

The Impact of Positive Psychological States in Predicting Sleep Quality Amongst Pregnant Women

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Abstract

Background: During pregnancy, due to special hormonal and physiological changes that occur in the body, sleep disorders are very prevalent; therefore, positive psychological states and emotions can have major impacts on overall sleep quality among pregnant women.

Objectives: The aim of this study was to examine the effect of 15 positive psychological states (trust in God, optimism, a sense of efficacy, accepting responsibilities, a sense of control, purposefulness, hope, meaningfulness in life, life satisfaction, positive mood and happiness, being social, self-esteem and self-worth, a sense of peace, appreciation, and forgiveness) on predicting sleep quality among pregnant women.

Materials and Methods: This descriptive study followed a correlational-predictive design. The statistical population of this study included all pregnant women referred to health care centers in Khash in the first half of 2015, which included 890 individuals. The sampling method was multistage cluster sampling. Overall, 268 questionnaires were distributed among pregnant women, who had the inclusion criteria of the current study, in order to be answer freely and voluntarily. Moreover, to collect data, two questionnaires including positive psychological states (PPS) and the Pittsburgh sleep quality index (PSQI) were used.

Results: The results of the correlation coefficient indicated that optimism, purposefulness, hope, meaningfulness in life, life satisfaction, positive mood and happiness, a sense of peace, trust in God and forgiveness were significantly related to high sleep quality ($P \leq 0.01$). However, sleep quality was not correlated with a sense of efficacy, accepting responsibilities, a sense of control, being social, and a sense of self-esteem and self-worth ($P \geq 0.05$). Additionally, the results of stepwise regression analysis showed that positives mood, meaningfulness in life and hope together predicted 0.47 of the variance in sleep quality among pregnant women ($P \leq 0.01$).

Conclusions: Since psychological states and emotions have great impacts on sleep quality of pregnant women, paying attention to women's psychological states and emotions, especially in the last trimester of pregnancy, seems essential.

Keywords: Positive Psychological States, Pregnancy, Sleep Quality

1. Background

Sleep is an essential biological function in humans and animals (1) and as a dynamic and highly organized process it constitutes an important part of life. The significance of sleep in health and disease has been considered from the time of Hippocrates and disturbed sleep is regarded as a major cause of suffering and sickness at any age (2). Sleep, as a biological process, which has significant impacts on people's behavior, psyche and health, is of great importance to humans and studies have shown that insufficient and poor sleep quality can have great effects on mental health and performance (3). During pregnancy, due to hormonal and physiological changes that occur in

the body, sleep disorders are very prevalent (4) and about one-third of all pregnant women experience sleep deprivation problems such that sleep disorders, in late pregnancy, are very common among pregnant women. Among the most common sleep disorders in the general population of pregnant women, the following can be mentioned: insomnia, sleep apnea, sleep abnormalities and sleep terrors (5). Although poor sleep quality and continuation of sleep disorders in pregnant women are correlated with their low mental health, only few studies have been carried out on poor sleep quality and its effects on pregnant women (6). In one of the latest studies conducted by Gwinnett et al. in 2014, the findings revealed that poor sleep quality is one of the risk factors for diabetes during preg-

nancy, such that subjects' poor sleep quality was significantly and strongly related to their diabetes during pregnancy (7). Therefore, since pregnancy is a very critical and crucial period for both the mother and the fetus, getting sufficient sleep and having good mental and psychological health in this period seems essential. One of the affecting factors, which is perhaps among the most important factors affecting the quality and quantity of mothers' sleep during pregnancy, is having positive psychological affections and states. Positive affections are emotional states that are accompanied by features including mood and feelings of pleasure leading to a sense of peace, happiness and dignity in humans. Positive states and emotions are very different in humans and they initiate from relatively subtle feelings of happiness to fairly stable pleasure in humans; therefore, the term positive affections is a very general term, which like an umbrella entails a broad range of positive psychological states from all short-term and unstable to long-term and quite stable states (8). Nowadays, with regards to positive and applied psychology, the main focus of psychologists and family counselors is on the strengths, personal characteristics, potential abilities and psychological states and affections of each individual, regardless of the degree of disorder or mental harm imposed on the person (9). Since increasing negative emotions in humans stimulates the immune system and this stimulation results in an increase in the levels of cytokines and stimulates the hypothalamus-pituitary axis in the brain, each negative psychological emotion can be considered as a predictor of poor mental and physical health including insomnia, the risk of death, heart disease and even cancer (10). In contrast, positive emotions and affections make people feel relaxed. In this regard, given the importance of positive affections and quality of sleep during pregnancy, the present study sought to determine the extent to which each of these 15 components of positive psychological states predict sleep quality among pregnant women referred to health care centers of Khash.

