



# Prevalence and Determinants of Poor Sleep Quality among Myanmar Migrant Workers in Malaysia: A Cross-sectional Study

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## Authors' contributions

This work was carried out in collaboration between all authors. Authors LMA and JTA managed the literature searches, designed the study, performed the statistical analysis, wrote the protocol and wrote the manuscript. Authors AB, HY and OFO managed the data analysis and interpretation of results. All authors read and approved the final manuscript.

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## ABSTRACT

**Background:** Sleep quality is an important determinant of health; so much so that the socio-economic and healthcare burden of poor sleep quality is alarming. In Malaysia, there is a shortage of sleep-quality studies conducted on Myanmar migrant workers, who comprise a significant proportion of the Malaysian workforce.

**Aims:** To identify the prevalence and determinants of poor sleep quality among Myanmar migrant workers in Malaysia.

**Study Design:** A cross-sectional study utilising systematic random sampling with replacement method.

**Methodology:** The study was conducted on 216 Myanmar migrant workers. A questionnaire was used to detect the socio-demographic information, health status, socio-economic information and

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lifestyle factors, and the Pittsburgh Sleep Quality Index (PSQI) was used to measure sleep quality.

**Results:** The prevalence of poor sleep quality was found in 62.5% of the study population. The factors significantly associated with poor sleep quality were body mass index (BMI) (OR = 0.462, 95% CI 0.225-0.950, P = 0.036), skill level (OR = 0.283, 95% CI 0.097-0.822, P = 0.020), shift work (OR = 3.393, 95% CI 1.456-7.908, P = 0.005), days worked per week (OR = 2.317, 95% CI = 1.022-5.252, P = 0.044), working hours per day (OR = 2.305, 95% CI = 1.134-4.685, P = 0.021) and work-related physical tiredness (OR = 2.304, 95% CI = 1.186-4.476, P = 0.014).

**Conclusions:** The findings highlight the burden and determinants of poor sleep quality among Myanmar migrant workers in Malaysia. The prevalence of poor sleep quality was 62.5% of the study population. Six factors were associated with poor sleep quality in this population: having a lower BMI (Body mass index), being engaged in upper skill level jobs, being a shift worker, working 6 to 7 days a week and more than 8 hours per day and having to spend more than 30 minutes on a daily commute.

*Keywords: Poor sleep quality; prevalence; determinants; Pittsburgh Sleep Quality Index (PSQI); Myanmar migrant workers; Malaysia.*

## 1. INTRODUCTION

The socio-economic and healthcare burden of impaired sleep quality is enormous. The detrimental effects of poor sleep quality can be immediate, such as increases in accidents, industrial disasters and occupational injuries, or long-term, such as in adverse health consequences [1]. The Centers for Disease Control and Prevention (CDC) stated that insufficient sleep was increasingly accepted as a public health epidemic [1], yet it is still an unsolved public health problem [2].

According to the National Sleep Foundation and American Academy of Sleep, the prevalence of poor sleep quality among the general population was 30% [3]. However, sleep quality varies among international working populations, and actual studies performed on workers are limited in number. From available data, impaired sleep quality ranges from approximately 18% in Europe [4] to 23% in the United States [5] and 21% in Brazilian workers [6]. In Asia, the prevalence of impaired sleep quality in employed people is 44% in Hong Kong [7], 30-40% in Japanese white-collar workers [8] and 34% in the Philippines daytime hospital employees [9]. In Iranian professional fire fighters, the prevalence is as high as 69.9% [10].

In Malaysia, a large sample population-based study was not available for extrapolation, based on the whole working population. A prior sleep quality study had been conducted among Malaysian nurses to detect their sleep quality and associated factors [11]; however, no studies on workers from other industry sectors,

especially from the migrant working population in Malaysia, had been found till date.

The reason this study was conducted in the Malaysian Myanmar population was because Myanmar workers constitute the most significant proportion of the Malaysian workforce. Most of them work in the construction and manufacturing sectors, where accidents are usually fatal. Since there is a relationship between impaired sleep quality and accidents and injuries [12], it is imperative to investigate the prevalence and factors associated with poor sleep quality among this group of workers in Malaysia.

## 2. MATERIALS AND METHODS

### 2.1 Population and Sample

A cross-sectional study with a systematic random sampling method was conducted on Myanmar migrant workers who visited the Cahaya Suria building in Kuala Lumpur, a popular destination for Myanmar people to gather, during the study period. The sampling frame of 1400 was estimated using a prior survey. The current study's sample size was calculated as 216. The sampling interval was 7.

