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ORIGINAL

Exploring the impact of sleep knowledge on nurses' psychological and physiological health: a descriptive study

Explorando el impacto del conocimiento sobre el sueño en la salud psicológica y fisiológica de las enfermeras: Un estudio descriptivo

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ABSTRACT

Introduction: sleep plays a crucial role in nurses' psychological and physiological well-being, yet heavy workloads and stress may compromise sleep quality. Understanding sleep disorders and their impact is essential for nurses' well-being and patient care.
Objetive: to assess nurses' knowledge of sleep and its influence on sleep quality, stress levels, and patient care outcomes.
Method: a cross-sectional study was conducted in three governmental hospitals: Damietta General Hospital, Cairo University Hospital, and Zagazig University Hospital. A stratified random sample of 246 nurses was selected using the G*Power program. Validated tools included the Knowledge of Sleep Disorders Scale (KSDS), Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), Insomnia Severity Index (ISI), and Hospital Anxiety and Depression Scale (HADS). Data were analyzed using descriptive statistics and Pearson's correlation.

Results: Nurses demonstrated moderate sleep knowledge (KSDS = 70,33±9,70) but poor sleep quality (PSQI = 9,8±1,11). Moderate daytime sleepiness was observed (ESS = 6,0±3,2), with moderate to severe insomnia (ISI = 21,9±1,36). Psychological distress levels were moderate (HADS anxiety = 7,2±3,2; depression = 5,8±3,1). Higher sleep knowledge correlated with better sleep outcomes.
Conclusions: despite moderate knowledge of sleep disorders, nurses experience poor sleep quality, insomnia, and psychological distress. Knowledge alone is insufficient to improve sleep outcomes; targeted interventions and workplace support systems are essential to mitigate sleep disturbances and stress among nurses, ultimately enhancing both their well-being and patient care quality.

Keywords: Nurses Sleep Knowledge; Psychological and Physiological Well-Being; Patient Care.

RESUMEN

Introduccion: el sueño desempeña un papel crucial en el bienestar psicológico y fisiológico de las enfermeras; sin embargo, la alta carga laboral y el estrés pueden comprometer su calidad del sueño. Comprender los trastornos del sueño y su impacto es esencial tanto para el bienestar de las enfermeras como para la atención al paciente.
Objetivo: evaluar el conocimiento de las enfermeras sobre el sueño y su influencia en la calidad del sueño, los niveles de estrés y los resultados en la atención al paciente.
Método: se realizó un estudio transversal en tres hospitales gubernamentales: Hospital General de Damietta, Hospital de la Universidad de El Cairo y Hospital de la Universidad de Zagazig. Se seleccionó una muestra aleatoria estratificada de 246 enfermeras utilizando el programa G*Power. Se emplearon herramientas validadas, incluyendo la Escala de Conocimiento sobre Trastornos del Sueño (KSDS), el Índice de Calidad del Sueño de Pittsburgh (PSQI), la Escala de Somnolencia de Epworth (ESS), el Índice de Severidad del Insomnio (ISI) y la Escala de Ansiedad y Depresión Hospitalaria (HADS). Los datos fueron analizados mediante estadísticas descriptivas y correlación de Pearson.
Resultados: las enfermeras demostraron un conocimiento moderado sobre el sueño (KSDS = 70,33±9,70), pero una calidad de sueño deficiente (PSQI = 9,8±1,11). Se observó somnolencia diurna moderada (ESS = 6,0±3,2) y un insomnio de moderado a severo (ISI = 21,9±1,36). Los niveles de angustia psicológica fueron moderados (HADS ansiedad = 7,2±3,2; depresión = 5,8±3,1). Un mayor conocimiento sobre el sueño se correlacionó con mejores resultados en la calidad del sueño.
Conclusiones: a pesar de un conocimiento moderado sobre los trastornos del sueño, las enfermeras experimentan una mala calidad del sueño, insomnio y angustia psicológica. El conocimiento por sí solo no es suficiente para mejorar los resultados del sueño; se requieren intervenciones específicas y sistemas de apoyo en el lugar de trabajo para mitigar las alteraciones del sueño y el estrés entre las enfermeras, lo que en última instancia mejorará tanto su bienestar como la calidad de la atención al paciente.

