Factors Predicting Sleep Quality in Sepsis Survivors: A Cross-Sectional Study

Kewalin Pongsuwun, Wimolrat Puwarawuttipanit, Ruttanaporn Kongkar, Yong Rongrungruang*

Abstract: Sepsis is a systemic inflammatory response to infection resulting in multiorgan dysfunction and failure. Sepsis incidence is rising globally; however, advancements in sepsis management have improved survival rates. Many sepsis survivors experience poor sleep, which is associated with higher mortality and slower recovery. This cross-sectional study aimed to identify factors predicting sleep quality among sepsis survivors during hospitalization. The study included 138 sepsis survivors aged over 18 years who were admitted to the general medical wards at a super-tertiary hospital in Bangkok, Thailand. Research instruments included the Personal Information Questionnaire, the Medical History Questionnaire, the Charlson Comorbidity Index, the Verran and Snyder-Halpern Sleep Scale, the Caring Professional Scale, and the Depression Anxiety Stress Scale-21. Descriptive statistics were employed to describe the characteristics of the participants, and multiple regression analysis was utilized to investigate the factors influencing sleep quality.

Of the 138 sepsis survivors, 73 (52.90%) experienced poor sleep quality. Together, five predictive variables explained 47.50% of the variance in their sleep quality with statistical significance. Healthcare personnel support was the strongest predictor of sleep quality in sepsis survivors, with anxiety, comorbidities, depression, and stress following in significance. This finding highlights the importance of healthcare personnel support. Nurses should assist sepsis survivors through psychological support, understanding, and information to reduce anxiety, depression, stress, complications, or severity of comorbidities. Addressing these problems through targeted interventions and comprehensive support strategies is crucial for enhancing their sleep quality, ultimately leading to long-term positive health outcomes.

Keywords: Anxiety, Comorbidity, Depression, Healthcare personnel support, Predictors, Sepsis, Sleep quality, Stress

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Introduction

Annually, sepsis occurs in roughly 276-678 people per 100,000 worldwide.[1] However, advances in sepsis resuscitation have also led to a rising number of sepsis survivors. In Spain, studies on sepsis trends have shown a steady decline in hospital mortality rates from 25.70% in 2005 to 17.90% in 2019.[2] Similarly, in China, sepsis-related deaths dropped from 80.69% in 2006 to 66.95% in 2020.[4] In addition, a Norwegian report (2008-2021) revealed a yearly decrease of 0.61% in age-standardized sepsis mortality.[3]

Sepsis survivors often suffer from symptoms or health problems such as cognitive, psychological, and health impairment.[5] Sleep quality problems have a significant impact on sepsis survivors during hospitalization. Studies have observed sleep disorders during sepsis and in long-term survivors.[6-7] For instance, Wilcox et al. investigated survivors of critical illnesses, including patients with sepsis, and found that 65% of them experienced poor sleep quality.[8] Additionally, the admission diagnosis of sepsis was linked to shorter total sleep time and reduced sleep efficiency. Song et al.[7] found that 6.4% of sepsis survivors were diagnosed with a sleep disorder within 1 year. The impact observed was that sepsis survivors with a sleep disorder had a higher risk of five-year all-cause mortality than those in the pre-sepsis sleep disorder group.[7] Moreover, sleep deprivation has been associated with alterations in the immune system, leading to a chronic inflammatory state that slows recovery and increases sepsis severity or recurrence.[9-10] A meta-analysis[11] found that 16.4% of adult survivors were readmitted to the hospital with another sepsis diagnosis at one year. Furthermore, adults with sleep disorders had an estimated mortality rate of 9.3%, which is a significant predictor of increased mortality.[12]

Previous studies have identified factors associated with poor sleep quality in hospitalized patients, including critical illness, the post-COVID-19 period, and other medical conditions.[13] Nevertheless, factors related to sleep quality among sepsis survivors have not been reported. Moreover, only a few reports have been published on sleep quality in sepsis survivors. Therefore, exploring the factors that influence sleep quality could help healthcare personnel play a crucial role in promoting sleep quality if they understand these predictors.

