ISSN : 2579-4426
e-ISSN : 2580-6432
Fakultas Keperawatan Universitas Klabat
Bekerjasama dengan PPNI Provinsi Sulawesi Utara
Volume 4, No.2, Oktober 2020
Online Journal: http://ejournal.unklab.ac.id/index.php/nutrix

SELF-REPORTED SLEEP QUALITY AND ITS ASSOCIATION WITH DEMOGRAPHIC AND HEALTH-RELATED FACTORS AMONG EMERGENCY DEPARTMENT NURSES

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Abstract

Continual sleep loss and disorder among Emergency Department (ED) nurses may negatively impact the quality of care. ED nurses are expected to act with great pace and accuracy in a crowded and high-risk environment. Detail information regarding sleep quality (SQ) and its components among ED nurses is still limited in Indonesia. The study aimed to explore SQ of ED nurses and its relation to demographic and health-related factors. This study utilized a cross-sectional, correlational descriptive design with 65 samples recruited using total sampling technique from 3 EDs in Central Sulawesi. Descriptive statistics and bivariate analysis were performed to examine the association between variables. Global PSQI score was 5.5±2.0 with the prevalence of poor sleepers was 43.1%. Only body mass index (BMI) had correlation with SQ ($r=0.26$; $p<0.05$). ED nurses are recommended to reach the ideal body weight to get a bigger chance of having a better sleep. Further studies are required to evaluate interventions that might enhance SQ of ED nurses.

***Keywords**: Demographic, emergency department nurses, health-related factors, sleep quality.*

Abstrak

Gangguan tidur berkelanjutan pada perawat instalasi gawat darurat (IGD) dapat berdampak buruk pada kualitas pelayanan. Perawat IGD dituntut bertindak dengan kecepatan dan ketelitian tinggi dalam lingkungan kerja yang sibuk dan beresiko tinggi. Informasi detail terkait kualitas tidur dan komponennya pada perawat IGD masih terbatas di Indonesia. Penelitian ini bertujuan untuk mengeksplorasi kualitas tidur perawat IGD dan hubungannya dengan faktor demografik serta karakteristik kesehatan. Penelitian ini menggunakan desain deskriptif korelasi, berpendekatan potong lintang pada 65 sampel yang direkrut menggunakan teknik total sampling dari tiga IGD di Sulawesi Tengah. Statistik deskriptif dan analisa bivariat digunakan untuk mencari hubungan antar variabel. Skor global PSQI yaitu 5.5±2.0 dengan prevalensi kualitas tidur buruk sebanyak 43.3%. Indeks massa tubuh (IMT) ditemukan berkorelasi dengan kualitas tidur ($r=0.26$; $p<0.05$). Perawat IGD direkomendasikan untuk mencapai berat badan ideal guna meningkatkan peluang mendapatkan kualitas tidur yang baik. Penelitian selanjutnya diharapkan dapat mengevaluasi intervensi yang dapat meningkatkan kualitas tidur perawat IGD.

Kata Kunci: Demografi, faktor kesehatan, kualitas tidur, perawat instalasi gawat darurat.

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Introduction

Epidemiological studies show that sleep disturbance is a common problem among adults. About 30-35% of the world's population complain about sleep problems and 10% of cases were caused by chronic insomnia (World Health Organization, 2018).

Nurses are the largest group of health workers (about 50-60%) in the hospital, cover shifts 24-hour working hours a day, and have the longest duration of contact with patients (Ministry of Health Republic of Indonesia, 2013). Like the general population, one of the problems that occur in nursing practice is inadequate sleep. The prevalence of sleep problems tends to increase every year. When nurses experience disturbed sleep, it may lead to work negligence (Thayeb, Kembuan, & Khosama, 2015). Specifically, Weaver, Stutzman, Supnet, and Olson (2016) found that sleep quality created a bigger influence on nurses' performance than sleep quantity. A better sleep quality may reduce the chance of doing errors.

Emergency Department (ED) nurses play an important role in providing nursing care and must perform various tasks with high pressure and demands. The unpredictable severity and number of patients causing the workload seems very heavy. Therefore, sleep disorders are common among those who are working in the ED (Stathopoulou, Karanikola, Panagiotopoulou, & Papathanassoglou, 2011; Zeng et al., 2020). The prevalence of poor sleep quality among ED nurses population ranged from 36.5% to 92.1% (Kim, Kim, Park, Kang, & Choe, 2013; Suleiman, Hijazi, Kalaldeh, & Sharour, 2020; Thayeb et al., 2015). Like in other wards, shift work is a significant cause of poor sleep quality for nurses. This could happen due to disruption of the circadian rhythm of someone who works on night shifts. (Kim et al., 2013).