### 2.2 Study Tool

A questionnaire for face-to-face interviews was developed. It had 5 sections with questions to detect (a) the information for the socio-demographic variables, (b) the health status and anthropometric measures of the respondents (self-reported) to calculate body mass index (BMI), (c) the socio-economic information,

(d) lifestyle information and (e) information to measure sleep quality via the Pittsburgh Sleep Quality Index (PSQI). A study information sheet and consent form was also prepared. The PSQI is a self-administered questionnaire that measures subjective sleep quality and disturbance in adults over a prior one month period [13]. It was useful for distinguishing between good and poor sleepers [13], with a Cronbach's alpha value of 0.83 for all components [14]. The questionnaire had a diagnostic sensitivity of 89.6% and specificity of 86.5% [13]. The items on the PSQI were rated on a Likert scale ranging from '0–3'. The sum of the scores ranged from 0–21. A global PSQI score of 5 and above implies poor sleep quality.

All the study tools were translated into Myanmar, back-translated into English and re-translated into Myanmar by three independent language experts. The uniformity of the language was checked by the researcher afterwards.

### 2.3 Outcome Definition

In this study, sleep quality was defined as one's satisfaction of the sleep experience, integrating aspects of sleep initiation, sleep maintenance, sleep quantity and refreshment upon awakening [15].

### 2.4 Sampling Procedure

A systematic random sampling method was performed by the interviewer to identify the first participant as a starting point. A number was picked from 1 to 7 using a lottery method. For instance, if the lottery number was 4, the 4<sup>th</sup> person who entered the Cahaya Suria building was selected as a starting point, and every 7<sup>th</sup> person who walked through the entrance was picked up thereafter. A new candidate was approached using the above-mentioned method if there was a refusal to participate or the inclusion criteria were not met. The whole procedure was repeated until the required sample size was obtained. Respondents were selected based on the selection criteria of being aged 20 to 65, being Myanmar citizenship holders at the time of study.

The questionnaire was pretested on 25 Myanmar workers from the study population. The participants were picked up using systematic random sampling with a replacement method. Those who met the inclusion criteria were

recruited to the study. The study information sheets were given. Face-to-face interviews were performed after informed written consent was obtained from the respondents.

### 2.5 Data Analysis

The data collected were tabulated and analysed using the statistical software Statistical Package for the Social Sciences (SPSS) version 17.0. The results of the categorical variables were expressed in terms of proportions. For further analysis, some continuous variables were converted into dichotomous categorical variables by applying suitable standard cut-offs.

Chi-square test was applied for the comparison of categorical variables. Odds Ratio (OR) and its 95% confidence interval (CI) were used to study the strength of associations between variables. Logistic Regression Analysis was used to study the independent effect of variables over the outcome.  $P = 0.05$  was used for determining significance.

## 3. RESULTS AND DISCUSSION

After approaching every 7<sup>th</sup> new candidate who entered the building, a total of 327 Myanmar workers were requested to participate in the study to reach the target sample size of 216. Among the 327 workers, 7 respondents did not meet the inclusion criteria, and 104 workers refused to participate in the study, due to either being uncomfortable with interviews or having time constraints.

Based on the data collected, baseline characteristics were obtained about the Myanmar migrant workers, including their socio-demographic factors, socio-economic factors, medical conditions, lifestyle factors and sleep information. The PSQI sleep quality scores were calculated and subsequently used to categorise the workers into two groups: 'poor sleep quality group' and 'normal sleep quality group'. For the analysis, the variables that were categorised into more than two categories in the questionnaire were regrouped into dichotomous categories.

Table 1 shows the socio-demographic information of the respondents. It can be seen that majority of the respondents were Myanmar males with no children and no tertiary education, who were staying away from family and not sleeping alone.

Looking at the socio-economic aspect Table 2, the majority of workers were lower skill level non-shift workers who earned less than RM2500 per month, with total working days of more than 5 days a week and working hours of up to 8 hours a day. Most of them did not undertake a part-time job in addition to their main occupation.

From Table 3, it can be seen that a bigger portion of the workers in the study population did not have any known medical conditions, and belonged to the normal or underweight category. The majority also denied any consumption of alcohol.

