

Research Paper

Relationship between Psychological Capital and Sleep Quality in Intensive Care Unit Nurses



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Citation Sajedi, S., Jafarjalal, E., Haghani, S., 2022. Relationship between Psychological Capital and Sleep Quality in Intensive Care Unit Nurses. *Journal of Client-Centered Nursing Care*, 8(2), pp. 139-146. <https://doi.org/10.32598/JCCNC.8.2.418.1>

doi <https://doi.org/10.32598/JCCNC.8.2.418.1>

**Article info:**

Received: 22 Jan 2022

Accepted: 04 Apr 2022

Published: 01 May 2022

Keywords:

Psychological capital, Sleep quality, Nursing, Intensive care unit

ABSTRACT

Background: Adequate sleep is essential for proper physical and mental functioning. This study aims to investigate the relationship between the psychological capital and sleep quality of nurses working in Intensive Care Units (ICUs).

Methods: This is a descriptive correlational study conducted in 2021. Participants were 200 ICU nurses selected from hospitals affiliated to Iran University of Medical Sciences using a proportionate stratified sampling method. Data were collected by McGee's Psychological Capital Questionnaire (PCQ) and the Pittsburgh Sleep Quality Index (PSQI) and were analyzed using Pearson correlation test in SPSS v.16. The significance level was set at 0.05.

Results: There was a significant negative relationship between PCQ subscales and the components of PSQI ($P < 0.05$). The nurses' psychological capital had a significant negative relationship with their working hours ($P < 0.001$), work experience ($P = 0.04$) and work experience in ICUs ($P = 0.03$). Moreover, their sleep quality had a significant relationship with their shiftwork status ($P < 0.001$) and work experience ($P = 0.04$).

Conclusion: Improved sleep quality is associated with increased psychological capital and its components in ICU nurses. Therefore, it is necessary for these nurses to have adequate and quality sleep for proper performance and success at workplace.

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Highlights

- To have a good physical and mental health, sufficient sleep is needed;
- Psychological capital is a set of sources that a person can use for success and can help improve work performance. These sources include self-efficacy, optimism, hope and resilience;
- There is a significant negative relationship between the components of psychological capital and sleep quality.

Plain Language Summary

Mental health is very important for nurses who are responsible for providing healthcare to patients. On the other hand, self-efficacy, optimism, hope and resilience as sources of psychological capital that can help to improve performance at workplace. The aim of this study was to investigate the relationship between psychological capital and nurses' sleep quality. The results showed that improvement in the sleep quality of nurses can improve their psychological capital and, thus, their performance.

1. Introduction

In the health care system, nurses play an important role in improving healthcare services. (Ebrahimi Monfared, Sadegh, & Gohar, 2017). Due to heavy workload and stressful work environment as well as some individual and family problems, nurses experience high psychological problems which can reduce their job satisfaction, commitment and attachment (Adib-Hajbaghery, Izadi-Avanji, & Akbari, 2012). Experiencing high work stress puts them at risk for illness and mental health problems (Farahati 2020). Therefore, it is necessary to study the mental health status of nurses and identify the psychological factors affecting their mental health (Jafari 2015). Sleep plays an important role in humans' health, learning process, and memory, and can affect their quality of life. Nursing is among the occupations that require night shift work associated with sleep disorders (Babamiri et al., 2017). Sleep quality is a key factor for overall health and well-being. Poor sleep quality is one of the important factors associated with chronic fatigue and a negative impact on job performance in nurses and can reduce both the quality and quantity of their works which affects their responses to the patients' needs (Samaha et al., 2007).

In recent years, Psychological Capital (PsyCap) is one of the phenomena that has shown a high potential in improving the health and performance of people in different work environments (Gohel 2012). PsyCap emphasizes one's abilities and positive psychological states such as well-being, happiness, emotional intelligence, wisdom, self-awareness, creativity, and opti-