The understanding of sleep quality is quite complex and is related to various factors such as fatigue, work stress, or other psychological factors (Chien et al., 2013). A study by Tareluan, Bawotong, and Hamel (2016) showed that an increasing number of patients in ED lead to fatigue that affects the nurse's sleep patterns. In congruent with Saftarina and Hasanah (2014) that stated heavy workload can cause stress, fatigue, and ultimately affect both the quality and quantity of nurses' sleep. Scott, Arslanian-Engoren, and Engoren (2014) mentioned that in critical care units, poor sleep quality among nurses may determine the clinical decision, as the patients in these units are more vulnerable compare to other units.

During the night shift, sometimes nurses in the ED are found asleep and woken up by patients and their families. This may have impact on response time delays and often lead to dissatisfaction with the performance of nurses. Overall, sleep quality of nurses were worse than general populations. However, detail information for better understanding of sleep quality among ED nurses in Indonesia is still limited. Therefore, the aim of this study was to assess the sleep quality of ED nurses, including its components by self-reported questionnaire. We also tried to identify potential demographic data and health-related factors for sleep quality among ED nurses.

Methods

This study used a descriptive correlation with cross-sectional approach. The participants in this study were 65 ED nurses, recruited using total sampling technique from EDs of 3 general hospitals in Central Sulawesi, Indonesia. Data were collected through 1-month-long survey in July 2019. The inclusion criteria were ED nurses who has been working at ED with minimum of one year experience, able to communicate in Bahasa Indonesia, and willing to join the study. The head nurse and those who were on leave or illness condition were excluded from the study.

Demographic data included age, gender, tribe, religion, education, marital status, working experience in the ED, and hospital status. Health-related factors were smoking, exercise, and body mass index (BMI).

ED nurses' sleep quality was measured using Pittsburgh Sleep Quality Index or PSQI (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). This questionnaire consists of 24 questions, divided into 19 questions for participants and 5 for roommates (not included in the data analysis). There are 7 components for sleep quality assessment i.e. duration, latency, subjective sleep quality, duration, habitual sleep efficiency, use of sleep medication, and daytime dysfunction. Each components weighted in the range of 0-3. Therefore, global PSQI score ranged from 0-21. Scores more than 5 distinguished good and poor sleepers, where a higher score denotes worse sleep quality. The cronbach's alpha of PSQI in this current study was 0.77.

Permissions to conduct this study were obtained from the ethical committee of each hospital. Eligible nurses were listed from the head nurses. The researcher elucidated the purpose of study and procedure to potential participants. Anonymity and confidentiality were protected to all participants. As

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Online Journal: http://ejournal.unklab.ac.id/index.php/nutrix

an agreement to join this study, each participant signed the informed consent before data collection. Participants were free to withdraw at any time. Data were collected through face-to-face interview and questionnaires.

Data collected in this study were analyzed using statistical software. Data was checked for any errors that might appear after retrieval. Data analyses approaches included: 1) Descriptive statistics (mean, standard deviation, frequency, percentage, minimum, maximum) was employed to describe all variables; 2) Cronbach's alpha was used to determine the reliability of PSQI; 3) Mann-Whitney, Kruskal-Wallis, and Spearman Rank Correlation was utilized to identify associations between variables. The level of significance was set at 0.05.

Results

Demographic Data and Health-Related Factors of Participants

Table 1 portrayed demographic data of 65 ED nurses. The age of participants ranging from 21 to 57 years with a mean of 33.4 (SD=7.5). Majority of participants were female (55.4%) and married (81.5%). The top 3 tribes were Pamonanese (24.6%), Togeanese (18.5%), and Bugisnese (13.8%). Those who have faith in Islam (61.5%) were more dominant than any other believers. The highest level of education was Diploma III or DIII (75.4%). The mean of working experiences was 4.9 (SD=4.7), ranging from 1-33 years. More than three-fourth of ED nurses were working in public hospitals (83.1%). Non-smoking participants were 90.8% and those who routinely doing exercise only 29.2%. The mean of BMI was 23.3 kg/m^2 (SD=3.0), ranging from 16.8 to 34.7 kg/m^2.