Conceptual Framework and Literature Review

The theory of unpleasant symptoms (TOUS) proposed by Lenz et al.[14] was used in this study. The TOUS comprises three major components: 1) symptoms, 2) influencing factors, and 3) performance. Symptoms may interact with one another, potentially triggering or exacerbating each other. Moreover, influencing factors may affect the symptom experience. Additionally, through feedback, symptoms may also impact influencing factors, and changes in performance can, in turn, influence both the symptoms and the factors that influence them.

This study focused on two primary components of the theory: 1) symptoms, which were perceived as unpleasant experiences resulting from changes in an individual's physical and mental aspects, occurring either as a single symptom or as interconnected symptoms defined by sleep quality, and 2) influencing factors, which contribute to symptoms or affect the perception of symptom experiences across various dimensions. These influencing factors were categorized into three main types: physiological (defined by comorbidities), psychological factors (defined by anxiety, stress, and depression), and situational factors (defined by the support of healthcare personnel).

Based on a literature review, sepsis survivors had a 62.30% increased comorbidity index.[15] A previous study on critically ill patients, including those with sepsis, revealed that comorbidities were significantly associated with sleep quality.[16] Furthermore, anxiety, stress, and depression among sepsis survivors within the first 24

hours after discharge from intensive care were found to be as high as 67%, 46%, and 49%, respectively, possibly due to factors such as treatment procedures, illness severity, and the use of medical devices.[15,17] While previous studies have not identified a direct correlation between sleep quality and anxiety, stress, or depression. However, a nearby study of critically ill patients, including those with sepsis, showed that sleep quality in the ICU is associated with biological factors related to anxiety.[18] Additionally, stress is positively correlated with poor sleep quality and insomnia.[19] Finally, ICU survivors with depression symptoms were likely to experience sleep disturbances.[20]

Support from healthcare professionals plays a crucial role in recovery, positively influencing health outcomes[21] and reducing poor sleep quality by 52%.[22] Additionally, a recent study on patients in the ICU, including those with sepsis, suggests that additional factors beyond the five predictive variables should be considered, such as environmental factors like noise and light, physical discomfort, and treatment factors, as these were identified as barriers to sleep.[23]

Study Aim

This study aimed to identify factors predicting sleep quality among sepsis survivors during hospitalization.

Methods

Design: This study employed a descriptive cross-sectional design, with findings reported following the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement Checklist.

Sample and Setting: The sample consisted of people with surviving sepsis >18 years old who had been treated in the general medical inpatient wards at a super tertiary hospital in Bangkok, Thailand, between May and August 2024.

Criteria for sepsis survivors: The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) defines sepsis as the organ dysfunction caused by a dysregulated host response to infection.[24] The Sepsis-3 criteria include confirmed or suspected infection, indications of organ failure, and septic shock. Therefore, sepsis survivors do not meet the Sepsis-3 diagnostic criteria.

In this study, after patients with sepsis or septic shock were treated and their symptoms improved, researchers used a Quick Sequential Organ Failure Assessment (qSOFA) score of less than 2 points to assess survival from sepsis. This tool is a cost-effective, rapid, 2-minute bedside assessment designed for use in clinical settings. Other inclusion criteria were: 1) ability to understand and communicate in Thai, including listening, speaking, reading, and writing, and 2) for participants aged 60 and above, assessment of cognitive function using the Mini-Cognitive Assessment Instrument (Mini-Cog) with a score of ≥ 3. Exclusion criteria were people 1) with neurological disorders, cognitive impairments, or memory issues; 2) diagnosed with sleep disorders; or 3) taking medication that could affect sleep quality; and 4) pregnant or breastfeeding women.

