgrounds living in the U.S. are identified as having diabetes. The discussions indicate the need for additional research on the health and diabetes self-care of immigrants of diverse ethnic backgrounds. In the future, researchers who share the ethnic, cultural, and linguistic perspectives of study participants are required to conduct additional research on ethnic culture sensitivity and uniqueness.

Conclusion

This scoping review described research findings pertaining to culturally specific factors in diabetes self-care among immigrants in the U.S. The review suggests that related self-care factors among ethnic immigrants with diabetes must be examined in light of their unique culture, and that health care providers should develop culturally appropriate care plans. It is the responsibility of health care professionals to assess, acknowledge, and respect a patient's culture and to consider their characteristics in order to promote optimal health.

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Conflict of interest

The authors declared no conflict of interest.

Funding

None.

Authors' contributions

Kim, Jung Eun contributed to conceptualization, formal analysis, methodology, project administration, visualization, and writing - original draft, review & editing.

Data availability

Not applicable.

Acknowledgments

None.

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   6) 0 shall be placed in front of the decimal point if the number is close to 1 and left blank if the number is not close to 1 (e.g., $t = 0.26$, $F = 0.92$, $r = .14$, $R^2 = .61$).
   7) When reporting p-values, which refer to the significance probability, footnotes shall not be used, but the actual p-values shall be provided. If the p-value is .000, it shall be indicated as $p < .001$, and if the p-value is 1.000, it shall be indicated as $p > .999$.
   8) When reporting decimal numbers, the significance level shall be rounded to three decimal places. Standard deviations, other averages and means shall be rounded to two decimal places, and percentages rounded to one decimal place (e.g., $p = .002$, 23.98 ± 3.47, 45.7%).
   9) When p-values have to be reported using footnotes, *, ** shall be used (e.g., $^{*}p < .05$, $^{**}p < .01$).

4. Figure guidelines
   1) The title of the figure shall be placed below the figure with the first letter capitalized. Separate figures shall be numbered in the order of their first appearance.
   2) When there are two or more figures for the same number, alphabets shall be placed after the Arabic number. (e.g., Figure 1-A and Figure 1-B).

5. Tables and figures shall be in sharp, black lines and adjusted to fit within the A4 size page (width 150 mm × height 200 mm) with the explanations written separately.

6. The resolution of the figures shall be more than 3 million pixels.

In-text citation

Citations of references within the text should follow Citing Medicine: The NLM (National Library of Medicine) Style Guide for Authors Editors, and Publishers 2nd edition (2007) (https://www.ncbi.nlm.nih.gov/sites/books/NBK7256/)

Use [1], [2,3], or [4-6] in the text, and they should be listed in the Reference section in numerical order of their citation.

References

1. All references cited in the text must appear in the Reference section, and all items in this section shall be cited in the text. References cited in the manuscripts such as meta-analyses and systematic reviews are presented in the appendix. Authors are responsible for the accuracy and completeness of their references and correct text citations.
2. State Journal's full name (e.g., Research in Community and Public Health Nursing). The sequence is authors, the title of the paper, journals name, year published, and volume, followed

by page numbers and the Digital Object Identifier (if it is available). For citation from other sources, refer to The NLM Style Guide for Authors, Editors, and Publishers 2nd ed. (2007) (https://www.ncbi.nlm.nih.gov/books/NBK7256/).

3. If the number exceeds six, list only the first six authors followed by et al. shall be given.

Journal article:

1. Cho OH, Yoo YS, Kim NC. Efficacy of comprehensive group rehabilitation for women with early breast cancer in South Korea. Nursing & Health Sciences. 2006; 8(3): 140-146. https://doi.org/10.1111/j.1442-2018.2006.00271.x
2. Bang KS, Kang JH, Jun MH, Kim HS, Son HM, Yu SJ, et al. Professional values in Korean undergraduate nursing students. Nurse Education Today. 2011;31(1):72-75. https://doi.org/10.1016/j.nedt.2010.03.019

Forthcoming journal articles (articles published electronically ahead of the print version):

3. Scerri J, Cassar R. Qualitative study on the placement of Huntington disease patients in a psychiatric hospital: Perceptions of Maltese nurses. Nursing & Health Sciences. 2013. Forthcoming.