Table 1 Demographic data and health characteristics of participants (n=65)

Variables	Mean±SD or n (%)	Min-Max
Age	33.4±7.5	21-57
Gender		
Male	29 (44.6)	
Female	36 (55.4)	
Tribe		
Bugisnese	9 (13.8)	
Javanese	6 (9.2)	
Pamonanese	16 (24.6)	
Bare'enese	7 (10.8)	
Gorontalonese	5 (7.7)	
Morinese	5 (7.7)	
Togeanese	12 (18.5)	
Others	5 (7.7)	
Religion		
Islam	40 (61.5)	
Christian	22 (33.8)	
Hinduism	3 (4.6)	
Education		
High School	2 (3.1)	
Diploma III	49 (75.4)	
Bachelor	5 (7.7)	
Professional Nurse or Higher	9 (13.8)	
Marital Status		
Married	53 (81.5)	
Single/Widowed	12 (18.4)	
Working Experience	4.9±4.7	1-33
Hospital Status		
Private	11 (16.9)	
Public	54 (83.1)	
Smoking		
No	59 (90.8)	
Yes	6 (9.2)	
Exercise		
No	46 (70.8)	
Yes	19 (29.2)	
Body Mass Index	23.3±3.0	16.8-34.7

Self-Reported Sleep Quality Components and Global PSQI

Table 2 showed the global PSQI score of 65 participants in the study ranged from 2-11 with a mean of 5.5 (SD=2.0). Approximately 56.9% of participants had good sleep quality, while the rest were poor sleepers. Daytime dysfunction were the main problem of sleep component with a mean of 1.3 (SD=0.5). Only a small percentage of participants (3.1%) reported they did not have any problem regarding daytime dysfunction. On the other hand, more than half participants complained only a very slight problem (64.6%). Sleep disturbances was the second higher problem with a mean of 1.2 (SD=0.4). A total of 51 participants (78.5%) experienced 1-9 sleep disturbances and 20% of participants had 10-18 scores. Sleep latency had a mean of 0.9 (SD=0.6).

More than half of participants took 16-30 minutes (60%) to fall asleep, whereas 24.6% only needed less than 15 minutes. The mean of subjective sleep quality was 0.1 (SD=0.3). Majority of participants reported their sleep subjectively as very good (90.8%). The mean sleep duration of participants was 0.8 (SD=0.5). Most participants had 6-7 hours of sleep (69.2%) and only 24.6% sleep over 7 hours. The mean of habitual sleep efficiency was 0.4 (SD=0.8). Majority of participants (70.7%) had sleep efficiencies of equal or greater than 85%, while 3.1% had less than 65%. The mean of use sleeping medication component was 0.7 (SD=0.8). Majority of the participants did not took sleeping medication (49.2%), while only 20% consumed it less than once a week.

ISSN : 2579-4426
e-ISSN : 2580-6432
Fakultas Keperawatan Universitas Klabat
Bekerjasama dengan PPNI Provinsi Sulawesi Utara
Volume 4, No.2, Oktober 2020
Online Journal: http://ejournal.unklab.ac.id/index.php/nutrix

Table 2 Frequency distribution and mean scores of sleep quality (n=65)

Sleep Score and Components	Mean±SD or n (%)	Possible Range	Actual Range
Global PSQI	5.5±2.0	0-21	2-11
Good sleepers	37 (56.9)		
Poor sleepers	28 (43.1)		
Subjective sleep quality	0.1±0.3	0-3	0-1
Very good	59 (90.8)		
Fairly good	6 (9.2)		
Fairly bad	0 (0)		
Very bad	0 (0)		
Sleep latency	0.9±0.6	0-3	0-2
≤15 minutes	16 (24.6)		
16-30 minutes	39 (60)		
31-60 minutes	10 (15.4)		
>60 minutes	0 (0)		
Sleep duration	0.8±0.5	0-3	0-2
>7 hours	16 (24.6)		
6-7 hours	45 (69.2)		
5-6 hours	4 (6.2)		
<5 hours	0 (0)		
Sleep efficiency	0.4±0.8	0-3	0-3
>85%	46 (70.7)		
75-84%	12 (18.5)		
65-74%	5 (7.7)		
<65%	2 (3.1)		
Sleep disturbances	1.2±0.4	0-3	0-2
0	1 (1.5)		
1-9	51 (78.5)		
10-18	13 (20)		
19-27	0 (0)		
Sleeping medication	0.7±0.8	0-3	0-2
Not during the past month	32 (49.2)		
Less than once a week	20 (30.8)		
Once or twice a week	13 (20)		
Three or more times a week	0 (0)		
Daytime dysfunction	1.3±0.5	0-3	0-2
No problem at all	2 (3.1)		
Only a very slight problem	42 (64.6)		
Somewhat of a problem	21 (32.3)		
A very severe problem	0 (0)		