**Table 1. Socio-demographic characteristics of the respondents**

Variables	Variables categories	Frequency (N=216)	Percentage (%)
Age	<30 years	98	45.4
	30 years and above	118	54.6
Gender	Male	192	88.9
	Female	24	11.1
Race	Myanmar	147	68.1
	Non-Myanmar	69	31.9
Marital status	Single	110	50.9
	Married	106	49.1
Children	Have children	83	38.4
	Do not have children	133	61.6
Education	No tertiary education	174	80.6
	Tertiary education	42	19.4
Staying with family	Yes	59	27.3
	No	157	72.7
Number of people in house	6 and above people	102	47.2
	1-5 people	114	52.8
Number of people sharing bedroom	Sharing bedroom with more than 1 people	134	62
	Sleep alone in bedroom	82	38

**Table 2. Socio-economic conditions of the respondents**

Variables	Variables categories	Frequency (N=216)	Percentage (%)
Monthly income	From RM 500-2499	192	88.9
	RM 2500 and above	24	11.1
Years working in Malaysia	6 years and above	105	48.6
	Below 6 years	111	51.4
Skill level of jobs	Lower skill level 1 and 2	185	85.6
	Upper skill level 3 and 4	31	14.4
Working shift	Yes	46	21.3
	No	170	78.7
Working hours per day	More than 8 hours per day	69	31.9
	Up to 8 hours per day	147	68.1
Days worked per week	6-7 days	175	81
	1-5 days	41	19
Daily travel time	Above 30 minutes	57	26.4
	Up to 30 minutes	159	73.6
Part-time job on top of main occupation	Yes	22	10.2
	No	194	89.8

**Table 3. Health status and lifestyle factors of the respondents**

Variables	Variables categories	Frequency (N=216)	Percentage (%)
Medical conditions	Presence of medical conditions	63	29.2
	No known medical conditions	153	70.8
Body Mass Index	Overweight and obese	55	25.5
	Normal weight and underweight	161	74.5
Work-related physical tiredness	Yes	93	43.1
	No	123	56.9
Work-related mental stress	Yes	96	44.4
	No	120	55.6
Smoker	Yes	82	38
	No	134	62
Alcohol consumption	Yes	56	25.9
	No	160	74.1
Consumption of caffeinated beverages	Yes	76	35.2
	No	140	64.8

Based on the criteria, the respondents were categorised into two groups, 'poor sleepers' and 'good sleepers'. Of the 216 respondents, 135 (62.5%) workers scored a PSQI score of equal to or greater than 5. They were categorised into the group having 'poor sleep quality'. The rest of the 81 (37.5%) respondents were categorised as having 'normal sleep quality'.

In the multivariate analysis, after controlling the confounders, the factors that were strongly and independently associated with poor sleep quality in this study were identified as shown in Table 4. Having a lower BMI was found to be significantly associated with poor sleep. Similarly, higher-level skill workers were more likely to have poor sleep. Working shifts, working more than 5 days per week and prolonged working hours (more than 8 hours per day) were other factors associated with poor sleep quality. Lastly, engagement in physically challenging work was also significantly associated with poor sleep quality.

The prevalence of poor sleep quality among Myanmar migrant workers in this study was found to be 62.5%. This was higher compared to studies done among nurses in Melaka, Malaysia (57.8%) [11], white-collar employees in Japan (30-40%) [8], workers in the United States (29.9%) [5] and hospital employees in the

Philippines (34%) [9]. However, the finding was slightly lower than that of Iranian professional fire fighters, where the prevalence was 69.9% [10]. The high prevalence in this study may be attributed to work-related stress, low socio-economic status, lifestyle and extra stress being a migrant, as they might feel homesick, stressed from the struggles of life and worried about their jobs, unlike those workers who worked in their homelands [16,17,18].

Workers with lower skill levels were less likely to have poor sleep compared to workers with upper skill levels (OR = 0.283, 95% CI 0.097-0.822, P = 0.02). This was in contrast with some of the studies done in Japan [19] and France [20] where Sekine et al. [19] found lower skill level Japanese workers were 1.64 times more likely to have poor sleep (95% CI 1.14-2.36), and Léger et al. [20] found that disturbed sleep was more likely to exist in blue-collar workers in France (OR = 3.0, 95% CI 0.68-13.31). Even though this result contradicted the results of other studies, the possible explanation for this result is that most of the lower skill migrant workers do not have much time or money to participate in after-work social activities. Most of them would simply leave work and spend the rest of the evening in their bedrooms, which may give them greater opportunity for longer sleep hours.