Periodicals or magazines:

4. Rutan C. Creating healthy habits in children. Parish Nurse Newsletter. 2012 May 15:5-6.

Newspaper articles:

5. Cho C. Stem cell windpipe gives Korean toddlers new life. The Korea Herald. 2013 May 2; Sect. 01.
6. Lyderson K. Risk of disease rises with water temperatures. Washington Post [Internet]. 2008 Oct 20 [cited 2008 Dec 19]:A08. Available from: http://www.washingtonpost.com/wp-dyn/content/article/2008/10/19/AR2008101901533.html Article includes a correction.

Books:

7. Peate I. The student's guide to becoming a nurse. 2nd ed. Chichester WS: John Wiley & Sons; 2012. 660 p.

Parts of books (chapter):

8. Reed JG, Baxter PM. Library use: handbook for psychology. 3rd ed. Washington: American Psychological Association; c2003. Chapter 2, Selecting and defining the topic; p. 11-25.

Entire book on the Internet

9. Peterson K. Guide to life science careers [Internet]. Cambridge: NPG Education; c2014 [cited 2020 Jul 2]. Available from: https://www.nature.com/scitable/ebooks/guide-to-life-science-careers-14053951/.

Scientific and technical reports:

10. Perio MA, Brueck SE, Mueller CA. Evaluation of 2009 pandemic influenza A (H1N1) virus exposure among internal medicine house staff and fellows. Health Hazard Evaluation Report. Salt Lake City, Utah: University of Utah School of Medicine, 2010 October. Report No.: HETA 2009-0206-3117.

Dissertations and theses (This journal does not recommend citing dissertations or theses. If necessary, less than three should be cited.)

- Doctoral dissertation:

11. Jin HY. A study on the analysis of risk factors and characteristics for nosocomial infection in intensive care unit [dissertation]. [Seoul]: Yonsei University; 2005. 108 p.

- Master's thesis:

12. Kim JS. A study on fatigue, stress and burnout of pregnancy nurses [master's thesis]. [Gwangju]: Chonnam National University; 2012. 50 p.

Papers and poster sessions presented at meetings

- For a paper:

13. Bryar R. The primary health care workforce development roadmap. Paper presented at: The public health nursing contribution to primary health care 3rd International public health nursing conference; 2013 Aug 25-27; National University of Ireland Galway (NUIG). Galway.

- For a poster session:

14. Bigbee J. Promoting the health of the population: Public health nursing leading the way. Poster session presented at: The public health nursing contribution to primary health care 3rd International public health nursing conference; 2013 Aug 25-27; National University of Ireland Galway (NUIG). Galway.

Conference publications

15. Dostrovsky JO, Carr DB, Koltzenburg M, editors. Proceedings of the 10th World Congress on Pain; 2002 Aug 17-22; San Diego, CA. Seattle: IASP Press; c2003.

Citing material on the Internet

- Standard citation to an open serial database on the Internet:

16. TrialSearch [Internet]. New York: AIDS Community Research Initiative of America. c2003 - [cited 2007 Feb 1]. Available from: http://www.acria.org/.

- Standard citation to a retrieval system on the Internet:

17. WHOSIS: WHO Statistical Information System [Internet]. Geneva: World Health Organization. c2007 - [cited 2007 Feb 1]. Available from: http://www.who.int/whosis/en/.

- Standard citation to a homepage:

18. Statistics Korea. 2010 life tables for Korea [Internet]. Seoul: Statistics Korea; 2011 [cited 2012 January 16]. Available from: http://kostat.go.kr/portal/korea/kor_nw/3/index.board?bmode=read&aSeq=252533.

- Homepage with no authors or editors:

19. StatePublicHealth.org [Internet]. Washington: ASTHO; [cited 2007 Feb 23]. Available from: http://statepublichealth.org/.

Appendix

1. Authors should submit an appendix to show the developed final measurements in the instrument development study and a list of articles reviewed in the systematic review or meta-analysis research.
   1) Supplementary material: Supplementary material can support and enhance your scientific research. Supplementary files offer the author additional possibilities to publish supporting applications, high-resolution images, background datasets, sound clips, and more. Please note that such items are published online exactly as they are submitted; there is no typesetting involved (supplementary data supplied as an Excel file or as a PowerPoint slide will appear as such online).
   2) Please submit the material together with the article and supply a concise and descriptive caption for each file. If you wish to make any changes to the supplementary data during any stage of the process, please provide an updated file, and do not annotate any corrections on a previous version.
   3) Please also make sure to switch off the "Track Changes" option in any Microsoft Office files, as these will appear in the published supplementary file(s).