Note: PSQI=Pittsburgh Sleep Quality Index.

The prevalence of sleep disturbances condition was determined by adding score categories of 2 and 3. As depicted in Table 3, "have to get up to use the bathroom" was the most frequent condition. There were 41 participants (63.1%) reporting of having this event. From those participants, 34 of them had nocturia one or two nights in a week.

The second highest prevalence of sleep disturbances was "wake up in the middle of the night or early morning", which experienced by 58.4% participants. More than half of the participants (52.3%) had sleep problem due to midnight arousal or in the early morning one or two nights a week. The other most common condition was "cannot get to sleep within 30 minutes" which reported by 27 (41.5%) participants, where all of them had difficulties in initiating sleep within 30 minutes one or two nights in a week.

Table 3 Conditions regarding sleep disturbances component (n=65)

Conditions	n (%)			
	1	2	3	2 + 3
Cannot get to sleep within 30 minutes	12 (18.5)	27 (41.5)	0 (0.0)	27 (41.5)
Wake up in the middle of the night or early morning	20 (30.8)	34 (52.3)	4 (6.1)	38 (58.4)
Have to get up to use the bathroom	20 (30.8)	34 (52.3)	7 (10.8)	41 (63.1)
Cannot breathe comfortably	10 (15.4)	2 (3.1)	0 (0.0)	2 (3.1)
Cough or snore loudly	14 (21.6)	6 (9.2)	1 (1.5)	7 (10.7)
Feel too cold	26 (40.0)	6 (9.2)	1 (1.5)	7 (10.7)
Feel too hot	20 (30.8)	8 (12.3)	2 (3.1)	10 (15.4)
Had bad dreams	14 (21.6)	1 (1.5)	2 (3.1)	3 (4.6)
Have pain	13 (20.0)	4 (6.1)	2 (3.1)	6 (9.2)

Note: 1=<1 time/week; 2=1 or 2 times/week; 3=≥3 times/week.

Factors Associated with Sleep Quality

The Mann-Whitney and Kruskal-Wallis test were utilized to measure the association between categorical data of demographics and health characteristics with global sleep score (see Table 4). The findings showed there were no relationships between variables among participants (p>0.05).

Table 4 Associations between demographic and health-related factors with sleep quality

Variables	n	Global PSQI	
		Mean±SD	p
Gender			0.78
Male	29	5.55±1.94	
Female	36	5.36±2.09	
Tribe			0.41
Bugisnese	9	4.56±3.21	
Javanese	6	5.00±1.79	
Pamonanese	16	5.81±1.87	
Bare'enese	7	4.57±1.90	
Gorontalonese	5	6.60±1.51	
Morinese	5	5.40±2.30	
Togeanese	12	5.50±1.00	
Others	5	6.40±2.07	
Religion			0.90
Islam	40	5.48±2.01	
Christian	22	5.45±2.15	

ISSN : 2579-4426
e-ISSN : 2580-6432
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Bekerjasama dengan PPNI Provinsi Sulawesi Utara
Volume 4, No.2, Oktober 2020
Online Journal: http://ejournal.unklab.ac.id/index.php/nutrix

Variables	n	Global PSQI	
		Mean±SD	p
Hinduism	3	5.00±1.00	
Education			0.29
High School	2	7.00±0.00	
Diploma III	49	5.55±2.07	
Bachelor	5	5.40±1.14	
Professional Nurse or Higher	9	4.56±2.07	
Marital Status			0.59
Married	53	5.49±2.04	
Single/Widowed	12	5.25±1.96	
Hospital Status			0.42
Private	11	5.82±1.33	
Public	54	5.37±2.12	
Smoking			0.94
No	59	5.44±2.05	
Yes	6	5.50±1.76	
Exercise			0.22
No	46	5.22±1.83	
Yes	19	6.00±2.36	

