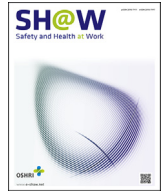




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Original article

# Occupational Characteristics and Health Status of Vietnamese Male Migrant Workers in the Republic of Korea

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## ABSTRACT

**Background:** The objective of this study is to identify the working conditions and health status of Vietnamese male migrant workers in Republic of Korea, in comparison to the Korean general population. **Methods:** We conducted our survey through the Migrant People Center, and we received completed questionnaires from 87 male Vietnamese migrant workers. The questionnaire employed was identical to those used in the Korean Working Conditions Survey and the 2020 Korea National Health and Nutrition Examination Survey. The collected data from the Vietnamese migrant workers was then compared with the Korean reference population using indirect age-standardization.

**Results:** Vietnamese male workers demonstrated a higher prevalence of health problems including hearing problems (age-standardized prevalence ratio (aSPR) 13.22, 95% confidence interval [CI]: 8.07–20.4), skin problems (aSPR 13.49, 95% CI: 8.07–20.4), and low back pain (aSPR 8.40, 95% CI: 6.50–10.69). Elevated exposure to workplace hazards such as chemicals (aSPR 2.36, 95% CI: 1.51–3.51), organic solvents (aSPR 2.22, 95% CI: 1.44–3.28), handling of heavy objects (aSPR 1.67, 95% CI: 1.24–2.21), and high temperatures (aSPR 1.96, 95% CI: 1.46–2.57) was observed among them. Additionally, they faced a higher risk of no personal protective equipment (aSPR 2.53, 95% CI: 1.26–4.52) and a greater prevalence of unmet medical needs (aSPR 7.14, 95% CI: 4.74–10.32).

**Conclusion:** Our findings highlight the elevated workplace hazards, health problems, and unmet medical needs among Vietnamese male workers compared to the Korean reference population. These findings underscores the urgency for enhanced scrutiny over working conditions and protective equipment provision, coupled with efforts to improve healthcare accessibility and worker education.

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## 1. Introduction

The term “migrant worker” refers to a person who plans or intends to engage in paid activities in a country other than one in which he or she has acquired nationality [1]. Since the 1988 Summer Olympics in Seoul, the Republic of Korea has imported labor

from abroad [2], with the foreign worker Employment Permit System and the Visiting Employment System of foreign workers being established in 2004 and 2007, respectively. The number of migrant workers has continued to increase owing to the Republic of Korea's aging population, low birth rate, and nationals' avoidance of dirty, dangerous, and demeaning industries [3]. Since most migrant

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workers are engaged in high-intensity manual labor in small and medium enterprises that Koreans avoid [4], it is virtually impossible to operate these enterprises in the Republic of Korea without them.

In the Republic of Korea, various topics related to migrant workers have been studied, and some studies on the health of migrant workers have been published since the 2000s [5–8]. Various issues such as physical and oral health [5], mental health [6], accessibility [7], and drinking [8] have been investigated, but relatively little attention has been paid to occupational risks and institutions.

Most migrant workers in the Republic of Korea are manual workers who suffer from musculoskeletal diseases and injuries owing to their occupational demands [9]. However, even in this working environment, it is difficult for migrant workers to change their workplace [10]. The system limits the number of workplace changes for migrant workers, and workplace changes are only possible for reasons recognized by the state, such as health problems or working condition violations. Few studies have been conducted on migrant workers in this situation as it is difficult for them to advocate for the basic right of changing their workplace [11]. This study focused on the health and occupational problems faced by migrant workers in the Republic of Korea. Considering the differences across countries, we conducted research by selecting Vietnamese workers as a representative nationality of migrant workers. According to the Ministry of Employment and Labor, Vietnam had the third highest number of migrant workers (on an E-9 visa) staying in the Republic of Korea as of November 2022 at 30,078, showing a 7.6% increase compared with the same month last year [12]. Research on migrant workers in the Republic of Korea has been mainly conducted on heterogenous population of various nationalities [13], but there has yet to be a study on the working conditions and health of Vietnamese migrant workers, who account for a high proportion of migrant workers staying in the Republic of Korea. Therefore, the objective of this study is to identify the working conditions and health status of Vietnamese male migrant workers in the Republic of Korea, in comparison to Korean general population.