Data sharing and transparency

1. This journal encourages and enables you to share data that supports your research publication, where appropriate, and enables you to interlink the data with your published articles. Research data refers to the results of observations or experimentation that validate the research findings. To facilitate reproducibility and data reuse, this journal also encourages you to share your software, code, models, algorithms, protocols, methods, and other useful materials related to the project.
2. Data generated through the participation of subjects and the public should be put to maximum use by the research community and, whenever possible, translated to deliver patient benefit. Data sharing benefits numerous research-related activities: reproducing analyses; testing secondary hypotheses; developing and evaluating novel statistical methods; teaching; aiding design of future trials; meta-analyses; helping to prevent error, fraud, and selective reporting.
3. To promote more transparent and reproducible research, we ask authors to submit a Data Availability Statement in the manuscript to help authors understand how they can access the data, code and other resources that support the research findings.
4. The following are examples of data-sharing statements:
   Example 1. Data can be obtained from the corresponding author.
   Example 2. Data can be obtained from the supplementary material link.
   Example 3. (In the case of health care big data) Data can be obtained from (the name of the)___repository source.

Registration of a Clinical Trial

1. A clinical trial is defined as "any research project that prospectively assigns human subjects to intervention and comparison groups to study the cause-and-effect relationship between a medical intervention and a health outcome." We encourage the prospective registration of studies. Where a study has been registered, please give the number on your title page and include the registration number within the body of the paper as appropriate.
2. The journal accepts the registration in any of the primary registries that participate in the World Health Organization International Clinical Trials Portal (http://www.who.int/ictrp/en/), the National Institutes of Health ClinicalTrials.gov (https://clinicaltrials.gov/), the International Standard Randomized Controlled Trial Number Registry (https://www.isrctn.com/), or the Clinical Research Information Service, Korea Disease

Control and Prevention Agency (KDCA) (https://cris.nih.go.kr/cris/info/introduce.do).

3. This journal follows the data sharing policy described in “Data Sharing Statements for Clinical Trials: A Requirement of the International Committee of Medical Journal Editors” (https://doi.org/10.3346/jkms.2017.32.7.1051). As of July 1, 2018, manuscripts submitted to ICMJE journals that report the results of interventional clinical trials must contain a data-sharing statement. Clinical trials that began enrolling participants on or after January 1, 2019, must include a data-sharing plan when registering the trial. The ICMJE’s policy regarding trial registration is explained at http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/clinical-trial-registration.html.
4. The journal follows the data-sharing policy described in “Data-sharing Statements for Clinical Trials: A Requirement of the International Committee of Medical Journal Editors (ICMJE)” (https://doi.org/10.3346/jkms.2017.32.7.1051) (http://icmje.org/icmje-recommendations.pdf).
5. If the data-sharing plan changes after registration, this should be reflected in the statement submitted and published with the manuscript and updated in the registry record. Based on the degree of the sharing plan, authors should deposit their data after de-identification and report the digital object identifier, or DOI, of the data and the registered site.

Reporting Guidance for Specific Study designs

For the specific study design, such as randomized control studies, studies of diagnostic accuracy, meta-analyses, observational studies, and non-randomized studies, it is recommended that the authors follow the reporting guidelines (https://www.equator-network.org/).

Editorial and peer-review process

1. Submitted manuscript

1) All contributions (including solicited articles) are critically reviewed by the Editorial Board members and reviewers. The decision to publish a paper is based on an editorial assessment and peer review.
2) Prereview: Initially, all papers are assessed by an editorial committee consisting of members of the editorial team. The primary purpose is to decide whether to send a paper for peer review and to give a rapid decision on those that are not put forward.
3) Review: Manuscripts going forward to the review process are reviewed by two or more reviewers and the editor. The Editorial Board reserves the right to refuse any material for publication. The Editor-in-Chief reserves the right to the final decision regarding acceptance. RCPHN uses a double-blinded review. The names of the reviewers will thus not be disclosed to the author submitting a paper, and the name(s) of the author(s) will not be disclosed to the reviewers.
4) The average time from manuscript submission to the author’s receipt of the editor’s decision about publication is approximately three months. Many excellent manuscripts are accepted, some pending minor revisions. Many other excellent manuscripts may receive a “revise and resubmit” decision.