2. Objectives

The aim of this study was to examine the effect of 15 positive psychological states (trust in God, optimism, a sense of efficacy, accepting responsibilities, a sense of control, purposefulness, hope, meaningfulness in life, life satisfaction, positive mood and happiness, being social, self-esteem and self-worth, a sense of peace, appreciation, and forgiveness) on sleep quality among pregnant women.

3. Materials and Methods

The current study was descriptive following a correlational-predictive design. The statistical population of this study included 890 pregnant women referred to health care centers in Khash in the first half of 2015 to receive prenatal care. The sampling method was multi-stage cluster sampling, such that among three health care centers and seven health bases in the city, one center and four bases were selected randomly and 268 questionnaires were distributed among pregnant women, who had the inclusion criteria considered in this study, in order to be answered freely and voluntarily. Moreover, to determine the sample size, Cochran's formula was used. Before answering the questionnaires, the cases were screened, considering their mental conditions, depression, and anxiety, by a psychiatrist through conducting interviews and using the general health questionnaire (GHQ).

Inclusion criteria: Having at least a diploma, participating in the study voluntarily and signing a written consent, being pregnant for the first time, being in the age range of 23 to 28 years old. **Exclusion criteria:** Being diagnosed with psychosis or neurosis, drug addiction and substance abuse, meeting the full criteria for Axis I disorders based on the diagnostic and statistical manual of mental disorders, meeting the full criteria for a personality disorder, having a history of cognitive therapy, refusing to cooperate in the study, and being pregnant for the second time or more.

3.1. Data Collection Tools

3.1.1. Positive Psychological States Questionnaire

This questionnaire was developed and designed by Rajaei, Khoyneshad and Javanmard (11) and includes 96 items, that assess 15 positive psychological states (1. Trust in God, 2. Optimism, 3. A sense of efficacy, 4. Accepting responsibilities, 5. A sense of control, 6. Purposefulness, 7. Hope, 8. Meaningfulness in life, 9. Life satisfaction, 10. Positive mood and happiness, 11. Being social, 12. Self-esteem and self-worth, 13. A sense of peace, 14. Appreciation, 15. Forgiveness). This questionnaire is scored based on a Likert type scale from 1 to 5 (from totally disagree to totally agree), i.e. totally disagree, disagree, no idea, agree, and totally agree, respectively, received scores from one to five. Additionally, questions 7, 9, 11, 14, 15, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 32, 38, 39, 40, 44, 48, 49, 52, 54, 58, 59, 60, 61, 69, 70, 71, 75, 78, 79, 80, 81, 82, 84, 86, 90, 91, 92 and 93 are reversely scored. To calculate the reliability, Cronbach's alpha coefficient was used. For this purpose, a pilot study was conducted on 50 students. The Cronbach's alpha coefficient, calculated for the whole scale, was 0.83 and for each subscale, the coefficient varied from 0.75 to 0.87. In

addition, in the current study, the calculated alpha for the whole questionnaire was 0.79 (11).