## 2. Materials and methods

### 2.1. Participants and data collection

Our study was conducted in collaboration with the Vietnamese migrant people center. Through this partnership, we widely disseminated information about our research to Vietnamese migrant workers, aiming to gather voluntary participants for our study. Our research was specifically focused on Vietnamese male migrant workers who are 20 years old or above. Recruitment and data collection were carried out from October 1 to November 4, 2022. During this period, 87 Vietnamese male migrant workers voluntarily agreed to participate and were included in our study. As of 2022, there were 29,340 non-professional employed (E-9 visa) Vietnamese workers in the Republic of Korea. Our study involved a survey of 87 individuals, which represents 0.3% of the total Vietnamese worker population in that year [14].

### 2.2. Measuring instruments and comparison databases

This study identified the distribution of demographic information, occupational characteristics, and factors related to changes in the workplace of Vietnamese migrant workers in the Republic of Korea and identified the risk of health status and workplace hazards compared to the reference population.

The reference population data were sourced from two principal databases in the Republic of Korea, namely, the 2017 Korean Working Conditions Survey (KWCS) and the 2020 Korea National Health and Nutrition Examination Survey (KNHANES). We chose these datasets as they are the most recent available that encompass the specific questions and variables of interest for our study.

The KWCS is a representative survey conducted among approximately 50,000 individuals selected from a population of about 26 million economically active Koreans. From this data, we focused on a subset that closely resembles our study participants, the Vietnamese male migrant workers, who work in the manufacturing industry, construction industry, agriculture industry, and fishing industry as blue-collar workers. We confined our reference population from KWCS to the data of individuals aged 20–49, wage workers, blue-collar workers, and those working in manufacturing, construction, agriculture, and fishing industries. Taking the weights into account, this KWCS reference population represented a group of 1,290,341 Koreans (Supplementary Table 1). Additionally, as most Vietnamese migrant workers are employed in small-scale businesses, we also conducted a sensitivity analysis on the subset (750,902 Koreans) of the KWCS reference population that is under 50 years of age.

For the main variables, the same questionnaire items as the KWCS data were used. For “health problems and work-related health problems” such as hearing problems, skin problems, back pain, upper extremity pain, lower extremity pain, headache and general fatigue, two questionnaires from the 2017 KWCS were used: “Over the last 12 months, did you have any of the following health problems” and “If you have health problems, are your health problems due to your job” [15]. For other variables of workplace hazards, the 2017 KWCS was used as reference data. For environmental risk factor variables (vibration, noise, and high and low temperature), chemical risk factor variables (dust, organic solvents, and chemicals), and ergonomic risk factor variables (painful posture and handling heavy objects), the question “Please tell me, using the following scale, are you exposed at work to ...” was used. In response to the workplace hazard question, “All of the time”, “Almost all of the time”, “Around  $\frac{3}{4}$  of the time”, or “Around half of the time” was considered a hazard, and “Around  $\frac{1}{4}$  of the time”, “Almost never”, or “Never” was considered no hazard. A dangerous workplace was measured by the question “Do you think your health or safety is at risk because of your work” The participants could answer “Yes” or “No”. To the question “Over the past 12 months did you work when you were sick”, answering “Yes” was classified as having presenteeism and answering “No” was classified as not having presenteeism. No personal protective equipment was defined through two questions: “Does your job ever require that you wear personal protective equipment (helmet, gloves, mask, protective goggles, etc.)” and “Do you always use it when it is required”. Through the questionnaires, participants were classified into three categories: “I do not need to wear personal protective equipment”, “I need to wear personal protective equipment, but I work without wearing it”, and “I need to wear personal protective equipment, and I work wearing it”.