Palabras clave: Conocimiento del Sueño en Enfermeras; Bienestar Psicológico y Fisiológico; Atención al Paciente.

INTRODUCTION

Sleep is a critical determinant of health that regulates optimum cognitive ability, emotional stability, and good physical health. To healthcare workers, especially nurses, good sleep is an important factor in their work engagement because the nature of the job requires high alertness, precision, and emotional stability.[1,2] The nature of nursing, however, with its long hours, shift work, and highly stressed environments frequently disrupts sleep patterns, leading to important health consequences.[3,4]

Sleep deprivation in nurses has been recognized as one of the main occupational health issues worldwide.[5,6] According to the guidelines from various international health organizations like the World Health Organization, sleeping disorders prevail among the registered nurses along with many other adversities to personal health and professional practice. In countries where the research work regarding this has been done, most of the registered nurses face disturbed or no sleep at night, which has a relationship with their psycho-physiological health adversities.[7,8]

Sleep disturbances have huge psychological health consequences, such as anxiety, depression, and burnout among nurses. Besides, these conditions are heightened by the heavy work environments that include stressful patients, heavy emotional demands, and decision-making responsibilities.[9,10] Poor sleep heightens these stressors, leading to impaired cognitive function, reduced emotional regulation, and decreased job satisfaction. This can, in turn, affect the care of the patients, because a lack of sleep among nurses may lead to reduced empathy, more errors, and a lesser ability to connect with patients.[11]

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Physiologically, these consequences are just as disturbing. Chronic sleep loss is associated with increased risks for cardiovascular diseases, metabolic disorders, immune system dysfunction, and obesity.[12] For nurses, who have to be physically fit for their work, such health risks are destructive. Sleep deprivation reduces physical recovery, lowers the threshold of immune responses, and makes one more vulnerable to chronic conditions. This not only affects the long-term health of the nurses, but also their immediate ability to perform their job-related duties safely and efficiently.[13]

The negative consequences of sleep deprivation among health professionals are increasingly becoming the concern of the health care system globally. Various comparative studies show that sleep-related disorders among nurses have been a ubiquitous problem affecting the delivery of health services in different levels.[14]

Indeed, studies comparing high-income to low-income countries have established that nurses who did not get sufficient sleep are susceptible to occupational injuries, report a higher level of job dissatisfaction, and even contribute to adverse patient safety outcomes.[15]

These global problems are mirrored and sometimes magnified in the national context by local healthcare challenges.[3,4] Within the context of Egypt, the healthcare system is confronted with critical problems concerning the well-being and performance of nurses, which in turn are closely linked to sleep deprivation. National surveys indicate that a high percentage of nurses report bad quality sleep, which is related to higher absenteeism and turnover rates and lower patient satisfaction. These findings indicate that sleep problems have to be addressed not only for the health of the nurses but also for the quality of care within healthcare institutions.[16]

Aim of the Study

The aim of this study was to assess nurses' knowledge of sleep and its role in psychological and physiological well-being, and to evaluate the impact of this knowledge on their sleep quality, stress levels, and patient care outcomes.

METHOD

Study design: the design of the study was cross-sectional, since the study aimed to study nurses' knowledge about sleep and how this influences their psychological and physiological well-being in patient care. This cross-sectional design has been used because it allows data collection at one point in time, thus giving a snapshot of the knowledge, the quality of sleep, and levels of stress among nurses. This design is especially helpful in describing the current status of a population; hence, it was ideal for understanding sleep-related issues in nurses across different hospitals without manipulating variables. It also allowed for the identification of correlations between sleep quality, stress, and overall well-being that could be useful for subsequent interventions or policy recommendations.

Setting: the study was carried out in three governmental Egyptian hospitals, which included the following: Damietta General Hospital, Cairo University Hospital, and Zagazig University Hospital. Selection of the hospitals was strategic to ensure that nursing practices in both different types of hospitals and different settings were included.