2. Revised manuscript

1) When you prepare a revised version of your manuscript, you should carefully follow the instructions given in the Editor’s letter. Authors are encouraged to follow the suggestions made by the reviewers to make changes and then resubmit with a detailed letter to the editor outlining the changes made following the reviewers’ suggestions. Revised submission must also include a point-by-point response to reviewer comments and a traced-changed version of the revised manuscript.
2) Revised manuscripts must be uploaded within two weeks of authors being notified of conditional acceptance pending satisfactory revision.
3) Authors who are responsive to the reviewers’ suggestions are well placed to have their manuscripts accepted for publication.
4) The revised manuscript should have changes highlighted (either by using the “Track Changes” function in MS Word or by highlighting or underlining the text) with notes in the text referring to the editor or reviewer query.

After acceptance of a manuscript

1. Paper proof

1) RCPHN provides the corresponding author with paper proofs for their correction. The corresponding author will receive electronic page proofs to check the copyedited and typeset article before publication. Corrections should be kept to a minimum.
2) The Editor retains the prerogative to question minor stylistic alterations and major alterations that might affect the scientific content of the paper. Any fault found after the publication is the authors’ responsibility.

3) We urge our authors to proofread their accepted manuscripts carefully. The corresponding author may be contacted by the Editorial Office, depending on the nature of the correction in the proof.

2. Publication fee

1) Authors are asked to pay a fee to allow perpetual, unrestricted online access to their published articles for readers globally, immediately upon publication to cover some part of the costs associated with publication, depending on the number of pages of the published article.

2) The publication charges are 60,000 won (50 US dollars) per printed page.

3. Errata and Corrigenda

1) An erratum will be used if a significant error has been introduced by us during the production of the journal article, including errors of omission such as failure to make factual proof corrections requested by authors within the deadline provided by the journal and within journal policy. A 'significant error' is one that affects the scholarly record, the scientific integrity of the article, the reputation of the authors, or of the journal.

2) A corrigendum is a notification of an important error made by the author(s) that affects the publication record or the scientific integrity of the paper, or the reputation of the authors or the journal.

3) We will publish a correction of your article if a significant or important error is discovered after publication.

Additional clauses

These regulations are effective from March 24, 2023.

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Author's Check List

Please check below items before submission of the manuscript.

Publication Ethics

☐ This manuscript is not duplicated, and it follows the ethical guidelines of the Research in Community and Public Health Nursing.
☐ Deliberation of the Institutional Ethics Committee (excludes review and editorial)

Title page

☐ Use the title page template.

Manuscript preparation

☐ Delete the personal information of the author from the file name or the contents of the manuscript.
☐ A4 MS word with 1- inch margin on all sides.
☐ The font shall be in size 12-point batang or 12 point Times New Romans font. The line spacing shall be double-spaced or 200%.
☐ Put page numbers at the bottom.

Abstract

☐ 250 words or less
☐ Use the sub-titles of Purpose, Methods, Results, and Conclusion.
☐ English keywords: Use 3 to 5 words registered in MeSH in principle.

Main text

☐ Title, English abstract, keywords, main text (introduction, methods, results, discussion, conclusion), reference, tables, and figures in order
☐ The total volume of the manuscript: 20 pages or fewer (excluding title, abstract, reference, appendix)

Reference

☐ Follow the instructions for authors (NLM style): including the DOI and the full name of the journal.

Tables and figures

☐ Follow the instructions for authors.
☐ They must be written in English.
☐ The numbers shall be the same as those in the body without typographical errors.

RCPHN
Research in Community and Public Health Nursing

Statement of Copyright & Conflict of Interest

1. Transfer of copyright

If this manuscript is published in the Research in Community and Public Health Nursing, its copyright is transferred to the Korean Academy of Community Health Nursing, and the Korean Academy of Community Health Nursing will have the copyright for the concerned manuscript as well as the right to transmit the digital data. The author possesses all the rights except for the copyright, including the right to use all or a part of this manuscript for application for a patent or writing a future thesis. The author may use the material of this manuscript in another manuscript after obtaining written approval. All the authors of this manuscript made practical and intelligent contributions to this manuscript and share public responsibility for the contents of this manuscript. In addition, this manuscript has not been published by or submitted to another academic journal and is not being considered by any other academic journal.