Sample size: The sample size was calculated using G*Power software, with a power of the test of 0.95, a significance level (α) of 0.05, and five independent variables. The literature review showed no related studies; therefore, the R^2 value could not be determined. An effect size of 0.15, representing a medium effect size, was chosen in accordance with the guidelines of Polit and Beck.[25] This effect size is appropriate for nursing research involving several predictors. The G*Power calculation resulted in a required sample size of 138.

Ethical Considerations: This study was approved by the Human Research Ethics Committee, Faculty of Nursing, Mahidol University, and the Faculty of Medicine Siriraj Hospital (MU-MOU CoA No. IRB-NS2024/838.0403). All participants were informed about the study and their rights and provided written informed consent, indicating their willingness to participate.

Instruments: Five instruments were used for data collection. Permission to use all instruments, except for the personal information and medical history, was obtained prior to data collection. Cronbach's alpha coefficients were assessed in a trial with 30 patients who met the same criteria as the participants in the main study. The instruments were:

The Personal Information and Medical History Form for age, sex, marital status, educational attainment, and body mass index (BMI). Factors before hospitalization were underlying diseases, COVID-19 infection, caffeine intake, alcohol consumption and smoking, sleep problems before illness, and usage of sleeping pills or anxiolytics. Laboratory results were obtained on the first day of hospital admission with sepsis (serum albumin, serum lactate, neutrophil-to-lymphocyte ratio). Factors during hospitalization included pre-sleep activities, self-report contributing factors to sleep quality (physical, environmental, and treatment-related factors), diagnosis, infection site, treatment during sepsis, and length of hospital stay.

The Verran and Snyder-Halpern (VSH) Sleep Scale was developed by Snyder-Halpern and Verran[26] to evaluate sleep quality. The original version was in English and was translated into Thai by Rojjanakitti.[27] A linear scale from 0 to 10 is used, with each value representing different meanings based on the specific question. The tool contains 15 items across three dimensions: sleep disturbance, sleep effectiveness, and additional daytime sleep duration, such as "How much movement did you experience during sleep?" Total scores range from 0 to 150, with item 6 being a negative statement that must be reverse-scored before calculating the total score, which is categorized into five: 0-30 points indicate very poor sleep quality, 31-60 poor sleep quality, 61-90 moderate sleep quality, 91-120 good sleep quality, and 121-150 the best sleep quality. The Cronbach′s alpha coefficient was 0.82 in a trial with 30 participants and 0.93 in the actual study.

The Charlson Comorbidity Index (CCI), developed by Charlson et al.[28] to assess comorbidities, was used in its original English version. The instrument assigns scores based on the severity of 20 comorbid conditions and the use of one type of anticoagulant, with scores ranging from 1 to 6 points. Total scores range from 0 to 39. For patients without comorbidities, a score of 0 is assigned. Scores of 1-2 points indicate mild severity of comorbidity, 3-4 points indicate moderate severity of comorbidity, and scores greater than 4 points indicate highly severe comorbidity. An example item is: "Do you have liver disease, such as hepatitis B, hepatitis C, or cirrhosis?" The Cronbach's alpha coefficient was 0.88 in a trial with 30 participants and 0.97 in the actual study.

The Depression Anxiety Stress Scale-21 (DASS-21) was developed by Lovibond and Lovibond[29] to evaluate anxiety, stress, and depression. The researchers applied the Thai version translated by Sawang.[30] It consists of 21 items covering three psychological dimensions: anxiety (7 items), stress (7 items), and depression (7 items). Higher scores indicate more severe symptoms, whereas lower scores indicate normal or mild symptoms, for example, "I felt that life was meaningless." The Cronbach's alpha coefficient was 0.80 in a trial with 30 participants and 0.92 in the actual study.

The Caring Professional Scale (CPS) was developed by Swanson[31] and translated into Thai by Piyasiripan.[32] This instrument was used to evaluate care perceived by patients from healthcare providers. The tool consists of 18 items with both positive and negative questions (e.g., "Do you feel respected and valued by your healthcare provider?"). Three items are negative (items 1, 4, and 5) and must be reverse-scored. Total scores range from 18 to 90, with higher scores indicating greater perceived support from healthcare personnel. The Cronbach's alpha coefficient was 0.97 in a trial with 30 participants and 0.98 in the actual study.