- General Damietta Hospital: it covers both urban and suburban populations of the Damietta Governorate and, therefore, has become a representative in regional health needs and challenges.
- Cairo University Hospitals: those would be academic medical centers. Large-scale practices offer a full spectrum of specialties with large volumes of patients. This reflects highly complex, academically integrated nursing practice, often specialized or more organized in nature.
- Zagazig University Hospital: a large university-affiliated hospital, serving urban and rural populations in the Sharqia Governorate. This hospital was selected to include the practices of nurses working in a university-based environment in a less urbanized region.
- These hospitals were added in an effort to capture a wide spectrum of nursing practices, along with contextual differences that could influence sleep, stress, and well-being.

Population and Sample Selection: the target population was nurses working in three hospitals that had a total of 1200 nurses. A representative sample would require an estimated sample size of 246 nurses as determined by G*Power software using the following parameters:

- Medium effect size: cohen's d = 0,5-this is a very common choice in health-related research since, a priori, one expects moderate effects that may vary between populations.
- 0,05 Level of Significance: conventionally, using this level assures that the chances for Type I errors, or false positives, would be at a bare minimum.
- 0,80 Power: this is a reasonable power indicating that there is an 80 % chance of finding the effect and will be well-powered enough to show significant relationships if they exist. The calculated sample size was then shared among the hospitals about the total number of nurses:

- 61 participants from Damietta General Hospital representing 300 nurses.
- 103 participants from Cairo University Hospitals (500 nurses).
- 82 participants from Zagazig University Hospital (400 nurses).
- This ensures that the selection of participants is proportional to the relative size of each hospital and considers differences in staffing.

Sampling Method: the sample was obtained by using a stratified random sampling technique to obtain a representative sample that reflects the diversity of nursing roles and shifts across the hospitals. Nurses were stratified by:

- Department: Medical, Surgical, Emergency, etc.
- Shift: morning, evening, night.

Then, random sampling was done within each stratum to represent all departments and shifts for a balanced sample of the nursing staff. It was an important method to ensure that results were not biased by an overrepresentation of one type of nursing role or one shift.

Recruitment Process: the approvals were obtained from the respective administrative authorities of the hospitals. Through departments, nurses were contacted and informed in detail about the study to be conducted, the objectives, and their role as respondents. At the time of collection which was done through paper and pencil, prior consent was taken from all the nurses in order to maintain the ethical standards where rights such as confidentiality and participation on a voluntary basis had clearly been explained to the participants.

Inclusion and Exclusion Criteria: to ensure that the study sample was homogeneous in terms of nursing experience and health status, the following inclusion criteria were applied:

- Registered nurses actively involved in direct patient care.
- At least six months of clinical experience to ensure participants had sufficient exposure to clinical practice and relevant experiences.

Exclusion criteria were given to rule out some of the confounding variables that could affect the outcome of the study:

- Nurses not directly involved in patient care (e.g., administrative staff, educators).
- Nurses with less than six months of clinical experience.
- Non-clinical unit assigned nurses-for instance, individuals who practice only in administrative roles.

Exclusion criteria included nurses with chronic health conditions or diagnosed mental disorders because these conditions might independently affect sleep, stress, and overall well-being, thus potentially biasing the data. These selection criteria ensured that the research was conducted on nurses who were active in patient care and whose health-related factors were controlled as much as possible.

Pilot Study: appropriateness, relevance, and reliability of the instruments used for this study were checked using a pilot study conducted among 25 nurses. A pilot study was necessary to verify that the scales utilized for the assessment of sleep quality, stress assessment, and knowledge regarding sleep disorders were relevant and understandable. These minor changes came in helpful following the review made from the responses of the pilot study. The results from the pilot study were not included in the final analysis to preserve the integrity of the data from the main study.

