International Journal of Community Medicine and Public Health
Mauk KKA et al. Int J Community Med Public Health. 2026 Jul;13(7):3393-3399
https://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20262229

Original Research Article

Clinical and psychological predictors of poor sleep quality among non-medical university staff in Myanmar: a cross-sectional study

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Received: 25 April 2026
Revised: 08 June 2026
Accepted: 10 June 2026

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ABSTRACT

Background: Sleep quality influences productivity and overall well-being. Evidence on the clinical and psychological predictors of sleep quality among non-medical staff in medical and allied universities in Myanmar remains limited. This study aimed to determine the prevalence of poor sleep quality and identify its independent predictors among non-medical university staff.

Methods: A cross-sectional study was conducted among 430 non-medical staff from seven medical and allied universities in Myanmar between January and August 2025. Data were collected using guided self-administered questionnaires covering socio-demographic characteristics, diabetes mellitus status, sleep quality, and mental health. Sleep quality and mental health were assessed using the Pittsburgh Sleep Quality Index (PSQI) and depression, anxiety, and stress scale (DASS-21), respectively. Blood pressure was measured using WHO-validated digital sphygmomanometers. Multivariable binary logistic regression was used to identify independent predictors of poor sleep quality.

Results: The prevalence of poor sleep quality was 39.3%. Participants had a mean age of approximately 42 years; 83.3% were female and 57.2% were married. Diabetes mellitus and hypertension were present in 5.4% and 28.9% of participants, respectively. Anxiety (aOR=2.88, p<0.001), depression (aOR=2.21, p=0.016), and diabetes mellitus (aOR=2.63, p=0.045) were significant independent predictors of poor sleep quality, whereas stress was not.

Conclusions: Poor sleep quality is highly prevalent among non-medical university staff. Anxiety, depression, and diabetes mellitus were significant predictors. University wellness programs should prioritize mental health screening, diabetes management, and routine sleep quality assessment.

Keywords: Anxiety, Depression, Diabetes mellitus, Myanmar, Sleep quality, University staff

INTRODUCTION

Nowadays, sleep quality is increasingly documented in public health as a complex, multidimensional construct, far beyond the mere duration of rest.[1] It covers several critical domains, including subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, etc.[1] For the working population, keeping high-quality sleep is a principal driver of cognitive readiness, which is crucial for maintaining important brain functions such as decision-making, emotional regulation, and sustained attention. As a result, poor sleep quality directly compromises workplace safety and operational productivity due to poor cognitive functions. Finally, chronic poor sleep leads to reduced professional productivity and impaired long-term physical and metabolic health and thus sleep quality is a vital component of holistic occupational well-being.[2]

In previous studies, scientists discovered that there are a number of known factors associated with sleep quality for

general population. Generally, poor sleep is often believed to be associated with modifiable lifestyle factors, such as excessive caffeine consumption, irregular sleep schedules, and prolonged exposure to blue light from digital gadgets before bedtime.[3] Exploring the factors influencing sleep quality for specifically for working population is required for planning effective health interventions for this population group.

For working population, mental and clinical factors are frequently noted as more powerful independent predictors of sleep quality. Concerning mental health, high levels of mental distress- specifically symptomatic anxiety and depression- have been shown to impair sleep quality by increasing sleep onset latency and reducing restorative slow-wave sleep.[4] In addition, the sleep cycle is often weakened by nocturnal hyperglycaemia and physical discomfort in chronic metabolic conditions, specifically diabetes mellitus.[5,6] In shaping overall sleep quality for working population, these clinical and mental health drivers often overshadow traditional modifiable lifestyle habits.[4-6]

Until now, there are a number of standardized self-report instruments utilized to identify sleep quality status, for different purposes in different populations, namely the insomnia severity index (ISI), sleep quality scale (SQS), Epworth sleepiness scale (ESS), Pittsburgh sleep quality index (PSQI) and etc. One of the common standards for assessing sleep quality in public health is the Pittsburgh sleep quality index (PSQI). The PSQI is an internationally validated tool designed to, measure sleep quality and sleep pattern in adults over a one-month period.[1] In clinical and research practice, those with a global PSQI score of greater than 5 is designated as “poor sleepers” and those below and equal to a global PSQI score 5 as good ones. This PSQI is said to be highly reliable for identifying sleep quality in diverse populations.[1]