*Note: *p<0.05; **p<0.01 level (2-tailed); PSQI=Pittsburgh Sleep Quality Index.*

Table 5 presented the relationship between numerical data of demographic and health-related factors with sleep quality and its components using Spearman Rank Correlation. There was a moderate positive relationship between age and subjective sleep quality (r=0.45; p<0.01). Sleep latency was found negatively correlated with years of working experience in the ED (r=-0.37; p<0.01). Sleep disturbances component had a weak positive relationship with age (r=0.31; p<0.05) and BMI (r=0.29; p<0.05). The use of sleeping medication had a weak positive correlation with BMI (r=0.32; p<0.01). Three components of sleep i.e. sleep duration, habitual sleep efficiency, and daytime dysfunction were not correlated to all variables. Overall, global PSQI score as the representative of sleep quality had a weak positive association with BMI (r=0.26; p<0.05).

Table 5 Correlation coefficients of demographic and health-related factors and sleep quality

Variables	Age	BMI	Exp.
Global PSQI	0.11	0.26*	-0.05
Subjective sleep	0.45**	0.19	0.19
Sleep latency	-0.11	0.06	-0.37**
Sleep duration	-0.06	0.05	0.01
Sleep efficiency	-0.16	0.08	-0.02
Sleep disturbances	0.31*	0.29*	-0.05
Sleeping medication	0.20	0.32**	-0.11
Daytime dysfunction	-0.08	0.13	0.16

*Note: *p<0.05; **p<0.01 level (2-tailed); BMI=Body Mass Index; Exp.=Years of Experience.*

Discussion

The average age of respondents was 33.42 with intervals of 21-57 years. Thayeb et al. (2015) found that the age of emergency room nurses ranged from 20-40 years. Some of the nurses aged over 40 years rarely experiencing rotation to another wards of the hospital. Most of the respondents were women. Similarly, the study of Tareluan et al. (2016) found that in the ED, the nurses were predominantly women. There are two major of participants' tribes in this study, Pamonanese and Togeanese. These two tribes are originally form two regencies that the study was done.

Islam and Christianity are the religions most professed by the study participants, consistent with the distribution of religion in the province. Majority of ED nurses hold DIII degree. In contrast to the study by Tareluan et al. (2016), where most of their participants had bachelor degree. DIII program is a type of nursing education that produces graduates who have the competence to implement nursing care, predominantly refers to practice, so it tends to provide more action than analysis (Ekawati & Ardani, 2018).

Regarding marital status, the majority ED nurses were married. The findings were consistent with a study in the same population by Thayeb et al. (2015), where more than half of the participants were married. Married nurses, especially women, often face multiple role conflicts in family and work. The worst effect in this situation is that the quality of their services are poor (Wulandari & Dwiyanti, 2014).

The average of working experience among ED nurses was almost 5 years. Studies by Kasmarani (2012) and Suleiman et al. (2020) also found that the average years of experience of nurses in the ED was lower than 6 years. Job rotation was the main reason behind it. Periodic and proper job rotation can be used as a strategy to help nurses achieve better performance, expand skill and knowledge, and enhancing quality of care to patient. Moreover, it may increase job satisfaction, reduce conflict, and motivate nurses to keep focus on nursing career and prevent turnover rate (Pinhatti, Vannuchi, Sardinha, & Haddad, 2017).

Most of participants were working in public hospitals. This is quite plausible, where 2 out of 3 settings in this study took place in the ED of public hospitals. Majority of ED nurses in this study were non-smokers. This findings is similar with a study by Rahajeng and Tuminah (2011) who found only about one-third of their participants were smokers, while in contrast to Anggara and Prayitno (2013) were slightly more than half of participants were active smokers.

ISSN : 2579-4426
e-ISSN : 2580-6432
Fakultas Keperawatan Universitas Klabat
Bekerjasama dengan PPNI Provinsi Sulawesi Utara
Volume 4, No.2, Oktober 2020
Online Journal: http://ejournal.unklab.ac.id/index.php/nutrix

Participants who routinely do regular exercise were only about 29.2%. Workload, shift rotation schedule, and family are the reasons for the lack of time to do routine exercise. The mean BMI of the participants in this study was still considered in the normal category. In contrary to a study by Saftarina and Hasanah (2014) who reported the average BMI of hospitalized nurses was included in pre-obese group.