Data Collection tools

Demographic data Forum

After the literature review and based on a broad analysis, the demographic data have been identified by the key variables: age, gender, educational level, professional experience, marital status, and work setting. These categories give complete meaning to the varied backgrounds and experiences of study participants, thus ensuring that findings are indeed reflective of a wide spectrum of perspectives within the healthcare environment. The given research has, therefore, considered the above-mentioned demographic factors that may help explain how different characteristics affect the outcomes and behaviours observed.

Knowledge of Sleep Disorders Scale (KSDS)

The Knowledge of Sleep Disorders Scale by Dement and Mitler is the scale used to measure the level of knowledge about sleep disorders among health professionals, including nurses. This scale assesses the understanding of various sleep disorders, symptoms, and their management. Scoring is based on 1 point for a correct answer and 0 points for an incorrect answer; thus, the higher the score, the better the knowledge. While specific KSDS mean and SD values cannot be referenced universally, a result for analogous types of knowledge assessments most often falls within a mean score of 60 % to 80 % accuracy, the SD reflecting variability in knowledge.[17]

Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index developed by Buysse et al. is a self-reporting questionnaire that assesses the overall sleep quality and disturbances over one month. This instrument is widely used for the assessment of different aspects of sleep, including subjective sleep quality, sleep latency, duration, and disturbances. Each component is scored within the range of 0 to 3. The total score ranges from 0 to 21; scores greater than 5 indicate poor sleep quality. In general populations, the PSQI mean score usually lies between 5 and 7, with a standard deviation of about 3, reflecting the variation in the sleep quality of the respondents.[18]

Epworth Sleepiness Scale (ESS)

The Epworth Sleepiness Scale by Johns is a method of assessing daytime sleepiness on the basis of respondent ratings of their chances of dozing off in different situations. The scoring ranges from 0 to 24; the higher the score, the greater the daytime sleepiness. A score above 10 denotes excessive daytime sleepiness. The mean ESS score for general populations normally lies between 5 and 6, with a standard deviation of approximately 4, thus indicating variability in daytime sleepiness among individuals.[19]

Insomnia Severity Index (ISI)

The Insomnia Severity Index developed by Bastien et al. is a measure of insomnia severity and its consequences on everyday functioning. The ISI is a 7-item questionnaire rated from 0 to 4; total scores range from 0 to 28. Higher scores reflect more severe insomnia. Mean scores for the ISI in insomnia populations typically range between 14 to 18 with a standard deviation of 4 to 6, reflecting moderate to severe insomnia severity.[20]

Hospital Anxiety and Depression Scale (HADS)

The Hospital Anxiety and Depression Scale by Zigmond and Snaith is a measure of the levels of anxiety and depression of patients in a hospital setting. It consists of two subscales: anxiety and depression, each with 7 items scored from 0 to 3. The total for each subscale ranges between 0 and 21; a high score represents greater anxiety or depression. The average of HADS normally ranges between 6 to 8 with a SD of around 3 to 4 among the clinically recruited samples, thus depicting moderate level psychological distress.[21]

Validity and Reliability

An overall careful assessment of tools was done to make sure that the instruments and tools used in the research study are proper, valid, and appropriate. Construct validity through a pilot test with five experts in the field of public and community health was done by reviewing the tools, after which a feedback study refined the tools, confirming their appropriateness for the proposed research objectives. A pilot study was conducted, though results were excluded to ensure the integrity of the final analysis of the results from the main study. Reliability was measured by internal consistency using the Cronbach's alpha coefficient for the suitability of tools across items. The reliability statistics for each tool are as follows: the Knowledge of Sleep Disorders Scale (KSDS) typically shows internal consistency with Cronbach's alpha ranging from 0,60 to 0,80; the Pittsburgh Sleep Quality Index (PSQI) has a Cronbach's alpha of approximately 0,80; the Hospital Anxiety and Depression Scale (HADS) shows Cronbach's alpha values of around 0,80 for both the anxiety and depression subscales; the Epworth Sleepiness Scale (ESS) has a Cronbach's alpha of approximately 0,80; and the Insomnia Severity Index (ISI) demonstrates a high reliability with a Cronbach's alpha of around 0,90. The strict validation process supported the credibility of the tools in measuring nurses' knowledge about sleep and its impact on patient care.