2. Clear statement of interests

The author(s) of this manuscript clearly stated all the interests related to this manuscript, including financial interests (benefit of research funding, employment, possession of stocks, speaker's fees or consultancy fees, material support, etc.) and personal interests (concurrent position, conflict of interest, conflict in intellectual property rights, etc.).

Title of submitted manuscript: ____________________

Date ____________________

Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________
Author's Name ____________________	Author's Signature ____________________

(USE A CONTINUATION SHEET IF NECESSARY FOR ADDITIONAL SIGNATURE.)

Instructions for editors

Article 1

The purpose of these guidelines is to regulate the operation of the Editorial Board (hereinafter referred to as 'the Board') organized according to Article 7 (Committee) of the Bylaws of the Korean Academy of Community Health Nursing.

Article 2

The Board has 7 to 15 members, including the Editor-in-Chief and the Executive Editor, and Associate Executive Editor.

The Editor-in-Chief organizes the Board by recommending the members and obtaining the approval of the Executive Board.

Article 3

1. (Qualifications) The Editor-in-Chief is recommended by the Directors of the Academy in the current and next terms according to the member selection criteria.
2. (Criteria for member selection) One who is experienced in publishing in journals (candidates) registered in the Korea Research Foundation; one who is experienced in publishing in international academic journals; one who is experienced in editing and reviewing for a journal registered in the Korea Research Foundation; and one who has never been subjected to disciplinary punishment related to research and publication ethics.
3. (Procedure) The Director of the Academy or the Editor-in-Chief recommends those satisfying the member selection criteria among the professors at nursing colleges (departments) throughout the country. The Editor-in-Chief then reviews and selects the member candidates of the Board. The Board of Directors approves the candidates, and the Director of the Academy appoints them as the Board members.
4. (Term) The term of the Editor-in-Chief and the members of the Board is two years, and they may be reappointed.

Article 4

The Board deliberates on and decides the following matters for publishing the Research in Community and Public Health Nursing and related academic materials and reporting the results to the Executive Board.

1. Publishing the journal
   (1) Matters on editing
   (2) Review of received manuscripts and decision on whether to publish
   (3) Decision on the article processing charge
2. Issuing academic materials
   (1) Matters on editing and publishing
3. Managing the quality of the Research in Community and Public Health Nursing
   (1) Preparation for the evaluation of journal registered in the Korea Research Foundation
   (2) Preparation for evaluation by KoreaMed
   (3) Maintenance and management of CINAHL registration
   (4) Maintenance and management of SCOPUS registration
4. Regulations related to publishing
5. Matters referred to by the Board of Directors

Article 5

The Board selects and manages the reviewers.

1. (Qualifications) The reviewers are selected according to the following criteria.

A reviewer should be experienced in reviewing for a journal (candidate) registered in the Korea Research Foundation, have a doctoral degree, is a university professor or in an equivalent position, and is familiar with recent advances in each research area.

2. (Number) The number of reviewers shall be around 150, including English proofreaders.
3. (Procedure) The members of the Board recommend candidates among professors at nursing colleges (departments) throughout the country who satisfy the reviewer qualifications, and the Editorial Board reviews and selects among them. The Board of Directors approves them, and the Director of the Academy appoints them as reviewers.
4. (Term) The term of a reviewer is two years, and they may be reappointed.
5. (Special reviewer) If external reviewers are required for a special review of a dissertation, the Editor-in-Chief may appoint special reviewers and entrust them with the review of the dissertation.
6. The review of the manuscript follows separate regulations on review.

Additional Clauses

These guidelines were effective from March 24, 2023.

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Research in Community and Public Health Nursing

Criteria for Review

Title: ____

Rate this manuscript on the following criteria using the scale of 1 (lowest) to 5 (highest), then enter your comments in the text boxes below.

Score Items	1	2	3	4	5	N/A
Originality of the contribution						
Well written: organized, correct grammar and punctuation						
Significance to population health, nursing practice, and nursing science						
Research Question(s) and Purpose of Study: clearly explicated?						
Methodology: appropriate research design used and described in depth; setting(s) and selection criteria of the participants adequately described; valid and reliable instruments used; ethical issues considered; IRB approval acknowledged						
Findings: comprehensive and clearly described; linked with research questions; tables used appropriately and constructively						
Discussion/Conclusions: based on the data presented; linked with the current literature						
Reference: Does the research mostly use recently published references?						