The main problem of sleep quality in this study participants was daytime dysfunction. In contrast, the result was inconsistent with Suleiman et al. (2020) who reported habitual sleep efficiency had the highest mean score among sleep components. Shift work may disrupt sleep and daytime functioning (Alshahrani, Baqays, Alenazi, AlAngari, & AlHadi, 2017). Shift rotation workers including nurses have worse daytime dysfunction than non-shift healthcare professionals. To deal with this situation, shift workers usually take naps between their shifts or consume a caffeinated drink to help them stay awake during work (Alshahrani et al., 2017).

The study revealed that the older the participants, the worse subjective sleep quality they reported. Increasing age compensates for both biological and psychological needs, resulting in stress levels that worsen the sleep quality (Susanti, Kusuma, & Rosdiana, 2017).

In this study, senior ED nurses had a faster ability to initiate sleep. This indicates that more experienced nurses have adapted to the work schedule arrangements in their work, particularly long-term night shift. Irregular daily life routines due to working on a rotational shift schedule may cause disruption of circadian rhythm and resulted in waking up too early or requiring longer sleep duration (Lin, Liao, Chen, & Fan, 2014).

Older ED nurses had a poorer sleep quality in this study. This findings is consistent with previous studies (Dong, Zhang, Sun, Sang, & Xu, 2017; Palhares, Corrente, & Matsubara, 2014). Normally, insomnia is not a part or aging process. However, disrupted sleep is common among older adults. This may lead to daytime dysfunction and change overall health. Less deep of sleep was also found among older adults, compared to younger people (Cole & Richards, 2007).

The current study found that BMI was correlated with sleep disturbances. Hargens, Kaleth, Edwards, and Butner (2013) mentioned that an increasing body weight and adiposity is associated with shorter sleep and poor sleep quality. Singareddy et al. (2012) also stated that those with higher BMI have a great chance to develop chronic insomnia. Disturbed sleep or chronic emotional stress are the determinants of short duration of sleep. Sleep duration was found similar to both obese and non-obese group without sleep disturbances or emotional stress. This may highlight the need of early detection and management of sleep disturbances as possible therapy for people with high BMI (Vgontzas et al., 2008).

The use of sleeping medication had a correlation with BMI in this study participants. Limited information available regarding the relationship between these two variables. In a study among Australian nurses and midwifes, about one third of participants used prescribed sleeping medication as their sleep aid (Dorrian et al., 2011). Shao, Chou, Yeh, and Tzeng (2010) reported that female nurses in Taiwan who took prescribed medication for sleeping had poorer physical health.

Overall, only BMI had correlation with sleep quality in ED nurses. This is consistent with studies by Beebe, Chang, Kress, and Mattfeldt-Beman (2017) and Zeng et al. (2020) who found that those with higher BMIs were poor sleepers. Nurses tend to do extra eating or snacking during the night shift or when awake at night and this may lead to a higher BMI. This was done as a way to help their sleep problems and was thought to increase happiness during work (Arslan & Aydemir, 2019).

Some limitations were found in the current study. The use of cross-sectional design is limited to generalizing the findings, since it can only highlights associations but not a causal relationship. The data collection were only taken from three EDs in Central Sulawesi, thus the study findings may not presented the whole status of sleep quality among ED nurses in other areas of the province. Future research should expand the scope in larger area to have better understand the sleep quality among this specific population. Response bias may happen, due to the use of self-rated questionnaire.

Conclusion

Among the components of sleep quality, daytime dysfunction was the main problem of study participants, but most of ED nurses were good sleepers. Older ED nurses experienced poor sleep quality and had more sleep disturbances. Senior ED nurses were faster to fall asleep, compared to those who had fewer years of work experience. In addition, those who were obese or belong to a high BMI group, had more disturbed sleep, tend to use sleeping medication, and generally poor of sleep quality. The findings in this study may stimulate

interventional studies regarding sleep, focusing on ED nurses.

Conflict of Interest

The authors report no conflicts of interest in this work.

Acknowledgments

The authors would like to thank MAPI Research Trust (Lyon, France), for allowing the access to Bahasa Indonesia version of PSQI. The authors are grateful for study participants and team who involved in the study for their collaboration. This study received no specific grant from any funding agency.