For variables related to unmet medical needs, for which the KWCS does not have data, we also used the KNHANES as the reference population. The KNHANES is a survey conducted among about 10,000 individuals selected as the representative samples from a population of 50 million Koreans aged one year or older. However, unlike the KWCS, the 2020 KNHANES does not have a survey on worker’s industry and workplace size. Therefore, we limited our reference population from KNHANES to the data of blue-collar wage workers aged 20–49. Considering the weights, this reference population represents a group of 2,025,214 Koreans (Supplementary Table 2). For unmet medical needs among the

variables of workplace hazards, the 2020 KNHANES was used as reference data [16]. Unmet medical needs were evaluated through the question “Over the last 12 months, have you required hospital treatment but have not received it”, and the participants could answer “Yes,” “No”, or “I have not needed a hospital examination”.

We constructed our questionnaire using the same questions as those in the KWCS and KHANES surveys and additionally included questions to capture demographic information, occupational characteristics, and factors associated with changes in the workplace. The questionnaire was translated into Vietnamese by an expert translator whose notarial certificate was obtained.

### 2.3. Statistical analyses

Indirect standardization was performed to assess whether the outcome prevalence in Vietnamese migrant workers differed from that in the reference population when Vietnamese migrant workers' age was considered. The aSPR, which is the ratio of the observed number of cases of Vietnamese migrant workers to the expected number of cases obtained through the prevalence rate by age group of the reference population, was calculated. Additionally, 95 percent confidence intervals (95% CI) were calculated using Byar's approximation [17,18]. To ensure accurate prevalence calculations, prevalence was calculated after excluding respondents who answered “I haven't needed a hospital examination” in the case of unmet medical need. Similarly, in the case of no personal protective equipment, prevalence was calculated after excluding respondents who responded “I do not need to wear personal protective equipment”.

For the survey data from Vietnamese migrant workers, we utilized the 'proc freq' function in SAS to derive the total count for each age group and the number of the each outcome for each age group. To compute the age group-specific prevalence from the reference population data, the 'proc surveyfreq' function along with weights was employed in SAS, thereby providing an age-group weighted prevalence representative of the Korean population. Based on the values calculated in SAS, we computed the aSPR of each outcome using Microsoft Excel.

### 2.5. Ethics statement

This original study was approved with an exemption of ethical deliberation by the Institutional Review Board of St. Mary's Hospital, Catholic University of Korea (exemption number: KC22QISI0692).

## 3. Results

The general characteristics of Vietnamese male migrant workers are shown in Table 1. Their ages ranged from 20 to 49 years, with the majority in their 20s and 30s. Most participants (83.90%) belonged to workplaces with fewer than 50 employees, showing the characteristics of small-scale enterprises. When classifying participants by industry, 57.47% were in the manufacturing industry, 19.54% in the construction industry, and 22.99% in the agricultural and fishing industries.

Table 2 presents the factors related to workplace changes. Most participants considered changing their workplace (80.46%). Most participants (72.41%) were aware of the system for changing workplaces due to health problems, but some (27.59%) remained unaware. Among the 70 participants considering workplace changes, the main reasons for such changes included health problems (48.57%), low income (14.29%), hazardous workplace environments (12.86%), relationships with coworkers and supervisors (7.14%), unsanitary workplaces (2.86%), and other reasons

**Table 1**  
Baseline characteristics of study participants (n = 87)

	N (%)
Age group	
20–29	36 (41.38%)
30–39	48 (55.17%)
40–49	3 (3.45%)
Workplace size (Number of employee)	
<10	40 (45.98%)
10–49	33 (37.93%)
≥50	14 (16.09%)
Industrial classification	
Agricultural industry	5 (5.75%)
Construction industry	17 (19.54%)
Fishing industry	15 (17.24%)
Manufacturing industry	50 (57.47%)
Smoking status	
Former smoker	22 (25.29%)
Never smoker	41 (47.13%)
Current smoker	24 (27.59%)

(14.29%). Table 2 shows the distribution of each health problem related to workplace change among those considering changing their workplace. Most participants responded that they had lower back pain (88.57%), upper extremity pain (84.29%), lower extremity pain (74.29%), and general fatigue (82.86%).