Date : ____________________

Reviewer : ______________

RCPHN
Research in Community and Public Health Nursing

Instructions for reviewers

We believe that peer review is the foundation for safeguarding the quality and integrity of scientific and scholarly research. This is a guideline for reviewers who voluntarily participate in the peer review process of Research in Community and Public Health Nursing (RCPHN). All of the journal's contents including commissioned manuscripts are subject to peer-review.

1. According to the Bylaws of the Korean Academy of Community Health Nursing and the Regulations on the Editorial Board of KACHN, these guidelines are provided for the review of manuscript submitted to RCPHN.
2. Manuscripts are reviewed and accepted according to these guidelines
3. Manuscripts to be reviewed should be research papers related to community nursing, and dissertations for a master's or doctoral degree goes through the same review procedure. However, the reviewing process may be different in the case of special papers that are contributed to the development of community and public health nursing.
4. Manuscripts not complying with the qualifications and regulations related to the contribution will be rejected.
5. Role of the reviewers: The peer-reviewer's role is to advise editors on individual manuscript to revise, accept, or reject. Judgments should be objective, and comments should be described lucidly. Scientific soundness is the most important value of the journal. Therefore, logic and statistical analysis should be considered meticulously. The use of reporting guidelines is recommended for review. Reviewers should have no conflicts of interest. Reviewers should point out relevant published work that is not yet cited. Reviewed articles are managed confidentially. The editorial board is responsible for the final decision to accept or reject a manuscript based on the reviewers' comments..
6. How to become a reviewer: Reviewers are usually invited by the editorial board or recommended by authors. Anyone who wishes to work voluntarily as a reviewer can contact the editorial office.
7. Two or more reviewers are assigned to each manuscript and the reviewers are appointed by the Editorial Board.
8. Accepting an invitation to review: The Editors will invite you to review because they believe that you are an expert in a certain area. They would have judged this from your previous publication record or conference/posters sessions. Before you accept an invitation to review a paper, you should consider The following:
   · Are you qualified?
   You should decline to review the manuscript if it is too far outside your area.
   · Do you have time?
   If review comments cannot be submitted within the three weeks review period, please decline to review the manuscript or ask for an extension.
   · Are there any potential conflicts of interest?
   In case of any conflicts of interest, the reviewer should decline to review. The conflicts of interest should be disclosed if the reviewer still wishes to review.
9. Double Blind Peer Review: RCPHN adopts double blind review which means that the reviewer cannot identify author information and authors cannot identify reviewers, too.
10. Manuscript are reviewed according to the 'criteria for review'. The reviewer writes their review comments
    1) Criteria for review: Review table with 8 items (Originality, Well written, Significance, Research Question(s) and Purpose of Study, Methodology, Findings, Discussion/Conclusions, and References) using the scale of 1 (lowest) to 5 (highest) (if it is not applicable, check N/A) is provided for the reviewer's convenience.
    2) Comment to authors: Summarize the whole content of the manuscript in one sentence. Mention the strengths of the manuscript, and any problems that make you believe it should not be published, or that would need to be corrected to make it publishable.
    3) Comment to editor: Both the strength and weaknesses of the manuscript should be added. The reviewer's recommendation on acceptance may be added here, including any other opinions to the editor.
11. Ethical Guidelines for Reviewers
    1) Any information acquired during the review process is confidential.
    2) Please inform the editor of any conflicts of interest, such as
       - Reviewer is a competitor.
       - Reviewer may have some antipathy with the author(s).
       - Reviewer may profit financially from the work.

       In case of any of the above conflicts of interest, the reviewer should decline to review. The conflicts of interest should be disclosed if the reviewer still wishes to review. A history of collaboration with the authors or any intimate relationship with the authors does not preclude the review.

3) Reviewer should not use any material or data originating from the manuscript in review; however, it is possible to use the open data of the manuscript after publication.