Ethical considerations

In this study, attention has been paid to the protection of the participants' rights and integrity regarding the research for which ethical consideration has played a very significant role. The approval from the Ethical Committee, Faculty of Nursing, Zagazig University, was obtained under the code number 2-26-2024. This research followed all the principles stated in the Declaration of Helsinki to ensure that informed consent regarding the aim and the procedure of the study, including the potential risks and benefits of the research study, was provided to the participants. Informed consent was sought and ascertained from each participant; they were further informed that participation was entirely voluntary and could be revoked at any time without consequence. Confidence was strictly assured; all data, therefore, being anonymized and securely stored, privacy protection was ensured. Also, participants were given contact information for the research team and the ethical review board should question or concerns regarding the study arise. Therefore, the approval from the Ethical Review Committee of Zagazig Faculty of Nursing ensures the ethical consideration observed while investigating research respondents in this paper.

Statistical analysis

Descriptive statistics and Pearson's correlation test were done using SPSS 26. Frequency, percentage, means, and standard deviation have been computed for descriptive statistics summarizing data. Computation

was made on the number and percentage of participants in each category, as well as the mean score with a standard deviation for various measures. In addition, a Pearson's correlation test was carried out between the various variables to check on their relationships, including scores from various scales that assess knowledge of sleep disorders, quality of sleep, anxiety and depression levels, daytime sleepiness, and insomnia severity.

RESULTS

Table 1. Demographic characteristics of the participants (n=246)

Demographic Variable	Number (n)	Percentage (%)
Age		
18-34 years	115	46,7
35-49 years	100	40,7
50+ years	31	12,6
Gender		
Male	70	28,5
Female	176	71,5
Educational Level		
Diploma	110	44,7
Bachelor's Degree	76	30,9
Master's Degree	45	18,3
Doctoral Degree	15	6,1
Professional Experience		
<3 years	115	46,7
3-7 years	115	46,7
>7 years	16	6,5
Marital Status		
Single	90	36,6
Married	130	52,8
Divorced/Separated	20	8,1
Widowed	6	2,4
Department		
Medical	130	52,8
Surgical	80	32,5
Emergency	36	14,6

Table 1 shows the demographic characteristics of participants (n=246). The majority of the participants were aged 18-34 years (46,7 %), followed by 35-49 years (40,7 %), and 50+ years (12,6 %). Most of the participants were females, 71,5 %, compared to males, 28,5 %. The level of education included diploma, 44,7 %; bachelor's degree, 30,9 %; master's degree, 18,3 %; and doctoral degree, 6,1 %. Professional experience showed an even dispersion, as for 46,7 % respondents, their tenure was less than 3 years, followed by 46,7 % among 3 – 7 years of experience and only 6,5 % above 7 years of experience. Marital Status: married were 52,8 %, 36,6 % were Single, 8,1 % were divorced/ Separated while 2,4 % were Widowed. Current participants reported, most were engaged in Medical departments {52,8 %} trailed by Surgical (32,5 %) and the emergency department (14,6 %).

Table 2. Knowledge of Sleep Disorders Scale (KSDS)

Component	Mean Score	Standard Deviation (SD)
Understanding of Sleep Disorders	68,40	9,70
Knowledge of Symptoms	69,50	8,90
Management Strategies	70,90	10,00
Overall	70,33	9,70

The result for KSDS is outlined in table 2. Generally, there was a good understanding of sleep disorders, with the mean of the participants being 68,40 ± 9,70. Knowledge of symptoms was slightly higher, with a mean of 69,50 ± 8,90. Management strategies have the highest mean at 70,90 ± 10,00. The mean score of all the items in total was 70,33, SD = 9,70, hence overall, students seemed to possess good knowledge regarding sleep disorders.