References

Alshahrani, S. M., Baqays, A. A., Alenazi, A. A., AlAngari, A. M., & AlHadi, A. N. (2017). Impact of shift work on sleep and daytime performance among health care professionals. *Saudi Medical Journal, 38*(8), 846-851. doi:10.15537/smj.2017.8.19025

Anggara, F. H. D., & Prayitno, N. (2013). Faktor-faktor yang berhubungan dengan tekanan darah di Puskesmas Telaga Murni, Cikarang Barat tahun 2012. *Jurnal Ilmiah Kesehatan, 5*(1), 20-25.

Arslan, M., & Aydemir, İ. (2019). Relationship between emotional appetite, eating attitudes, sleep quality, and body mass index in healthcare workers: A multi-centre study. *Psychiatry and Clinical Psychopharmacology, 29*(3), 346-353. doi:10.1080/24750573.2019.1627694

Beebe, D., Chang, J. J., Kress, K., & Mattfeldt-Beman, M. (2017). Diet quality and sleep quality among day and night shift nurses. *Journal of Nursing Management, 25*(7), 549-557. doi:10.1111/jonm.12492

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: A new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2), 193-213. doi:10.1016/0165-1781(89)90047-4

Chien, P.-L., Su, H.-F., Hsieh, P.-C., Siao, R.-Y., Ling, P.-Y., & Jou, H.-J. (2013). Sleep quality among female hospital staff nurses. *Sleep Disorders, 2013*, 6. doi:10.1155/2013/283490

Cole, C., & Richards, K. (2007). Sleep disruption in older adults. Harmful and by no means inevitable, it should be assessed for and treated. *The American Journal of Nursing, 107*(5), 40-49. doi:10.1097/01.Naj.0000268167.48606.74

Dong, H., Zhang, Q., Sun, Z., Sang, F., & Xu, Y. (2017). Sleep disturbances among Chinese clinical nurses in general hospitals and its influencing factors. *BMC Psychiatry, 17*(1), 241-241. doi:10.1186/s12888-017-1402-3

Dorrian, J., Paterson, J., Dawson, D., Pincombe, J., Grech, C., & Rogers, A. E. (2011). Sleep, stress and compensatory behaviors in Australian nurses and midwives. *Revista de Saúde Pública, 45*(5), 922-930. doi:10.1590/S0034-89102011005000059

Ekawati, K., & Ardani, M. H. (2018). Gambaran retensi perawat pelaksana di rumah sakit. *Jurnal Kepemimpinan dan Manajemen Keperawatan, 1*(2), 36-41. doi:10.32584/jkmk.v1i2.162

Hargens, T. A., Kaleth, A. S., Edwards, E. S., & Butner, K. L. (2013). Association between sleep disorders, obesity, and exercise: A review. *Nature and Science of Sleep, 5*, 27-35. doi:10.2147/NSS.S34838

Kasmarani, M. K. (2012). Pengaruh beban kerja fisik dan mental terhadap stres kerja pada perawat di Instalasi Gawat Darurat (IGD) RSUD Cianjur. *Jurnal Kesehatan Masyarakat Universitas Diponegoro, 1*(2), 767-776.

Kim, M. S., Kim, J. R., Park, K. S., Kang, Y. S., & Choe, M. S. P. (2013). Associations between sleep quality, daytime sleepiness, with perceived errors during nursing work among hospital nurses. *Journal of Agricultural Medicine and Community Health, 38*(4), 229-242. doi:0.5393/JAMCH.2013.38.4.229

Lin, S.-H., Liao, W.-C., Chen, M.-Y., & Fan, J.-Y. (2014). The impact of shift work on nurses' job stress, sleep quality and self-perceived health status. *Journal of Nursing Management, 22*(5), 604-612. doi:10.1111/jonm.12020

Ministry of Health Republic of Indonesia. (2013). *Riset kesehatan dasar (basic health survey) 2013*. Jakarta.

Palhares, V. d. C., Corrente, J. E., & Matsubara, B. B. (2014). Association between sleep quality and quality of life in nursing professionals working rotating shifts. *Revista de Saúde Pública, 48*(4), 594-601. doi:10.1590/S0034-8910.2014048004939

Pinhatti, E. D. G., Vannuchi, M. T. O., Sardinha, D. d. S. S., & Haddad, M. d. C. L. (2017). Job rotation of nursing professionals among the sectors of a hospital: A management tool in conflict resolution. *Texto & Contexto - Enfermagem, 26*(2), 1-9. doi:10.1590/0104-07072017001180015

Rahajeng, E., & Tuminah, S. (2011). Prevalensi hipertensi dan determinannya di Indonesia. *Journal of the Indonesian Medical Association, 59*(12).