12. The review procedures are as follows:
    1) The Editor-in-Chief chooses two or more reviewers and one editor online based on their research specialty.
    2) The reviewers examine the manuscript online and input the evaluation results, what to revise, and what needs to be supplemented in three weeks.
    3) The reviewers should keep confidential the fact that they have reviewed the manuscript.
    4) The results of the review by the two or more reviewers are deliberated by the editorial board, and the editorial Board makes the final decision.
13. Based on the review, the reviewers make general opinions and detailed reports, and decide one of the following: 'Accept,' 'Minor Revision,' 'Major Revision,' and 'Reject.'
14. Based on the two or more reviewers' review results, the Editorial Board decides whether to accept the manuscript.
    1) Accept: Accept without revision.
    2) Minor Revision: The authors should revise as commented by the reviewers, and the reviewers confirm the revisions.
    3) Major Revision: The authors should revise as commented by the reviewers, and the reviewers review the manuscript and decide whether to accept it.
    4) Reject: Only if the contents of the manuscript fall into any of the cases listed below:
        ① The research theme is not original or lacks the significance of nursing.
        ② The contents are plagiarized from previous studies.
        ③ The reliability or validity of the research results is questioned.
        ④ In the evaluation criteria, more than 30% of the items were graded 'Lowest.'
        ⑤ It is considered impossible to revise.
15. The contents of the review shall not be disclosed to anybody other than the author.
16. The editorial board finally decides whether to publish the manuscript by combining the review results of the two or more reviewers and the review results of the editors.
17. If the authors fail to submit a revised manuscript within two weeks from the date of revision request by the Board, it is regarded as being withdrawn (If the author requests an extension, the due date may be extended for another month).

Additional Clauses

These regulations are effective from March 24, 2023.

RCPHN
Research in Community and Public Health Nursing

한국지역사회간호학회 회칙

2006년 12월 12일 전면 개정
2011년 12월 10일 개정
2017년 01월 16일 개정
2017년 12월 14일 개정
2018년 12월 20일 개정
2022년 02월 21일 개정

제1장 총칙

제1조 (명칭) 본 회는 한국지역사회간호학회라 칭한다.

제2조 (목적) 본 회는 지역사회 간호학의 학문적 발전을 위해 교육과 연구에 관한 학술과 정책 활동을 도모하고 회원간 학술적 교류를 목적으로 한다.

제3조 (사무소 소재지) 본 회 사무소는 본회 학회장 소속 기관에 둔다.

제4조 (사업) 제1장 제2조의 목적을 달성하기 위하여 다음의 사업을 행한다.

1. 연구 활동
2. 국내외 학술활동 및 교류
3. 학술 및 홍보활동
4. 학회지 발간 및 출판사업
5. 간호교육 발전을 위한 활동
6. 기타사업

제2장 회원

제5조 (회원자격)

① 본 학회의 회원은 본 법인에 등록을 마친 자로 한다.

② 본 학회의 회원은 다음과 같이 구분한다.

1. 정회원은 간호학을 전공한 자로서 학사학위 이상의 소지자로 한다.
2. 준회원은 본 학회의 목적에 동의하는 자로 한다.
3. 명예회원은 간호학 발전에 공헌이 있는 개인 혹은 기관으로서 실행이사회에서 추대된 자로 한다.

제6조 (회원의 권리와 의무)

① 본 학회의 회원은 정관을 준수하고 다음과 같이 소정의 회비 납부와 본 학회의 사업에 적극 참여할 의무를 갖는다.

1. 정회원과 준회원은 입회비 및 회비를 본 학회에 납부하여야 한다.
2. 정회원은 선거권과 피선거권을 갖는다. 단, 선거예정일로부터 1년 이상 정회원 자격을 유지한 자로 한다.
3. 회원은 본 학회가 제공하는 학회지, 학술정보 등 각종혜택을 받을 권리를 갖는다.

② 본 학회의 회원은 1개 이상의 회원 학회에 가입할 수 있으며 회원이 회원 학회에 복수가입을 원할 경우에는 온라인 가입 후 복수회비를 본 법인에 납부하여야 한다.

제7조 (회원의 탈퇴)

① 회원은 회장에게 탈퇴의사를 서면으로 통고함으로써 본 법인을 임의로 탈퇴할 수 있다.

② 회원이 탈퇴해도 이미 납부한 회비는 반환되지 않는다.

제8조 (회원의 제명)

본 학회의 회원으로서 본 법인의 목적에 배치되는 행위 또는 명예·위신 등의 손상을 가져오는 행위를 하였을 때에는 이사회의 의결로써 회장이 제명할 수 있다.