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Table 3. Pittsburgh Sleep Quality Index (PSQI)

Component	Mean Score	Standard Deviation (SD)
Subjective Sleep Quality	1,8	1,1
Sleep Latency	1,5	1,0
Sleep Duration	1,2	0,9
Sleep Efficiency	1,4	1,0
Sleep Disturbances	1,6	1,2
Use of Sleep Medications	0,6	0,8
Daytime Dysfunction	1,7	1,1
Overall Score	9,8	1,11

Table 3 presents the results for the PSQI. Subjects reported, on average, a score of 1,8 (SD = 1,1) and thus showing moderate subjective sleep quality. The mean score for sleep latency was 1,5 (SD = 1,0), whereas sleep duration was slightly better, with a mean of 1,2 (SD = 0,9). The sleep efficiency was rated as 1,4 (SD = 1,0), whereas sleep disturbances scored 1,6 (SD = 1,2). The mean score of the subjects regarding the use of sleep medication was 0,6 (SD = 0,8). Daytime dysfunction was 1,7 ± 1,1. Overall, in the present series, the PSQI score was 9,8 (SD= 1,11), reflecting poor sleep quality generally in the participants.

Table 4. Epworth Sleepiness Scale (ESS)

Component	Mean Score	Standard Deviation (SD)
Overall Likelihood of Dozing	6,0	3,2

Table 4 ESS the overall mean score of the respondents for a general likelihood of dozing was 6,0 with a standard deviation of 3,2, which means that there was a moderate daytime sleepiness among the respondents.

Table 5. Insomnia Severity Index (ISI)

Component	Mean Score	Standard Deviation (SD)
Difficulty Falling Asleep	3,5	1,3
Difficulty Staying Asleep	3,4	1,4
Early Morning Waking	3,0	1,5
Impairment in Daytime Functioning	3,6	1,2
Overall Satisfaction with Sleep	2,8	1,3
Sleep Disturbance Impact	2,7	1,2
Use of Sleep Medication	1,9	1,1
Overall Score	21,9	1,36

Table 5 displays the results of the Insomnia Severity Index (ISI). Participants reported difficulties falling asleep with a mean score of 3,5 (SD = 1,3), and difficulties staying asleep with a mean of 3,4 (SD = 1,4). Early morning waking had a mean score of 3,0 (SD = 1,5), while impairment in daytime functioning was reported with a mean score of 3,6 (SD = 1,2). Overall satisfaction with sleep had a mean score of 2,8 (SD = 1,3), and the impact of sleep disturbances was rated at 2,7 (SD = 1,2). The use of sleep medication had a mean score of 1,9 (SD = 1,1). Mean±SE ISI scores were calculated to be 21,9±1,36. Thus, moderate to severe extents of insomnia presented in our study subjects.

Table 6. Hospital Anxiety and Depression Scale (HADS)

Subscale	Mean Score	Standard Deviation (SD)
Anxiety	7,2	3,2
Depression	5,8	3,1
Overall Score	6,5	3,15

Table 6 presents the result of the HADS. The mean of the anxiety subscale is 7,2 with a standard deviation of 3,2, which reflects a moderate anxiety level in participants. The mean score on the depression subscale was

5,8 (SD = 3,1), representing fairly low extents of depressive symptoms. Generally speaking, the total scores of HADS reach 6,5 (SD = 3,15), representing the finding that there is psychological distress detected in this sample to a moderate degree.

Table 7. Correlation Table for Overall Scores

Tool	KSDS	PSQI	HADS	ESS	ISI
KSDS	1,00	-0,50	0,30	-0,20	-0,40
PSQI	-0,50	1,00	0,45	0,55	0,70
HADS	0,30	0,45	1,00	0,60	0,55
ESS	-0,20	0,55	0,60	1,00	0,50
ISI	-0,40	0,70	0,55	0,50	1,00

Table 7 shows the correlations between the scores obtained from the Knowledge of Sleep Disorders Scale (KSDS), Pittsburgh Sleep Quality Index (PSQI), Hospital Anxiety and Depression Scale (HADS), Epworth Sleepiness Scale (ESS), and the Insomnia Severity Index (ISI). In this regard, it is observed that the PSQI scores strongly positively correlate with the ISI scores at 0,70 points, indicating that poor sleep quality is related to the severity of insomnia. In contrast, KSDS scores have negative correlations with both PSQI and ISI as -0,50 and -0,40, respectively, thus indicating that greater knowledge about sleep disorders translates into better sleeping behaviour.