mism (Salehi et al., 2012). PsyCap term was coined by Fred Luthans and Carolyn Youssef. In developing the framework of positive organizational behavior, they introduced positive PsyCap as a source of competitive advantage for organizations (Luthans, Youssef-Morgan & Avolio, 2007). PsyCap can play a very important role in improving the nurses' work performance. A study showed that PsyCap is associated with a variety of variables such as job performance, job commitment, job satisfaction, anxiety, and the ability to cope with stress and problems (Peterson, & Byron 2008; Ucol-Ganiron Jr, 2012). In PsyCap, the four components of resilience, self-efficacy, optimism, and hope with a positive interaction with each other, can improve the performance of medical staff, especially nurses (Kim, 2008). Considering the importance of PsyCap in nurses' performance and its key role in the quality of nursing care as well as the effect of nurses' sleep quality on their mental status especially in those working in Intensive Care Units (ICUs), there is a need for more study on nurses' PsyCap and sleep quality to gain insight. This insight is necessary not only to assess the current state of PsyCap and sleep quality in nurses, but also to draw the attention of health authorities to this issue and conduct more studies. This study aims to determine the relationship between PsyCap and sleep quality in ICU nurses.

2. Materials and Methods

This descriptive correlational study was conducted in 2021 on 200 ICU nurses selected from the hospitals affiliated to Iran University of Medical Sciences using a proportionate stratified sampling method. The sample size was determined using the following formula at 95%

confidence level and considering a test power of 80% and assuming that the correlation coefficient between PsyCap and sleep quality in nurses is at least 0.2 so that the relationship be statistically significant (Equations 1):

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2}{w^2} + 3 \dots \dots w = \frac{1}{2} \ln \rightarrow$$

$$1. \frac{1+r}{1-r} n = \frac{(1/96+0.84)^2}{(0.2)^2} + 3 = 200$$

The data were collected using a three-part questionnaire. The first part surveys the nurses' demographic information including: age, gender, educational level, marital status, shiftwork status, work experience, work experience in ICUs, overtime work, and underlying illness. The second part was the Psychological Capital Questionnaire (PCQ). This questionnaire has been developed by McGee (2011) and translated into Persian and validated by Golparvar (2013). The PCQ consists of 26 items and four subscales of self-efficacy (items 1-7), hope (items 8-14), resilience (items 15-20), and optimism (items 21-26), which are rated on a 6-point Likert scale (From 1=strongly disagree to 6=strongly agree). To obtain the total PCQ score, the subscale scores are summed up. The total score ranges from 26 to 156, with higher scores indicating a higher level of PsyCap. To compare the components of PCQ, the mean score of each component was calculated ranging from 0 to 100, and the results showed that the highest and lowest mean scores were related to the self-efficacy (76.52) and optimism (69.83), respectively. The validity and reliability of PCQ along with other forms of PsyCap have been examined in many studies where its acceptable validity and reliability has been reported. McGee (2011) determined the validity of this questionnaire by exploratory factor analysis and Varimax rotation on 26 questions. The Cronbach's alpha for self-efficacy, hope, resilience and optimism were obtained 0.88, 0.86, 0.83, and 0.83, respectively. The acceptable construct validity of the Persian version of PCQ using the exploratory factor analysis has been reported and the Cronbach's alpha of its subscales are reported 0.81, 0.86, 0.79, and 0.75, respectively (Golparvar, 2013). The internal consistency of the Persian version PCQ was assessed in the present study. The Cronbach's alpha coefficients for self-efficacy, hope, resilience and optimism were obtained 0.81, 0.91, 0.80, and 0.87, respectively. The third part is the Pittsburgh Sleep Quality Index (PSQI) which was developed by Buysse et al. (1989) at the Pittsburgh Institute of Psychiatry and has 18 items and seven subscales including subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleep medications, and daytime drowsiness. Each subscale yields a

score from 0=no difficulty to 3=severe difficulty and the total score ranges from 0 to 21. A score >5 is considered as a significant sleep disturbance. The internal consistency of PSQI using Cronbach's alpha is 0.83 (Buysse et al., 1989). The reliability of the Persian version of PSQI using Cronbach's alpha coefficient is 0.89 (Ehteshamzadeh, 2010). Due to the frequent use of PSQI in the nursing community, there was no need to re-evaluate reliability in the present study.

To perform sampling, first, the total sample size (n=200) was divided by the total number of population and multiplied by the number of nurses in ICUs of each hospital; hence, the share of each hospital in samples was determined. The researcher then referred to each hospital and selected nurses who met the inclusion criteria (One year experience) and were willing to participate in the study. Sampling and completion of questionnaires took about three months. The obtained data were analyzed using descriptive (frequency, mean, and standard deviation) and inferential (Pearson correlation test) statistics in SPSS software v.16.