Data Collection: Data were collected through interviews and questionnaires during the ward stay or just before hospital discharge. The questionnaires were bound into a single booklet, including the personal information and medical history questionnaires, CCI, VSH Sleep Scale, CPS, and DASS-21.

Data Analysis: The data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics were used to examine the data on personal characteristics and assess the variables using frequency, percentage, mean, standard deviation (SD), median, and interquartile ranges. The predictive power of the independent variables on the dependent variable was determined using multiple linear regression analysis with the Enter method at a significance level of 0.05. Statistical analyses were conducted in accordance with the necessary assumptions for each test, including linearity, absence of multicollinearity, normality, homoscedasticity, absence of autocorrelation, and a mean residual of 0.

Results

Sample characteristics

The study included a total of 138 participants. Results show that the average age of the participants was 64.36 years. The majority were women, were identified as married, and had completed elementary education. The three most common underlying diseases were hypertension, diabetes, and hyperlipidemia. Regarding laboratory tests on the first day of hospital admission for sepsis or septic shock, the mean levels of serum albumin, serum lactate, and the neutrophil-to-lymphocyte ratio were 3.09 g/dL, 2.75 mmol/L, and 15.66%, respectively. Regarding the site of infection, the urinary tract was the most common, accounting for 40.83%. Regarding self-reported contributing factors to sleep quality, environmental factors, including noise, were the most common. **Table 1** provides a summary of the participants' demographic characteristics.

Table 1. Characteristics of sepsis survivors in this study (N = 138)

Characteristics of sepsis survivors	Frequency	%
Age (years) (Mean = 64.36, SD = 15.26)		
20-39	11	8.00
40-59	40	29.00
≥ 60	87	63.00
Sex		
Female	72	52.20
Male	66	47.80
Marital status		
Married	98	71.00
Single	30	21.80
Divorced/ Widowed	10	7.20
Educational level		
Primary education	50	36.30
Secondary education	46	33.30
Bachelor's degree or equivalent	37	26.80
Higher than bachelor's degree	5	3.60
Body mass index (kg/m^2) (Min = 13.84, Max = 40.55, Mean = 22.62, SD = 5.23)		
< 18.5 (Underweight)	33	23.90
18.5-24.9 (Normal)	44	31.90
25.0-29.9 (Overweight)	23	16.70
> 29.9 (Obese)	38	27.50

Table 1. Characteristics of sepsis survivors in this study (N = 138) (Cont.)

Characteristics of sepsis survivors	Frequency	%
Before hospitalization		
Underlying diseases*		
Hypertension	81	29.35
Diabetes	65	23.55
Hyperlipidemia	59	21.38
Chronic kidney disease	38	13.77
Cardiovascular disease	33	11.95
COVID-19 infection	70	50.70
Caffeine intake	71	51.40
Alcohol consumption	40	29.00
Smoking	37	26.80
Sleep problems before illness	10	7.20
Usage of sleeping pills or anxiolytics	18	13.00
Laboratory results (on the first day of hospital admission with sepsis/septic shock)		
Serum albumin (g/dL) (Min = 1.8, Max = 8, Mean = 3.09, SD = 0.82)		
< 3.50 (Hypoalbuminemia)	107	77.60
3.50-5.20 (Normal)	29	21.00
> 5.20 (Hyperalbuminemia)	2	1.40
Serum lactate (mmol/L) (Min = 0.3, Max = 10.90, Mean = 2.75, SD = 2.07)		
0.50-2.20 (Normal)	78	56.50
2.21-3.99 (Hyperlactatemia)	34	24.60
≥ 4.00 (Severe levels of lactate)	26	18.90
Neutrophil-to-lymphocyte ratio (%)		
(Min = 0.00, Max = 97.30, Mean = 15.66, SD = 21.80)		
0 (Neutropenia)	2	1.40
1-2 (Normal range)	19	13.80
3-10 (Mild to moderate inflammation)	63	45.70
> 10 (Severe inflammation)	54	39.10
During hospitalization		
Pre-sleep activities*	65	45.14
Using a mobile phone	34	23.61
Meditation	28	19.44
Listening to music	11	7.64
Watching television	6	4.17
Self-report contributing factors to sleep quality		
Physical factors*		
Discomfort	29	37.70
Pain	19	25.40
Anxiety and stress	17	22.30
Dyspnea	6	7.70
Nocturia	5	6.90
Environmental factors*		
Noise	38	38.50
Unfamiliar surroundings	23	23.60
Lighting	19	18.90
Temperature	10	9.50
Hospital roommates	6	6.10
Uncomfortable bed	4	3.40