The aSPRs of health and work-related health problems between Vietnamese male migrant workers and the reference population in the Republic of Korea are detailed in Table 3 and Supplementary Table 3. These tables indicate a higher prevalence of various health issues among Vietnamese workers. Table 3 shows a considerably higher aSPR for hearing problems [12.33 (95% CI: 7.04–20.01) for health problems and 13.22 (95% CI: 8.07–20.4) for work-related health problems] and skin problems [12.29 (95% CI: 7.02–19.94) for health problems and 13.49 (95% CI: 8.24–20.82) for work-related health problems] among Vietnamese male migrant workers than for the Korean reference population. The aSPR is also notably high for other health issues such as low back pain, upper extremity pain, lower extremity pain, headache, and general fatigue among the Vietnamese workers. On the other hand, Supplementary Table 3 displays the aSPRs in workplaces with fewer than 50 employees in the Republic of Korea. While the aSPR for hearing and skin problems could not be calculated due to a small number of cases, significant ratios were observed for low back pain,

**Table 2**  
The factors related to workplace change (n = 87)

	N (%)
Number of workers considering the change of workplace	70 (80.46%)
Number of workers being aware of the scheme for changing the workplace due to health problem	63 (72.41%)
Main reason for change of workplace (n = 70)	
-Health problem	34 (48.57%)
-Low income	10 (14.29%)
-Hazardous workplace environment	9 (12.86%)
-Coworker and supervisor relationship	5 (7.14%)
-Unsanitary workplace	2 (2.86%)
-The others	10 (14.29%)
Health problems related to the change of workplace (n = 70)	
- Hearing problem	29 (41.43)
- Skin problem	25 (35.71)
- Low back pain	62 (88.57)
- Upper extremity pain	59 (84.29)
- Lower extremity pain	52 (74.29)
- Headache	42 (60)
- General fatigue	58 (82.86)

**Table 3**

Age-standardized prevalence ratio of health problems and work-related health problems between Vietnamese male migrant workers and the reference population in the Republic of Korea

	aSPR (95% CI) for health problem*	aSPR (95% CI) for work-related health problem <sup>†</sup>
Hearing problem	12.33 (0.04–20.01)	13.22 (8.07–20.4)
Skin problem	12.29 (7.02–19.94)	13.49 (8.24–20.82)
Low back pain	8.87 (6.77–11.42)	8.4 (6.5–10.69)
Upper extremity pain	3.1 (2.32–4.07)	3.29 (2.51–4.24)
Lower extremity pain	4.78 (3.49–6.4)	5 (3.72–6.58)
Headache	6.29 (4.45–8.64)	6.61 (4.82–8.84)
General fatigue	2.96 (2.16–3.97)	3.24 (2.42–4.25)

aSPR, age-standardized prevalence ratio; CI, confidence interval.

If the confidence interval of the aSPR (age-standardized prevalence ratio) does not include 1, this indicates a statistically significant difference in the prevalence of each variable between Vietnamese male workers and the Korean reference population.

\* This variable represents the responses to the question asking whether respondents experienced any of the listed health problems during the past 12 months.

<sup>†</sup> This variable represents the combined responses to the question regarding the presence of any health problems experienced over the last 12 months, along with the indication of whether respondents attribute their health problems to their job.

upper extremity pain, lower extremity pain, headache, and general fatigue among Vietnamese migrant workers, indicating a higher prevalence of these issues than the reference population.

Table 4 and Supplementary Table 4 provide the main analysis and sensitivity analysis, respectively, of the aSPRs for various workplace hazards experienced by Vietnamese male migrant workers in the Republic of Korea, with the latter focusing on workplaces with fewer than 50 employees. Both tables collectively indicate a higher prevalence of certain workplace hazards for these workers than the reference population in the Republic of Korea. The highest aSPR is seen for unmet medical needs, followed by presenteeism, and the conditions of working in a dangerous workplace. Environmental risk factors like high and low temperatures and noise exposure, as well as chemical risk factors such as dust, organic solvents, and chemicals, also consistently show elevated aSPRs. These risks appear to be more pronounced for workers in smaller workplaces (fewer than 50 employees).