Saftarina, F., & Hasanah, L. (2014). Hubungan shift kerja dengan gangguan pola tidur pada perawat Instalasi Rawat Inap di RSUD Abdul Moeloek Bandar Lampung 2013. *Jurnal Medula, 2*(02).

Scott, L. D., Arslanian-Engoren, C., & Engoren, M. C. (2014). Association of sleep and fatigue with decision regret among critical care nurses. *American Journal of Critical Care, 23*(1), 13-23. doi:10.4037/ajcc2014191

Shao, M.-F., Chou, Y.-C., Yeh, M.-Y., & Tzeng, W.-C. (2010). Sleep quality and quality of life in female shift-working nurses. *Journal of Advanced Nursing, 66*(7), 1565-1572. doi:10.1111/j.1365-2648.2010.05300.x

Singareddy, R., Vgontzas, A. N., Fernandez-Mendoza, J., Liao, D., Calhoun, S., Shaffer, M. L., & Bixler, E. O. (2012). Risk factors for incident chronic insomnia: A general population prospective study. *Sleep Medicine, 13*(4), 346-353. doi:10.1016/j.sleep.2011.10.033

Stathopoulou, H., Karanikola, M. N. K., Panagiotopoulou, F., & Papathanassoglou, E. D. E. (2011). Anxiety levels and related symptoms in emergency nursing personnel in Greece. *Journal of Emergency Nursing, 37*(4), 314-320. doi:10.1016/j.jen.2010.03.006

Suleiman, K., Hijazi, Z., Kalaldeh, M. A., & Sharour, L. A. (2020). Factors associated with sleep quality among emergency nurses in Jordan. *Sleep and Vigilance, 4*(1), 11-16. doi:10.1007/s41782-019-00082-4

Susanti, E., Kusuma, F. H. D., & Rosdiana, Y. (2017). Hubungan tingkat stres kerja dengan kualitas tidur pada perawat di Puskesmas Dau Malang. *Nursing News: Jurnal Ilmiah Keperawatan, 2*(3), 164-173.

Tareluan, D. G., Bawotong, J., & Hamel, R. (2016). Hubungan antara beban kerja dengan gangguan pola tidur pada perawat di instalasi gawat darurat non trauma RSUP Prof. Dr. RD Kandou Manado. *Jurnal Keperawatan, 4*(2).

Thayeb, R. R. T. A., Kembuan, M. A. H. N., & Khosama, H. (2015). Gambaran kualitas tidur pada perawat dinas malam RSUP Prof. Dr. RD Kandou Manado. *e-CliniC, 3*(3). doi:10.35790/ecl.3.3.2015.10457

Vgontzas, A. N., Lin, H. M., Papaliaga, M., Calhoun, S., Vela-Bueno, A., Chrousos, G. P., & Bixler, E. O. (2008). Short sleep duration and obesity: The role of emotional stress and sleep disturbances. *International Journal of Obesity, 32*(5), 801-809. doi:10.1038/ijo.2008.4

Weaver, A. L., Stutzman, S. E., Supnet, C., & Olson, D. M. (2016). Sleep quality, but not quantity, is associated with self-perceived minor error rates among emergency department nurses. *International Emergency Nursing, 25*, 48-52. doi:10.1016/j.ienj.2015.08.003

World Health Organization. (2018). *World Health Statistics 2018: Monitoring Health for the SDGs Sustainable Development Goals*: World Health Organization.

Wulandari, D., & Dwiyanti, R. (2014). Hubungan antara konflik peran ganda dengan stres kerja pada perawat wanita yang sudah menikah. *Psycho Idea, 12*(2), 33-41. doi:10.30595/psychoidea.v12i2.1545

Zeng, L.-N., Yang, Y., Wang, C., Li, X.-H., Xiang, Y.-F., Hall, B. J., . . . Xiang, Y.-T. (2020). Prevalence of poor sleep quality in nursing staff: A meta-analysis of observational studies. *Behavioral Sleep Medicine, 18*(6), 746-759. doi:10.1080/15402002.2019.1677233