When it comes to sleep quality, there are evidences showing prevalence of poor sleep quality in general population, health care professionals (nurses), patients in Myanmar and Myanmar migrant workers in Malaysia. For general population, prevalence of poor sleep quality is found to be 29%, a figure that serves as a critical baseline for community health assessments while 48.4% of Diabetes Mellitus patients experienced poor sleep quality.[5] However, this burden of poor sleep quality is significantly higher among specific high-risk occupational groups within the country. For instance, research conducted among nurses in Yangon’s 200-bedded hospitals revealed a stunning 63% prevalence of poor sleep quality.[7] Furthermore, research in south India found that 53.6% of medical staff and 66% of nursing staff suffered from poor sleep quality, reinforcing the notion that institutional environments impose a substantial sleep-related stressor on their workforce.[8] Another Myanmar occupational group in Malaysia showed a high prevalence 62.5% of poor sleep quality in Myanmar migrant workers.[9] These noteworthy contrasts between the general public and specialized workgroups stresses the urgent need to evaluate the sleep health of other essential but under-researched sectors of the Myanmar national workforce.

In Myanmar, different kinds of human resources for health have been mainly produced by 15 medical and allied universities, and three training schools under leadership and governance of Ministry of Health (Myanmar).[10] Education of the health workforce are being delivered by medical professionals and non-medical staff members. Non-medical staff members include both teaching staff and non-teaching one such as registrars, accountants, etc. While these institutions are primarily staffed by medical professionals whose sleep patterns are frequently investigated, they also rely on a substantial workforce of non-medical administrative and support personnel. While the medical staff may face acute sleep deprivation from hospital duties, the “non-medical” workforce is subject to chronic institutional stressors that may equally compromise their sleep health. Therefore, it is important to give attention to sleep quality of non-medical staff as they are the major contributor to health workforce production for Myanmar.

Sleep disruption has the complex etiology. Sleep quality is impaired in chronic metabolic conditions, specifically Diabetes Mellitus, by causing nocturnal hyperglycemia and peripheral discomfort.[5,6] Moreover, psychological distress, especially symptomatic anxiety and depression, increases autonomic hyperarousal and makes sleep onset difficult.[4,11] Therefore, when it comes to sleep quality, not only traditional lifestyle behaviours but also chronic metabolic conditions and mental distress need to be considered for targeted clinical interventions.

While the sleep quality of frontline healthcare providers is well-evidenced, no known prior research has identified the independent predictors of poor sleep quality among the non-medical staff who are essential to institutional operations in medical and allied universities. This knowledge gap prevents the development of evidence-based institutional wellness programs that could mitigate the risks of chronic disease and mental health problems within this population.[11] Therefore, primary objective of this study was to determine the prevalence of poor sleep quality among non-medical staff across seven medical and allied universities in Myanmar using the PSQI. Furthermore, this research aimed to identify the specific clinical and psychological independent predictors for sleep quality specifically diabetes mellitus and symptomatic mental distress through multivariable analysis.[12,13]

By addressing this knowledge gap, the findings from this study help translating data to targeted occupational health policies to support the holistic well-being of the non-medical workforce in medical and allied universities in Myanmar.

METHODS

Study design and setting

A cross-sectional study was conducted across seven medical and allied universities in Myanmar from January to August 2025. This timeframe allowed for a representative assessment of staff across various phases of the academic calendar.

Sample size determination and sampling

A single proportion formula for a cross-sectional study was used to determine minimum required sample size as follows.[14]

$$n = \frac{Z^2\, P(1-P)}{d^2}$$

n: Minimum required sample size.[14]

Z (confidence level): 1.96 (for a 95% confidence interval)

D (precision): 0.05 (5% margin of error)

P (expected prevalence): the prevalence of poor sleep quality in each specific participant group.

Comparison group: general population.[6]

Prevalence (P): 29% (0.290)

Calculation (n)

n = $[(1.96)^2*0.29(1-0.29)]/(0.05)^2$

n +10% dropout= 350

Comprehensive lists of non-medical staff members (sampling frame) were obtained from the respective universities. As a sampling procedure, a total population sampling approach was employed, this means that all non-medical study participants who met the inclusion criteria and who did not meet the exclusion criteria were invited to participate in this study.[15]

Study participants

Inclusion criteria in this study were non-medical and administrative staff (including teaching staff for non-medical subjects) aged 18 years or older and exclusion criteria were ground staff (e.g., gardening, security), pregnant individuals, those with cognitive or communication impairments, staff on extended leave, and individuals currently taking antihypertensive medications. A total of 430 non-medical staff members were recruited based on the inclusion and exclusion criteria.