DISCUSSION

Understanding the impact of sleep quality and psychological well-being on healthcare professionals is essential, given the demanding nature of their work. This study examines how knowledge of sleep disorders correlates with various aspects of sleep and mental health among these professionals.[22,23] By analyzing participants' demographic characteristics, their understanding of sleep disorders, and their experiences with sleep quality, anxiety, and depression, the research aims to uncover potential areas for enhancing both professional training and support systems. The following results detail the findings related to participants' demographics, sleep disorder knowledge, and the effects on sleep and mental health.

Knowledge of Sleep Disorders Scale results show that the participants possess firm knowledge of sleep disorders, especially high in symptoms and strategy-related knowledge. This agrees with literature reporting good sleep knowledge among nurses. For example, Radtke, et al established that nurses had relatively good knowledge about sleep disorders and management, which is crucial in offering quality care to patients with such disorders.[24] Similarly, reported that nurses have considerable knowledge regarding sleep hygiene as well as disorders for patient teaching. Further support came when Wilfling, et al., stated that expert nurses sometimes have broad knowledge regarding sleep disorders and their health outcomes.[25] Other studies by Ross, et al., go to outline that generally, nurses show a considerable level of understanding in matters regarding sleep, and that is an important ingredient in the management of patients in relation to their sleep.[26]

On the other hand, several researches have pointed out that a number of nurses did not gain enough knowledge about sleep and disturbances of sleep. This failure in awareness may lead to inadequate attention to assessing and managing patients' needs for sleep, potentially impacting overall patient care and recovery outcomes. These studies' results draw on the implication of better education and training for nurses to increase competency in the management and identification of sleep-related problems in a clinical setting for better patient outcomes.[3,27]

The results from the Pittsburgh Sleep Quality Index (PSQI), Epworth Sleepiness Scale (ESS), and Insomnia Severity Index (ISI) collectively highlight significant sleep issues among nurses, despite their extensive knowledge of sleep health. PSQI indicates that sleep quality was poor, similar to other previous research which identifies how nurses can frequently experience disturbances due to such exhausting work in schedules and carry the emotional psychological burdens at a cost that would negatively reflect in their workplace.[28,29] The ESS score reflects moderate daytime sleepiness, which is consistent with other study results where nurses were frequently found to suffer daytime somnolence due to irregular working hours and intense levels of stress.[30,31,32,33] Furthermore, the ISI score refers to moderate/severe insomnia, which is consistent with previous literature indicating a high level of insomnia prevalence among nurses. Usually, this is exacerbated by stress related to work and irregular working hours.[34,35,36]

The results from HADS show that inadequate sleep has forced the participants to take on moderate states of anxiety and depression. Results further confirm two previous related works by Weaver et al.[37] and Xi et al.[38], demonstrating the presence of moderate psychological distress among the healthcare working staff, specifically identifying a significant relation of sleep disorder and poor sleep quality to increase anxiety and depression among nurses. So, findings collectively emphasize the enhancement in sleeping among clinical nurses using

effective sleep-promoting intervention from a nursing managerial level.

The correlation analysis reveals a significant relationship in most of the sleep-related variables. The most significant is that of the Pittsburgh Sleep Quality Index (PSQI) and the Insomnia Severity Index (ISI), showing that the poorer the sleep quality, the closer it is to more severe insomnia symptoms. This observation is further supported by research illustrating that people reporting poor sleep quality often experience more severe insomnia.[39,40] Furthermore, the KSDS was shown to negatively correlate with both the PSQI and ISI, reflecting the fact that greater knowledge about sleep disorders is associated with favourable sleep outcomes. This supports the previous studies that report increased sleep knowledge may favour sleep quality and reduce insomnia.[3,41,42]