Table 1. Characteristics of sepsis survivors in this study (N = 138) (Cont.)

Characteristics of sepsis survivors	Frequency	%
Treatment-related factors*		
Intravenous fluids	21	48.30
Nursing activities	18	41.70
Urinary catheters	5	10.00
Diagnosed		
Sepsis	98	71.00
Septic shock	40	29.00
Infection site*		
Urinary tract	49	40.83
Respiratory tract	47	39.17
Catheter-related bloodstream infections	24	20.00
Treatment during sepsis*		
Antimicrobial	138	49.28
Oxygen therapy	50	17.86
Vasopressor	48	17.13
Corticosteroid	26	9.29
Ventilator	18	6.43
Length of hospital stay (day) (Mean = 11.12, SD = 8.86)		

Note. *Participants may select more than 1 answer. Therefore, the total number can exceed 138.

Table 2 reveals that the participants had mild to moderate comorbidities, with a mean score of 2.04 (SD = 1.26). Additionally, anxiety, stress, and depression were common, with a significant portion falling into the mild or moderate categories. Healthcare personnel support was generally high, with over half of the participants receiving strong support, as indicated by a mean score of 71.39 (SD = 15.19). However, sleep quality was a major concern, as more than half of the participants reported poor sleep quality, with a mean score of 59.61 (SD = 18.38).

Table 2. Comorbidity, anxiety, stress, depression, healthcare personnel support, and sleep quality (N = 138)

Factors	Possible range	Actual range	n (%)
Comorbidity (Min = 0, Max = 5, Mean = 2.04, SD = 1.26, IQR = 1.00-3.00)			
No comorbidity	0	0	14 (10.20)
Mild	1-2	1-2	74 (53.60)
Moderate	3-4	3-4	46 (33.30)
Severe	> 4	5	4 (2.90)
Anxiety (Min = 0, Max = 17, Mean = 3.88, SD = 3.12, IQR = 1.00-6.00)			
Normal	0-3	0-3	59 (42.80)
Mild	4-5	4-5	43 (31.20)
Moderate	6-7	6-7	20 (14.50)
Severe	8-9	8-9	10 (7.20)
Extremely severe	≥ 10	10-17	6 (4.30)
Stress (Min = 0, Max = 16, Mean = 6.97, SD = 3.62, IQR = 4.75-9.00)			
Normal	0-7	0-7	67 (48.60)
Mild	8-9	8-9	39 (28.30)
Moderate	10-12	10-12	28 (20.20)
Severe	13-16	13-16	4 (2.90)

Table 2. Comorbidity, anxiety, stress, depression, healthcare personnel support, and sleep quality (N = 138) (Cont.)