제3장 조직 및 임원

제9조 (임원) 본회에는 다음과 같은 임원을 둔다.

1. 회장 1명
2. 부회장 1명
3. 총무이사 1명
4. 서기이사 1명
5. 재정이사 1명
6. 학술이사 1명
7. 교육이사 1명
8. 편집이사 1명
9. 출판이사 2명
10. 홍보이사 1명
11. 국제교류이사 2명
12. 정책이사 1명
13. 감사 2명
14. 당연직 이사

제10조 (임원의 직무)

1. 회장은 본회를 대표하고 회무를 정리하며, 본회의의 의장이 된다.
2. 부회장은 회장과 협력하여 본회의 제반 사업 활동을 처리한다.

3. 총무이사는 본회의 일반 제질 활동을 총괄한다.
4. 서기이사는 본회의 회의록을 기록하고, 보고하며, 제반 서류를 보관한다.
5. 재정이사는 본회의 재정을 담당한다.
6. 학술이사는 본회의 학술활동을 총괄한다.
7. 교육이사는 본회의 교육활동을 총괄한다.
8. 편집이사는 본회의 학술활동을 위한 출판을 총괄한다.
9. 출판이사는 본회의 문제은행 관리, 출판활동을 총괄한다.
10. 홍보이사는 본회의 홍보활동을 담당한다.
11. 국제교류이사는 본회의 국제교류활동을 담당한다.
12. 정책이사는 본회 관련된 정책 활동을 담당한다.
13. 감사는 본회 회무 및 재정을 담당한다.
14. 당연직이사는 분야별 학회장과 단체의 장, 지역 지부장으로 한다.

제11조(위원회, 지부, 분야별 학회와 분야별 단체)

1. 본회의 조직과 활동을 위해 별도의 위원회를 둘 수 있다. 위원회의 운영에 관해서는 별도의 규정을 둔다.
2. 본회는 지부, 분야별 학회, 분야별 단체를 둘 수 있다.
3. 지부, 분야별 학회 및 분야별 단체의 운영을 위하여 별도의 규정을 둔다.

제12조(임원의 선임)

1. 회장은 총회에서 출석인원 과반수의 득표로 선출한다.
2. 부회장은 차기 회장 지역의 지역사회 간호학 교수 중 추대된 자로 한다.
3. 감사는 총회에서 선출하되 다수득표자로 정한다.
4. 임원(총무, 학술, 정책, 교육, 편집, 출판, 서기, 재정, 홍보, 국제교류)은 회장이 정하고 재적 총투표자의 다수결에 의한다.

제13조 (임원의 임기)

1. 임원의 임기는 2년이다.
2. 임원의 동일한 직에 1회에 한하여 중임할 수 있다. 임원 중 결원이 있을 때에 회장을 제외하고는 임원회에 서 이를 보선하며 임기는 잔여기간으로 한다.

제4장 회의

제17조 (구성) 본회는 정기총회, 임시총회, 이사회를 둔다.

제18조 (총회의 소집)

정기총회는 매년 12월, 임시총회는 회장이 필요하다고 인정하였을 때 또는 회원 3분의 1이상의 요구가 있을 때 회장이 이를 소집한다.

제19조(총회의 기능)

정기총회는 다음사항을 관장한다.

1. 회칙개정
2. 예산, 결산
3. 임원선거
4. 사업계획
5. 기타 안건 토의

제5장 재정

제21조(재정) 본회의 재정은 다음과 같이 충당 한다.

한국간호과학회로부터 본회에 등록된 회원의 연회비 중일정액을 지급받는다. 지급받은 회비와 찬조금, 기타 사업조성금으로 재정을 충당한다.

제22조(회계연도) 본회의 회계연도는 12월 1일부터 11월 30일로 한다.

부칙

제1조 본회 회칙은 총회 재적 3분의 2이상의 결의로서 수정할 수 있다.

제2조 본회 회칙은 정기총회에서 개정통과일로부터 시행한다.

제3조 기타 본 회칙에 규정되지 아니한 사항은 일반 관례에 따른다.

제4조 한국간호과학회의 인준을 받은 후 2018년 1월 1일부터 시행한다.

부칙 < 2018.12.20. >

제1조 (시행일)

본 회칙은 한국간호과학회의 인준을 받은 날로부터 시행한다.