**Table 4**

Age-standardized prevalence ratio of workplace hazards between Vietnamese male migrant workers and the reference population in the Republic of Korea

	SPR (95% CI)
Dangerous workplace	2.7 (2.07–3.46)
Environmental risk factor	
Vibration	1.03 (0.76–1.36)
Noise	1.63 (1.22–2.12)
High temperature	1.96 (1.46–2.57)
Low temperature	1.98 (1.38–2.76)
Chemical risk factor	
Dust	1.93 (1.42–2.55)
Organic solvents	2.22 (1.44–3.28)
Chemicals	2.36 (1.51–3.51)
Ergonomic risk factor	
Painful posture	1.32 (1.01–1.71)
Handling heavy objects	1.67 (1.24–2.21)
Unmet medical needs	7.14 (4.74–10.32)
No personal protective equipment	2.53 (1.26–4.52)
Presenteeism	4.44 (3.25–5.92)

aSPR, age-standardized prevalence ratio; CI, confidence interval.

If the confidence interval of the aSPR (age-standardized prevalence ratio) does not include 1, this indicates a statistically significant difference in the prevalence of each variable between Vietnamese male workers and the Korean reference population.

## 4. Discussion

To summarize, our study's majority of participants were male Vietnamese workers in the Republic of Korea, employed predominantly in small-scale manufacturing workplaces, similar to prior reports [11,19–22]. These workers showed a higher prevalence of health issues and workplace hazards than the general Korean population.

Previous studies have consistently reported poor workplace conditions and health concerns among migrant workers in the Republic of Korea. For instance, a study involving migrant workers visiting nine centers in Gyeonggi-do, Republic of Korea [23] revealed that 35.1% of all participants and 37.3% of Vietnamese workers reported musculoskeletal symptoms. The prevalence of these symptoms varied by occupation: 44.0% in construction, 42.5% in service, and 34.7% in manufacturing. The main reasons for outpatient or inpatient treatment exceeding three days were musculoskeletal issues (41.5%), respiratory illness (25.7%), dermatological concerns (16.0%), and noise-induced hearing loss (7.2%) [24]. Harmful factors identified in the working environment included fumes and dust, noise, high temperatures, and heavy weight handling [11].

To explain why Vietnamese workers in the Republic of Korea face poor working conditions and health issues, we must consider the employment conditions for foreign workers in the country. Fundamentally, hiring foreign workers in the Republic of Korea is only possible when Korean nationals cannot fill the positions, implying that the workplaces employing foreigners are often hazardous and unfavorable, rejected by Korean workers. Consequently, these risky environments significantly exacerbate the health of foreign workers, a situation further worsened by their inability to seek medical help when ill. Additionally, the restrictive workplace change policy for migrant workers in the Republic of Korea, prioritizing management convenience over worker protection, potentially violates their human rights [25–27]. As a result, these workers are often trapped in adverse environments, further deteriorating their health.

While this study provides valuable insights, several limitations must be acknowledged. Firstly, our results might not be representative of all migrant workers, as the study focused on a sample of 87 Vietnamese workers. Our study may have potential limitations regarding the comparability of the reference population, despite utilizing the reference population with characteristics similar to our Vietnamese male worker participants. Especially when using the KNHANES as the reference population, the absence of information regarding the workers' industry and workplace size could further increase this risk of bias.

In conclusion, our study showed that Vietnamese male workers exhibited a higher exposure to workplace hazards and simultaneously faced a greater risk due to the lack of personal protective equipment than the Korean reference population. Despite the structure of employing foreign workers in hazardous work environments, which are typically avoided by Koreans, these workers' health risks could be escalated due to the insufficient supply of protective equipment. Therefore, a more proactive system is needed to manage the working conditions and the use of protective equipment in workplaces employing foreign workers. Additionally, they showed higher health problems along with a higher risk of unmet medical needs. Despite working in hazardous environments, these workers, unfamiliar with the healthcare system in a foreign country, face difficulty in accessing medical services. As such, it is essential to establish a system that guides them to easily access hospitals. Furthermore, 27.59% of Vietnamese workers lacked the knowledge to change their workplaces due to health issues, continuing to work in hazardous conditions despite their suffering.

It is critical to include basic rights education in initial training to equip them with the knowledge to protect their health while working. Practical and legislative reviews are also needed to ensure that there are no difficulties in changing workplaces due to health issues.

### Conflicts of interest

The authors have no conflict of interest to declare.

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### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.shaw.2023.08.001>.

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