Factors	Possible range	Actual range	n (%)
Depression (Min = 0, Max = 10, Mean = 3.86, SD = 2.22, IQR = 2.00-5.00)			
Normal	0-4	0-4	63 (45.70)
Mild	5-6	5-6	66 (47.80)
Moderate	7-10	7-10	9 (6.50)
Healthcare personnel support (Min = 42, Max = 90, Mean = 71.39, SD = 15.39, IQR = 57.00-90.00)			
Poor	18-42	42	1 (0.70)
Moderate	43-66	45-66	57 (41.30)
High	67-90	67-90	58 (58.00)
Sleep quality (Min = 16, Max = 102, Mean = 59.61, SD = 18.38, IQR = 45.00-73.00)			
Very poor sleep quality	0-30	16-30	7 (5.10)
Poor sleep quality	31-60	32-60	73(52.90)
Moderate sleep quality	61-90	63-89	51 (37.00)
Good sleep quality	91-120	92-102	7 (5.10)

Table 3 displays the linear correlation between the independent variables and sleep quality. The results indicate a significant positive correlation between healthcare personnel support and sleep quality (r = 0.520). On the other hand, comorbidity, anxiety, stress, and depression were negatively correlated with sleep quality with statistical significance (r = -0.373, r = -0.547, r = -0.420, and r = -0.431, respectively).

Table 3. Correlation between factors and sleep quality among sepsis survivors (N = 138)

Factors	1	2	3	4	5	6
1. Comorbidity	1					
2. Anxiety	0.278*	1				
3. Stress	0.202*	0.411*	1			
4. Depression	0.216*	0.471*	0.300*	1		
5. Healthcare personnel support	-0.247*	-0.445*	-0.296*	-0,267*	1	
6. Sleep quality	-0.373*	-0.547*	-0.420*	-0.431*	0.520*	1

Note. *p < 0.001

Factors predicting sleep quality

Multiple linear regression analysis with the Enter method. Our findings revealed that healthcare personnel support (β = 0.285, p < 0.001), anxiety (β = -0.233, p = 0.004), comorbidity (β = -0.171, p = 0.011), depression (β = -0.161, p = 0.028), and stress (β = -0.157, p = 0.028) are significant predictors of sleep quality in sepsis survivors. Furthermore, these factors collectively explained 47.5% of the variance in sleep quality (R^2 = 0.475, F = 23.886, p < 0.001) (**Table 4**).

Table 4. Multiple linear regression model: predictors of sleep quality in sepsis survivors (N = 138)

Factors	b	SE_b	β	t	p-value
Constant	56.439	7.984		7.069	< 0.001
Comorbidity	-2.496	0.974	-0.171	-2.564	0.011
Anxiety	-1.371	0.474	-0.233	-2.892	0.004
Stress	-0.797	0.358	-0.157	-2.224	0.028
Depression	-1.335	0.599	-0.161	-2.228	0.028
Healthcare personnel support	0.340	0.086	0.285	3.970	< 0.001

Note. R = 0.689, R^2 = 0.475, Adjust R^2 = 0.455, F = 23.886

Discussion

Our findings revealed that the participants had poor sleep quality, accounting for 52.90%. This may be explained by factors linked to disease progression. Sepsis can cause acute disruptions in sleep, such as a dysregulated REM-NREM sleep cycle and fragmented sleep.[9] At the molecular level, clock genes dysrhythmia and altered immune function are strongly associated, particularly in sepsis. The expression patterns of clock genes and the overall transcriptome become disrupted during critical illness and sepsis.[6] Moreover, the circadian rhythm of melatonin secretion is altered during severe sepsis.[33] Based on the above, these contribute to sepsis-induced sleep disturbance. This study also found other factors contributing to poor sleep quality in the participants, including environmental, physical, and treatment-related factors. These findings are similar to those of a study in South Korea, which reported factors contributing to poor sleep quality in the intensive care unit, with 20 cases of sepsis, including discomfort, treatment or procedure activities, and environmental factors such as noise and light. Moreover, more than half of the sample consisted of older adults 60 or older who exhibited changes in sleep architecture, including increased sleep latency, decreased sleep efficiency, and reduced total sleep time. This finding is consistent with Wilcox et al.,[8] which observed that 65% of critical illness survivors experienced poor sleep quality.