**Table 4. Multivariate analysis; correlates of poor sleep quality**

Variables	Category	OR	95% CI	P value
Skill level of jobs	Lower skill level 1 and 2	0.283	0.097 - 0.822	0.020*
	Upper skill level 3 and 4			
Shifts	Yes	3.393	1.456 - 7.908	0.005*
	No			
Days worked per week	6–7 Days per week	2.317	1.022 - 5.252	0.044*
	1–5 days per week			
Working hours per day	More than 8 hours per day	2.305	1.134 - 4.685	0.021*
	Up to 8 hours per day			
Travel time daily	Above 30 minutes	1.988	0.940 - 4.204	0.072
	Up to 30 minutes			
Medical conditions	Presence of one or more medical conditions	1.3	0.643 - 2.627	0.465
	No known medical conditions			
BMI*	Overweight and obese	0.462	0.225-0.950	0.036*
	Normal weight and underweight			
Work-related mental stress	Yes	1.612	0.830 - 3.127	0.158
	No			
Work-related physical tiredness	Yes	2.304	1.186 - 4.476	0.014*
	No			
Smoking	Yes	1.287	0.671 - 2.467	0.447
	No			

\*P = 0.05 was considered as significant, \*adj – adjusted, \*BMI – Body Mass Index

The results also showed a significant association between shift work and poor sleep quality. Shift workers were 3.393 times more likely to have poor sleep compared to those who were not (95% CI 1.456-7.908, P = 0.005). This was supported by Åkerstedt et al. [21], who reported that shift work disturbed sleep in Swedish workers (OR = 1.56, 95% CI 1.36-1.79), and also by Yazdi et al. [22] who reported the same. However, shift work was not a determinant in the study done on Iranian fire fighters by Mehrdad et al. [10], who found no significant difference in sleep quality between shift and non-shift workers. However, shift work is a factor well known to interrupt the one's circadian rhythm and disturb sleep [23].

Another factor significantly associated with poor sleep quality in this study was the number of days worked per week. Those migrants who worked 6–7 days per week were 2.317 times more likely to have poor sleep compared to those who worked less than 6 days per week (95% CI = 1.022-5.252, P = 0.044). The reason may be that those who worked 6–7 days per week had to work more, which resulted in greater levels of tiredness and lesser chances to sleep on their

days off, to compensate for the sleep loss they experienced on working days.

The study also revealed that working more than 8 hours per day was significantly associated with poor sleep quality (OR = 2.305, 95% CI = 1.134-4.685, P = 0.021). This was supported and explained by a cohort study done by Virtanen et al. [24], who reported that working long hours was a risk factor for the development of shortened sleep hours and difficulty falling asleep. A similar finding was observed in a study done on Japanese civil servants by Sekine et al. [19], where they found that longer working hours was independently associated with poorer sleep quality in both men and women.

In this study, workers who belonged to the overweight and obese BMI category had better sleep quality (OR = 0.462, 95% CI 0.225-0.950, P = 0.036). This significant result contradicted the findings of most of the studies, which established a significant association between increasing BMI and poor sleep quality [25,26]. However, one study agreed with the current study result [25]. That author stated that there was no explanation for this finding in his study, a

study which needs to be replicated. A similar finding of the association between lower BMI and poor sleep quality was also observed in a study done by Dayo et al. [9].

Workers who reported that their work was physically tiring were 2.304 times more likely to have poor sleep quality (95% CI = 1.186-4.476, P = 0.014). Many studies have agreed with this result, concluding that physical workload interfered with sleep [27,28,29], as found in the Swedish study conducted by Åkerstedt et al. and also in the study done on Japanese employees by Sekine et al. [19]. The fact that physically tired workers have complaints of body aches and pain might be the possible reason for the poor sleep quality in this study population.

As this study was conducted in only one district of Pudu in Malaysia, the findings from this study cannot be extrapolated to all the Myanmar migrant workers in Malaysia. Also, using the Cahaya Suria building can introduce bias, as Myanmar workers who visited that place during study time might not be representative of people with sleep problems.

#### 4. CONCLUSION

A high prevalence of poor sleep quality (62.5%) was found in Myanmar migrant workers in this study. There were 6 factors associated with poor sleep quality in this population: having a lower BMI, being engaged in upper skill level jobs, being a shift worker, being a migrant worker working 6 to 7 days a week and more than 8 hours per day and having to spend more than 30 minutes on the daily commute. The findings highlight the burden of poor sleep quality among Myanmar migrant workers. This prompts the need for further studies to measure the outcomes of poor sleep quality in workers, such as performance, absenteeism, fatigue, occupational accidents and fatal injuries, cognitive function and overall impact on employees.

#### CONSENT

All authors declare that informed written consent was obtained from the respondents.

#### ETHICAL APPROVAL

Approval for the present study was obtained from the Joint Committee of research and ethics of the International Medical University (IMU).

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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