Data collection methods and tools

Data were collected through guided self-administered questionnaires and standardized physical measurements.

Information on age, gender, marital status, Diabetes Mellitus status, sleep quality and mental health status was collected via guided self-administered questionnaire. Blood pressure was measured using WHO-validated digital sphygmomanometers.[16] After a 5-minute rest, three readings were taken three minutes apart; the average of the final two readings was used to determine hypertension status. Blood pressure was measured following guideline “how to measure blood pressure” from non-communicable disease division, Ministry of Health (Myanmar).[17] In this study, hypertension status was operationally defined as a three-category categorical variable based on the average of the final two blood pressure readings: low/normal: systolic blood pressure (SBP) <120 mmHg and diastolic blood pressure (DBP) <80 mmHg, elevated: SBP between 120-129 mmHg and DBP<80 mmHg, hypertensive: SBP≥130 mmHg or DBP≥80 mmHg.

The Pittsburgh sleep quality index (PSQI) was used to assess sleep patterns over the previous month. This PSQI tool consist of seven distinct components: subjective sleep quality, sleep latency; sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction.[1] It has 19 self-rated questions and these self-rated 19 items combine to form seven component scores. Each component is scored from 0 to 3. Finally, all seven component scores were added together to result a final global score ranges from 0 to 21 depending on the sleep quality experienced in last month. A global PSQI score > 5 was used to define "poor sleep".[1] The PSQI is a globally recognized and internationally validated instrument and it has demonstrated high internal consistency and reliability. Its Cronbach’s alpha has typically ranged from 0.70 to 0.83 across various populations.[1,18]

The depression, anxiety, and stress scale (DASS-21) is a widely used self-report questionnaire designed to assess the severity of symptoms related to depression, anxiety, and stress over the preceding week.[19] The DASS-21 consists of 21 items; 7 items each for anxiety, depression and stress. Participants responded how likely each item described what they experienced last week according to four-point Likert scale. Scores for depression, anxiety and stress were summed and multiplied by two for each subscale. Final scores for each subscale ranged from 0 to 42.[19] According to the DASS-21 manual by Lovibond and Lovibond, participants were categorized as “symptomatic” if their scores exceeded the “normal” threshold in any subscale: depression >9, anxiety >7, and stress >14. These cut-off points were utilized to categorize the study participants into "normal” and “symptomatic” categories for statistical analysis. The DASS-21 is an internationally validated tool and it has been noted for its high reliability and strong psychometric properties. Its Cronbach’s alpha values has usually been above 0.80 for all three subscales in diverse clinical and non-clinical settings.[19,20]

Statistical analysis

Data analysis was performed using Stata/MP 15.1. Socio-demographic and clinical characteristics were summarized as frequencies and percentages for purpose of descriptive statistics. For bivariate associations, Chi-square tests were used to find whether there was an association between these factors and sleep quality. Multivariable binary logistic regression was employed to calculate adjusted odds ratios (aOR) and 95% confidence intervals (CI) to find independent predictors for poor sleep quality. The final model included diabetes, and mental health factors (anxiety, depression, stress) after adjusting for possible confounders such as age, gender, and marital status and hypertension. Model assumptions, including multicollinearity (via variance inflation factors) and goodness-of-fit (via the Hosmer-Lemeshow test), were verified.

RESULTS

Participant characteristics and sleep prevalence

A total of 430 non-medical staff members were included in this study, with a mean age of approximately 42 years. The predominant gender of study population was female (83.3%) and more than half of the study population was currently married group (57.2%). Regarding clinical health, 5.4% of participants reported to have diabetes mellitus, and 28.9% were categorized as hypertensive based on standardized blood pressure measurements. The overall prevalence of poor sleep quality among the study population was 39.3% (n=169), as defined by a global PSQI score greater than 5 (Figure 1).