Interestingly, this study illustrated how comorbidity, anxiety, stress, depression, and healthcare personnel support predict sleep quality. Regarding comorbidities, the participants had mild to moderate conditions, which may be because more than half of the participants were older adults who experienced age-related deterioration, which increases their risk of developing multiple chronic diseases. Moreover, individuals with multimorbidity demonstrated a significantly higher risk of poor sleep quality and were more likely to experience short sleep duration (< 6 hours) (OR = 1.39, 95% CI: 1.27, 1.51).[34] This study illustrated that the most common underlying disease was hypertension (58.70%). Li et al.[35] found that the prevalence of poor sleep quality among patients with hypertension was 52.5%. Furthermore, specific symptoms of chronic diseases, particularly those related to hypertension, such as headache, chest pain, dizziness, and shortness of breath, are associated with sleep problems and frequently contribute to poor sleep quality. Moreover, individuals with comorbidities often use polypharmacy, which can impact sleep efficiency and quality as many commonly prescribed medications may interfere with sleep. Medications such as antihypertensives, antidepressants, antiepileptics, corticosteroids, decongestants, and diuretics have all been linked to insomnia. These findings were consistent with another study,[16] which found a positive correlation between the severity of comorbidities and sleep quality.

In our study, anxiety, depression, and stress were found to be significant predictors of sleep quality, consistent with Apitzsch et al.[36] These researchers demonstrated that sepsis survivors had psychological impairments, such as discomfort and anxiety, as they coped with the pain and suffering from sepsis and near-death experience. Therefore, this study found that more than half of the participants experienced anxiety, stress, and depression. Recent studies have also shown that anxiety is linked to pre-sleep arousal, sleep behaviors, and ruminative thoughts, which can impair sleep regulation, leading to insomnia and reduced sleep quality.[37] Stress can activate the hypothalamic-pituitary-adrenal axis, which helps regulate sleep and wakefulness. Therefore, stress may interfere with the physiological wake-sleep cycle. Furthermore, depression may reduce the time taken to enter rapid eye movement (REM) sleep and lower electroencephalogram (EEG) delta power during non-REM sleep, consistent with another study[18] observing that patients with anxiety were 23.13 times more likely to experience disturbed sleep at night compared with those without anxiety. Additionally, high perceived stress was positively correlated with poor

sleep quality and insomnia among people hospitalized in the intensive care unit during the COVID-19 pandemic.[19] Yet another study[20] of 112 adult ICU survivors in the United States demonstrated that trauma-related and depression symptoms were strongly associated with sleep disturbances.

Our findings demonstrate that more than half of the sepsis survivors (58%) received high-level healthcare personnel support. This support also improves satisfaction with rehabilitation information, follow-up care, aids, and the hospital's social services[38] and reduces poor sleep quality by 52%.[22] Similarly, a meta-analysis[39] showed that nursing interventions had a beneficial impact on sleep quality.

Limitations

The study was conducted at a single hospital in Bangkok, Thailand, so the generalizability of the findings to other populations, regions, or healthcare settings is limited. Furthermore, the study only included sepsis survivors admitted to a general medical ward, potentially excluding those treated in outpatient settings. Moreover, future research should explore additional factors like socioeconomic status, medication use, or lifestyle factors like diet and exercise. Additionally, studies should be conducted over a longer period to track how these factors influence sleep quality and long-term health outcomes post-sepsis. Expanding the research across different regions and healthcare settings would also improve the generalizability of the findings.

Conclusion and Implications for Nursing Practice

This cross-sectional study highlighted factors that predict sleep quality, among which healthcare personnel support was the best predictor of sleep quality in sepsis survivors. Nurses play a key role in enhancing sleep quality among sepsis survivors, which is vital for recovery and reducing mortality. Providing psychological support to reduce anxiety, depression, and stress is essential. Effective management of comorbidities and personalized sleep-promoting strategies, such as sleep hygiene education, should be implemented. Comprehensive discharge planning ensures continued care, while interdisciplinary collaboration addresses the complex needs of survivors. Self-assessment and self-monitoring of sleep quality based on the predictive factors identified in this study are recommended. Moreover, addressing these problems through interventions and comprehensive support strategies is crucial for improving sleep quality, leading to long-term positive health outcomes among sepsis survivors.

