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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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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 $\alpha = .05$, 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, occupation-

al 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 (β = .19, p = .002), hope (β = .50, p < .001), cohabitation with colleagues (β = .16, p = .003), and sleep hour (β = .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	

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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 ($\beta = .50$, $p < .001$) 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.

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 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

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 men-

tal 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.

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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.

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