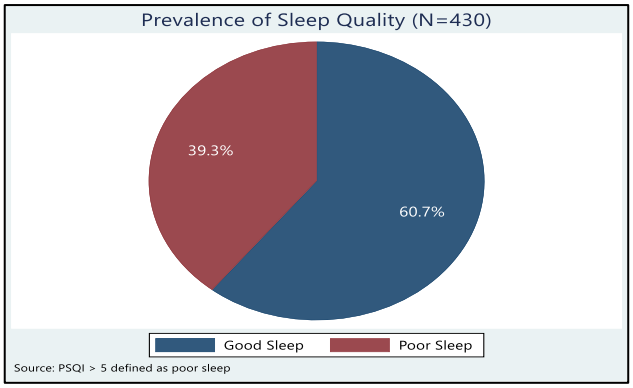

Figure 1: Prevalence of good and poor sleep quality among non-medical university staff based on global PSQI scores.

Note: Poor sleep quality is defined as a global Pittsburgh sleep quality index (PSQI) score >5.

Bivariate analysis of factors associated with sleep quality

In the bivariate analysis (Table 1), significant associations with poor sleep quality were found in several factors (DM and mental distress). Non-medical staff with DM had a significantly higher rate of poor sleep compared to those without DM (60.9% versus 38.1%, p=0.030). All three mental domains measured by the DASS-21 showed strong associations with sleep quality (p<0.001 for anxiety and depression, p=0.001 for stress). However, age (p=0.847), gender (p=0.937), marital status (p=0.462), and hypertension status (p=0.239) did not demonstrate statistically significant associations with sleep quality in this study.

Table 1: Baseline characteristics and mental health status of non-medical university staff (n=430).

Variables	Categories	Total (N=430) (%)	Good Sleep (n=261) (%)	Poor Sleep (n=169) (%)	P value
Socio-demographic Factors					
Age (years)	< 30	47 (10.9)	30 (63.8)	17 (36.2)	0.847
	30-45	200 (46.5)	119 (59.5)	81 (40.5)	
	>45	183 (42.6)	112 (61.2)	71 (38.8)	
Gender	Male	72 (16.7)	44 (61.1)	28 (38.9)	0.937
	Female	358 (83.3)	217 (60.6)	141 (39.4)	
Marital status	Currently partnered	246 (57.2)	153(62.2)	93(37.8)	0.462
	Not currently partnered	184 (42.8)	108 (58.7)	76 (41.3)	
Clinical factors					
Diabetes mellitus	No	407 (94.6)	252 (61.9)	155 (38.1)	0.030
	Yes	23 (5.4)	9 (39.1)	14 (60.9)	
Hypertension	Low/normal	287 (66.7)	167 (58.2)	120 (41.8)	0.239
	Elevated	19 (4.4)	14 (73.7)	5 (26.3)	
	Hypertensive	124 (28.9)	80 (64.5)	44 (35.5)	
Psychological factors (DASS-21)					
Depression	Normal	371 (86.3)	240 (64.7)	131 (35.3)	<0.001
	Symptomatic	59 (13.7)	21 (35.6)	38 (64.4)	
Anxiety	Normal	332 (77.2)	225 (67.8)	107 (32.2)	<0.001
	Symptomatic	98 (22.8)	36 (36.7)	62 (63.3)	
Stress	Normal	383 (89.1)	243 (63.4)	140 (36.6)	0.001
	Symptomatic	47 (10.9)	18 (38.3)	29 (61.7)	

Table 2: Multivariable binary logistic regression analysis of independent predictors for poor sleep quality (n=430).

Predictor variables	Category	Crude OR (95% CI)	Adjusted OR (95% CI)	P value
Diabetes mellitus	No	1.00 (Ref)	1.00 (Ref)	0.045
	Yes	2.52 (1.06-5.98)	2.63 (1.02-6.75)	
Anxiety	Normal	1.00 (Ref)	1.00 (Ref)	< 0.001
	Symptomatic	3.62 (2.26, 5.79)	2.88 (1.71, 4.88)	
Depression	Normal	1.00 (Ref)	1.00 (Ref)	0.016
	Symptomatic	3.31 (1.86, 5.88)	2.21(1.16, 4.21)	
Stress	Normal	1.00 (Ref)	1.00 (Ref)	0.499
	Symptomatic	2.79 (1.49, 5.21)	1.28(0.62, 2.66)	

Crude OR = crude odds ratio, aOR = adjusted odds ratio (OR adjusted for age, gender, marital status and hypertension status); CI = confidence interval.

Multivariable predictors of poor sleep quality

The multivariable binary logistic regression model identified specific independent predictors of poor sleep after adjusting for age, gender, marital status, and hypertension (Table 2 and Figure 2).