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ปัจจัยทำนายคุณภาพการนอนหลับในผู้รอดชีวิตหลังภาวะเซ็พสิส : การศึกษาแบบภาคตัดขวาง

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บทคัดย่อ: ภาวะเซ็พสิส หรือกลุ่มอาการตอบสนองต่อการติดเชื้อทำให้มีการอักเสบทั่วร่างกายและการทำหน้าที่ของระบบอวัยวะผิดปกติจนถึงล้มเหลว มีอัตราเพิ่มขึ้นทั่วโลก อย่างไรก็ตาม ความก้าวหน้าในการจัดการภาวะเซ็พสิสส่งผลให้อัตราการรอดชีวิตเพิ่มขึ้น ผู้รอดชีวิตหลังภาวะเซ็พสิสจำนวนมากมีคุณภาพการนอนหลับที่ไม่ดี ซึ่งเกี่ยวข้องกับอัตราการตายที่สูงขึ้นและการฟื้นตัวที่ช้าลง การศึกษาแบบตัดขวางนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยทำนายคุณภาพการนอนหลับในผู้รอดชีวิตหลังภาวะเซ็พสิสขณะเข้ารับการรักษาในโรงพยาบาล การศึกษานี้รวมผู้รอดชีวิตจากภาวะเซ็พสิสจำนวน 138 คน มีอายุมากกว่า 18 ปี ซึ่งเข้ารับการรักษาหอผู้ป่วยอายุรกรรมทั่วไป โรงพยาบาลตติยภูมิขั้นสูงแห่งหนึ่งในกรุงเทพมหานคร ประเทศไทย เครื่องมือการวิจัยประกอบด้วยข้อมูลส่วนบุคคล ประวัติการรักษา Charlson Comorbidity Index, Verran and Snyder-Halpern Sleep Scale, Caring Professional Scale และ Depression Anxiety Stress Scale-21 ใช้สถิติเชิงพรรณนาในการอธิบายลักษณะของผู้เข้าร่วมการวิจัย และใช้สถิติการถดถอยพหุคูณในการตรวจสอบปัจจัยทำนายคุณภาพการนอนหลับ

จากผู้รอดชีวิตหลังภาวะเซ็พสิส 138 คน พบว่า 73 คน (ร้อยละ 52.90) มีคุณภาพการนอนหลับที่ไม่ดี โดยตัวแปรทั้งห้าร่วมกันทำนายคุณภาพการนอนหลับในผู้รอดชีวิตหลังภาวะเซ็พสิสได้ร้อยละ 47.50 การสนับสนุนจากบุคลากรทางสุขภาพเป็นตัวแปรที่ทำนายคุณภาพการนอนหลับในผู้รอดชีวิตจากภาวะเซ็พสิสได้ดีที่สุด โดยมีความวิตกกังวล โรคร่วม ภาวะซึมเศร้า และความเครียดเป็นปัจจัยรองลงมา ข้อค้นพบนี้ชี้ให้เห็นถึงความสำคัญของการสนับสนุนจากบุคลากรทางสุขภาพ พยาบาลควรสนับสนุนช่วยเหลือผู้รอดชีวิตหลังภาวะเซ็พสิส ผ่านการสนับสนุนทางจิตใจ ความเข้าใจ และให้ข้อมูลเพื่อช่วยลดความวิตกกังวล ภาวะซึมเศร้า ความเครียด ภาวะแทรกซ้อน หรือความรุนแรงของโรคร่วม การแก้ไขปัญหาเหล่านี้ด้วยโปรแกรมและกลยุทธ์การสนับสนุนที่ครอบคลุมเป็นสิ่งสำคัญในการปรับปรุงคุณภาพการนอนหลับ ซึ่งนำไปสู่ผลลัพธ์ด้านสุขภาพที่ดีในระยะยาว

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