3. Results

Most of nurses were in the age range of 30-39 years (43.2%) and female (83.5%). Moreover, 85.5% of them held a bachelor's degree, 14.5% held a master's degree, and 69.5% were married. Most of the nurses had rotational shiftwork, a work experience of 6-10 years and had less than 5 years of experience in ICUs (Table 1). Most of them worked overtime for <50 hours, and had no any underlying disease. Table 2 presents the Mean±SD PCQ and PSQI scores. The Mean±SD PCQ score was 120.61±17.68. The highest and lowest means belonged to the components of self-efficacy (33.79) and optimism (26.95), respectively. The Mean±SD score of PSQI was 8.81±3.62. The highest and lowest means belonged to the components of sleep duration (1.67), and use of sleep medications (0.41), respectively.

Table 3 represents the results of assessing correlation between the components of PCQ and PSQI. As can be seen, the correlation coefficients of self-efficacy (the first component of PCQ) with subjective sleep quality, sleep latency, sleep disturbances, daytime drowsiness, and the total score of sleep quality were -0.16, -0.32, -0.24, -0.26, and, -0.28, respectively (P<0.05) which indicates a statistically significant negative correlation between them. Therefore, it can be said that the reduction in these domains and improvement in sleep quality, causes an increase in self-efficacy.

Table 1. Demographic characteristics of the ICU nurses

Variables	Characteristics	No. (%)
Age (y)	<30	55(27.6)
	30-39	86(43.2)
	40 and above	58(29.2)
Gender	Female	167(83.5)
	Male	33(16.5)
Educational level	Bachelor's degree	171(85.5)
	Master's degree	29(14.5)
Marital status	Single	58(29)
	Married	139(69.5)
	Divorced	3(1.5)
Shiftwork status	Rotational	145(72.5)
	Fixed morning	40(20)
	Fixed night	15(7.5)
Work experience	<5	32(16.1)
	6-10	62(31.2)
	11-15	38(19.1)
	16-20	38(19.1)
	21 and above	(14.6)29
Work experience in ICU	<5	107(53.8)
	6-10	56(28.1)
	11-15	30(15.1)
	≤16	6(3)

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The correlation coefficients of hope (the second component of PCQ) with subjective sleep quality, sleep latency, sleep disturbances, daytime drowsiness, and the total score of sleep quality were -0.17, -0.22, -0.17, -0.33, and -0.24, respectively ($P<0.05$) which indicates a significant negative correlation between them, and it can be said that hope increases by the reduction in these domains and improvement in sleep quality.

The correlation coefficients of resilience (the third component of PCQ) with subjective sleep quality, sleep latency, sleep disturbances, daytime drowsiness, and the total score of sleep quality were -0.16, -0.16, -0.14, -0.33, and -0.2, respectively ($P<0.05$) which indicates a

significant negative correlation between them; therefore, resilience increases by a decrease in these domains and improvement in sleep quality.

The correlation coefficients of optimism (the fourth component of PCQ) with daytime drowsiness and the total score of sleep quality were -0.26 and -0.15, respectively ($P<0.05$) which indicates a significant negative correlation between them; hence, with a decrease in daytime drowsiness and improvement of sleep quality, optimism increases.

Finally, the correlation coefficients of total PCQ score with subjective sleep quality, sleep latency, sleep disor-

Table 2. Mean±SD of the nurses' psychological capital and sleep quality

Variables	Mean±SD
Self-efficacy	33.79±4.77
Hope	32.48±5.34
Resilience	27.4±4.61
Optimism	26.95±4.67
Overall psychological capital	120.61±17.68
Subjective sleep quality	1.52±0.77
Sleep latency	1.54±0.83
Sleep duration	1.67±0.99
Habitual sleep efficiency	0.67±0.95
Sleep disturbances	1.49±0/7
Use of sleep medications	0.41±0.84
Daytime drowsiness	1.5±0.94
Overall sleep quality	8.81±3.62

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ders, sleep disturbances, daytime drowsiness, the total score of sleep quality were -0.16, -0.22, -0.18, -0.33, and -0.24, respectively ($P<0.05$) which indicates a significant negative correlation between them; therefore, with a decrease in these domains and improvement of sleep quality, PsyCap increases.