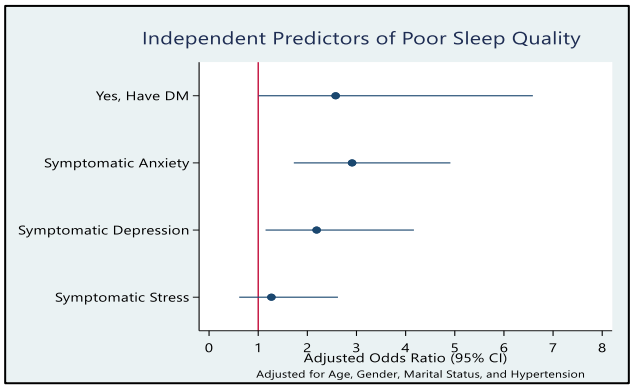

Figure 2: Forest plot of adjusted odds ratios (aOR) for independent clinical and psychological predictors of poor sleep quality.

For mental distress, anxiety was the strongest independent predictor and symptomatic anxiety participants were nearly three times higher rate of poor sleep compared to those with normal scores (aOR=2.88, 95% CI: 1.71-4.88,p<0.001). Besides, depression was also a significant predictor, with 2.21 times more likely to have poor sleep in symptomatic depression individuals than those with normal scores (aOR=2.21, 95% CI: 1.16-4.21, p=0.016). Clinically, diabetes mellitus remained a significant independent risk factor, increasing the odds of poor sleep quality by 2.63 times (aOR=2.63, 95% CI: 1.02-6.75, p=0.045). Notably, while stress was significant in the bivariate analysis, it did not reach statistical significance in the adjusted model (aOR=1.28, p=0.499).

The reliability of this model was confirmed by a mean VIF of 1.50, with all individual variables scoring below 3.0, indicating no significant multicollinearity. Furthermore, the Hosmer-Lemeshow test (chi^2=3.74, p=0.810) demonstrated an excellent goodness-of-fit between the model and the observed data.

DISCUSSION

This study identified a 39.3% prevalence of poor sleep quality among non-medical university staff in Myanmar, highlighting a significant poor sleep quality rate in frequently overlooked population group. The multivariable analysis showed that while demographic factors (age, gender, marital status) and hypertension did not independently influence sleep, three predictors (anxiety, depression, and DM) emerged as the most potent independent predictors.

Poor sleep quality prevalence, comparison and occupational context

Poor sleep quality prevalence of 39.3% among non-medical university staff in this study falls within the broad global range of 1.6% to 56.0% reported in systematic reviews.[4] This prevalence shows a unique "middle-ground" for university employees when compared to other Myanmar populations. For example, this 39.3% prevalence is notably higher than the 29% reported in general population. It may be due to the fact that the academic environment may impose additional sleep-related stressors than general population.[5] On the other hand, this sleep disruption burden is lower than that seen in higher-risk Myanmar groups, such as migrant workers in Malaysia (62.5%) or nurses in Yangon hospitals (63%).[7,9] The fact that university staff experience better sleep than nurses (39.3% versus 63%) may be attributable to the difference between regular academic working hours and the strenuous shift work found in 200-bedded hospitals.[7] Interestingly, the prevalence in our study is also lower than the 48.4% prevalence of poor sleep quality found among diabetic patients in a private hospital setting in Yangon.[5] This is highly consistent with our multivariable finding that Diabetes Mellitus (aOR=2.63) is a major driver of poor sleep, indicating that those with DM face a much higher burden than the relatively healthy majority of the university workforce.

Comparing prevalence with other countries, the prevalence observed in this study is slightly lower than the 56.7% reported among healthcare staff in Puducherry, India, but remains significantly higher than general community samples in similar regional contexts.8 Summarizing comparison with general population and frontline medical workers, though university non-medical staff may not face the same acute sleep deprivation as frontline medical workers, the chronic academic environment still imposes a substantial sleep burden, higher than the general population.