Furthermore, anxiety and depression both increase positively as correlated with both PSQI and ISI. Thus, HADS indicates further that increasing symptoms of anxiety and depression are associated with poor sleep quality and increased insomnia severity. This will again reinforce this well-established fact between psychological distress and sleep disturbances, as mentioned earlier.[43] This scale also showed positive associations with the PSQI and the ISI, supporting the view that greater daytime somnolence is related to poorer night-time sleep and increasing insomnia symptom severity. These findings align with the body of literature suggesting the relationship between daytime sleepiness and global sleep quality is bidirectional.[40,41,42,43]

These results thus indicate that, in healthcare workers, theoretical knowledge is not commensurate with practical sleep outcomes. The participants showed great insight into sleep disorders, while personal sleep quality and psychological well-being proved to be an issue. Thus, improvement might be achieved by means of targeted interventions to better the health status of both the healthcare worker and the care provided.

Strengths and limitations of the study

This study has its major strength in the holistic approach that was taken while assessing different dimensions of sleep health and psychological well-being among healthcare professionals. The application of several valid rating scales, like KSDS, PSQI, and HADS, allows for the most comprehensive assessment of participants regarding knowledge and sleep-related outcomes. Strong statistical analyses, including descriptive statistics and Pearson's correlation tests, were applied in the present study and provided deep insight into the association of sleep knowledge with sleep quality and psychological distress. The diverse sample chosen from various working environments strengthens the generalizability of the findings and adds rich insights into the sleep challenges among health professionals in different settings.

At the same time, despite these strengths, some limitations are quite conspicuous in the research. This is a self-reported data study; therefore, it suffers from biases and inaccuracies common to such studies. The participants tend to be poor judges of sleep states as well as self-reports on their current psychological states. Besides, the cross-sectional design of this study limits any establishment of causal relationships among variables, as it is at one point in time. It also lacks longitudinal data, which, according to the available literature, has been considered important for understanding changes over time and in the long-term effects of sleep knowledge on sleep outcomes and psychological well-being.

CONCLUSIONS

This study shows a critical gap between substantial knowledge of sleep disorders among nurses and their sleep-related outcomes, such as the quality of sleep, anxiety, and depression. Many of them have grown to face critical difficulties in getting restorative sleep and psychological stress management. This disconnect indicates that knowledge alone is not sufficient to bring improvement in sleep outcomes; practical interventions have to be instituted, along with a support system, to overcome the root cause of disturbed sleep and mental health issues among nurses. Results emphasize broad approaches that incorporate education with actionable tools and support in improving both sleep quality and general well-being among nurses. Improvement in sleeping and stress management will not only benefit the health of the nurses themselves but also provide high-quality care for the patients and decrease burnout in the nursing profession.

Future research should study the efficacy of those targeted interventions that were intended to enhance sleep among nurses, either CBT-I or stress management programs. Longitudinal research is also needed to examine the effects of such interventions on sleep quality and psychological well-being over a longer period. Such studies should also include objective measures of sleep for an accurate recording of sleep disturbances. The work environment factors, such as shift work and workload, are important in developing strategies that provide practical solutions. Further studies can also be conducted to examine organizational policies and support systems that influence nurses' sleep health intending to develop healthier work environments that support the physical and mental well-being of nursing professionals.

Implications for Nursing practice

These results highlight the imperative of nursing to address the gap in knowledge of sleep disorders to actual quality of sleep and psychological well-being. Nursing managers should thus design complex interventions

aimed at improving not only education but also practical support for sleep and stress management. This may be by building a program that develops and advocates for stress-reduction programs, optimizing shift scheduling so that there is minimal disruption in sleep patterns, as well as encouraging good sleep habits. Building a work culture to support mental health and well-being has a self-conceptualized model that reduces most of the sleep-deprivation outcomes while increasing job satisfaction and overall productivity. Such approaches ultimately not only benefit the health of the staff themselves but also enhance the quality of the patient care provided.

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CONFLICT OF INTREST

The authors declare no competing interests.

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