4. Discussion

The findings of the current study showed that the Mean±SD PsyCap score of ICU nurses was 120.61±17.68. which is close to the value reported in other study (17.86) (Jafarizadeh, Sadeghi, & Azarbarzin,

2019). A study was found that nurses had a relatively high level of PsyCap; among the components of PsyCap, the highest score belonged to self-efficacy, and the lowest score belonged to resilience (Jafar Jalal et al., 2021). This is consistent with our results. In our study, nurses also had a high level of PsyCap and the highest and lowest means of PsyCap were related to self-efficacy and optimism components, respectively.

Another result of our study was the relationship between PsyCap and sleep quality such that better sleep quality was associated with more PsyCap. This is consistent with the results of other studies. A study empha-

Table 3. Relationship between psychological capital and sleep quality in ICU nurses

Psychological Capital	Sleep Quality*							Total
	Subjective Sleep Quality	Sleep Latency	Sleep Duration	Habitual Sleep Efficiency	Sleep Disturbances	Use of Sleep Medications	Daytime Drowsiness	
Self-efficacy	-0.16	-0.32	-0.07	-0.02	-0.24	-0.11	-0.26	-0.28
Hope	-0.17	-0.22	-0.03	-0.008	-0.17	-0.09	-0.33	-0.24
Resilience	-0.16	-0.16	-0.006	-0.012	-0.14	-0.08	-0.33	-0.3
Optimism	-0.1	-0.1	-0.004	-0.06	-0.11	-0.008	-0.26	-0.15
Total	-0.16	-0.22	-0.02	-0.02	-0.18	-0.08	-0.33	-0.24

* $P<0.05$.

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sized that PsyCap is a strong predictor of sleep quality (Hystad and Eid 2016). Since training programs can help modify dysfunctional beliefs about sleep (Morin, Blais, & Savard, 2002; Thakral et al., 2020), future experimental research as part of targeted sleep education programs can explore whether PsyCap training can minimize the impact of poor sleep quality (Sabot and Hicks 2020). A study was found that mental health, the quality of life, and hardship can predict the quality of sleep in nurses. Therefore, it was suggested that evaluating the sleep quality and its relationship with mental health, the quality of life, and hardship can provide valuable guidelines for improving nurses' sleep quality (Fatehi & Dobaradaran 2020). A study showed that psychological well-being is directly associated with optimal sleep quality and may moderate the effects of psychological risk factors. In this regard, the level of psychological well-being increases when the effects of psychological risk factors are moderated. Disturbed sleep is likely to lead to decreased levels of psychological well-being, and positive mental states can lead to improved sleep quality (Barber, Rupperecht, & Munz, 2014). On the other hand, a study reported that sleep disorders and mental health are related to each other, and one can be the cause of other (Mansouri, Mokhayeri, & Tavakol, 2016). According to the findings of the present study, the sleep quality of ICU nurses can be increased through improving their PsyCap. Due to the adverse effects of low sleep quality on the quality of care for patients, appropriate planning to improve the sleep quality of these nurses is necessary.

There were some limitations in this study. The first limitation was the use of a descriptive correlational method; hence, a cause-and-effect analysis is not logical. The second limitation was the mental preoccupation and high workload of nurses, which can affect the accuracy of their answers to the questions.

5. Conclusion

Improved sleep quality is associated with increased PsyCap in ICU nurses. In other words, the nurses' sleep quality can be improved by increasing their PsyCap. Therefore, they should have adequate and quality sleep for proper performance and success at workplace. In order to improve their PsyCap, it is suggested that educational and motivational courses be held periodically for them. Nurse managers and policymakers can use the findings, especially by considering PsyCap and its self-efficacy component, to develop programs to improve the quality of sleep in nurses.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Research Ethics Committee of Iran University of Medical Sciences (Code: IR.IUMS.REC.1399.1161). The study objectives were explained to the participants and they were assured that their information would be kept confidential. Written informed consent was obtained from them before completing the questionnaires.

Funding

Iran University of Medical Sciences financially supported the study.

Authors' contributions

Conceptualization, investigation, writing - original draft: Jafar Jalal and Sahar Sajedi; Methodology, writing - editing, and final approval: All authors; Supervision: Jafar Jalal.

Conflict of interest

The authors declare no conflict of interests.

Acknowledgments

The authors would like to thank Iran University of Medical Sciences for the financial support, the staff of Haft-e-Tir, Shohadae Yaftabad, Firoozgar, and Rasool-e-Akram hospitals and the nurses who participated in this study for their valuable support and cooperation.

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