Psychological distress and diabetes mellitus

Our finding that anxiety (aOR=2.88) and depression (aOR=2.21) are leading predictors aligns with recent research in the International Journal of Community Medicine and Public Health, which consistently identifies psychological distress as a major determinant of sleep architecture among institutional employees.[12] The strong predictive power of anxiety and depression in this study is further supported by meta-analytic evidence showing that these mental disorders significantly alter sleep quality, specifically increasing sleep latency and decreasing slow-wave sleep.[4] This highlights that for university staff, psychological distress is not just a subjective feeling but a physiological disruptor of rest.[11]

Another independent key predictor of this research is diabetes mellitus (aOR=2.63, p=0.045). This statistical finding supports the hypothesis that metabolic health is closely linked to sleep stability. Biological mechanisms, such as nocturnal hyperglycemia and the discomfort associated with peripheral neuropathy, likely contribute to frequent sleep fragmentations. Furthermore, as noted by Htut et al and Kato, poor sleep can exacerbate poor glycemic control, potentially creating a deleterious bidirectional cycle for staff members living with chronic metabolic conditions.[5,6] Our finding of a 2.63-fold risk for diabetic staff aligns with epidemiological evidence linking sleep duration to cardiometabolic risk.[13] Chronic sleep deprivation can lead to systemic inflammation and metabolic consequences, potentially worsening the health outcomes of employees already managing chronic conditions.[2]

The anxiety-mediated stress effect

Among the predictors of poor sleep quality, one of the most noteworthy statistical outcomes was the stress. Although symptomatic Stress was strongly associated with poor sleep in the bivariate analysis (p=0.001), its statistical significance disappeared in the multivariable model (p=0.499). This indicates that the impact of stress on sleep is likely mediated through anxiety. In this population, once the physiological hyperarousal associated with anxiety is accounted for, stress alone does not independently predict sleep failure. This suggests that in academic settings, while 'stress' is a common complaint, the underlying anxiety is a true drive for poor sleep quality. This distinction is critical for daytime functioning and overall quality of life among the workforce. [11]

Impact of the global pandemic era on sleep trends

As data collection of this study occurred in the post-COVID-19 era, the broader temporal context of this study is important to be considered. Although this research identified significant psychological and clinical predictors of poor sleep, the lack of baseline (pre-pandemic) sleep quality data for this specific workforce is a limitation. This 39.3% poor sleep quality prevalence observed probably reflects a sustained shift in sleep health following the pandemic. However, without longitudinal baseline data, we cannot definitively verify that the current sleep burden is due to post-pandemic changes versus long-standing occupational or clinical factors.

In data collection, the use of internationally validated tools (PSQI and DASS-21) and standardized blood pressure measurements across seven different medical and allied universities is the major strength of this study. However, the nature of cross-sectional design of this study could not verify the establishment of definitive causality. Besides, reported diabetes mellitus status was one of the limitations in this study. In addition, as this study was conducted among specific population "non-medical staff from seven medical and allied universities", the results from this study may not be generalizable to the broader Myanmar population or medical professionals. If possible, future longitudinal research is needed to demonstrate how academic cycles (examination, graduation, start of the academic year, etc.) influence these predictors over time.

CONCLUSION

Overall, our study reveals that poor sleep among non-medical university staff in Myanmar (nearly 40%) is a significant public health issue. The findings indicate poor sleep is deeply rooted in clinical and psychological health, being more important than as a lifestyle issue. To be specific, study participants with diabetes mellitus and those experiencing symptomatic anxiety or depression face the highest risk of poor sleep quality.

Recommendations

Our study recommends that institutions should shift from generic health advice toward targeted clinical interventions to improve the health and productivity of the university workforce. Based on the findings, integrating sleep quality assessments into routine mental health screenings and diabetes mellitus management is essential. Findings from this study provide a baseline data required for developing occupational health policies, supporting the physical, mental and social well-being of non-medical university staff in Myanmar.

ACKNOWLEDGEMENTS

Authors would like to appreciate contributions from seven medical and allied universities in Myanmar namely: University of Medicine (1) Yangon, University of Medicine (2) Yangon, University of Dental Medicine (Yangon), University of Nursing (Yangon), University of Medical Technology (Yangon), University of Pharmacy (Yangon) and University of Community Health (Magway).

Funding: Grant was from Ministry of Health (Myanmar)
Conflict of interest: None declared
Ethical approval: The study was approved by the University of Public Health, Yangon, Myanmar: UPH-IRB(2024/PhD/4)
AI Disclosure: The authors used AI tools for grammar check, refinement and technical language editing to ensure clarity for an international audience.

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Cite this article as: Mauk KKA, Mon AS. Clinical and psychological predictors of poor sleep quality among non-medical university staff in Myanmar: a cross-sectional study. Int J Community Med Public Health 2026;13:3393-9.