3.1.2. Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh sleep quality index (PSQI) is a tool to measure multi-dimensional features of sleep quality (12). This questionnaire consists of 19 self-rated items used to measure subjects' sleep quality in the past month. In scoring PSQI, seven components (1. General description of the person's sleep quality, 2. Sleep latency, 3. Useful sleep duration, 4. Sleep efficiency, 5. Sleep disorders, 6. Used hypnotic drug, 7. Daily performance) should be examined. The minimum and maximum scores considered for each component ranged from 0 (lack of problem) to 3 (very serious problems). To obtain an overall score, the scores on all components should be summed up together and converted to a total score (0 to 21), top score in each component or in the overall score indicates poor sleep quality. Scores of 0, 1, 2 and 3 on each scale, respectively, represent the natural situation, mild, moderate and severe problems. Total scores of the seven scales form the overall score that ranges from zero to 21. Total score of 6 or more indicates poor quality of sleep. The validity and reliability of the Pittsburgh index and its sensitivity to study sleep quality was examined by several studies conducted in Iran and abroad ($\alpha = 89.6$ and $R = 0.88$). The reliability of this questionnaire was reported as 0.83, using Cronbach's alpha coefficient and the content validity of the sleep quality questionnaire has been confirmed (13).

4. Results

In the current study, the obtained data from 268 pregnant women, the mean age of whom was 26 years old, was used in the final analysis. The obtained results of the present study related to the main research question, which was the extent to which each of these 15 components of positive psychological states predicated sleep quality among pregnant women referred to health care centers of Khash, are presented in Table 1 and indicate that sleep quality is significantly and negatively correlated with trust in God ($r = -0.31$), optimism ($r = -0.27$), purposefulness ($r = -0.30$), hope ($r = -0.46$), meaningfulness in life ($r = -0.41$), life satisfaction ($r = -0.37$), positive mood and happiness ($r = -.55$), and a sense of peace ($r = -0.50$) at the level of $P \leq 0.01$. In addition, sleep quality was significantly and negatively related to forgiveness ($r = -0.26$) at a level of $P \leq 0.05$, such that among 15 components of positive psychological states (optimism, purposefulness, hope, meaningfulness in life, life satisfaction, positive mood and happiness, a sense of peace, trust in God, and forgiveness) are

related to high sleep quality. However, considering the relationship of sleep quality with a sense of efficacy, accepting responsibilities, a sense of control, being social, a sense of self-worth, and appreciation, no significant correlation was found ($P \geq 0.05$) (Table 1).

As it can be seen in Table 2, results of stepwise regression analysis conducted to predict sleep quality among pregnant women via positive psychological states reveal that in the first step, positive mood and in the second step, positive mood and meaningfulness in life together and in the third step, positive mood, meaningfulness in life, and hope together, respectively, predicted 0.31, 0.41 and 0.47 of the variance in sleep quality of pregnant women (Table 2).

5. Discussion

Today, clinical observations have shown that sleep problems and insomnia are the main reasons for many aggressive and violent behaviors, because lack of sleep and sleep disorders impair the function of the prefrontal cortex, leading to aggressive and violent behaviors (14). Additionally, sleep disorders have negative effects on people's mood (15). This is while about 20% of the adult population is affected by sleep problems (16). People, who experience sleep disorders, not only suffer from fatigue, but also from defects in cellular repair, defects in learning memory, increase in anxiety and decrease in quality of life. The results indicated that there was a significant relationship between sleep duration and professional operation as well as mental awareness of people. Moreover, in students, sleep deprivation can affect their academic status (17). Sleep is one of the basic human needs and in Maslow's needs hierarchy, it is placed in line with physiological needs. When sleep-wake cycle is disrupted, it may change other physiological functions and lead to a decrease in appetite and weight loss (18). One of the factors that play an important role in human health is sleep. The world health organization has considered sleep quality as one of the principles of primary health care on the agenda of the member states and defined it as follows: 'sleep is a physiological mechanism of the body in recovering the lost power and fatigue from physical activity during daily life and is an important criterion to maintain physical and mental health' (19). Since negative emotions are related to affections, general health and poor sleep quality (10), positive psychology aims to carry out studies in relation to anything that gives value to humans' life (20). Results indicated that positive emotional states have a great impact on sleep quality in all stages of life, especially pregnancy. In compliance with this, in a study conducted by Zhong, Gelaye, Sanchez and Williams, the results revealed that people, who suffered from depression, anxiety and stress

Table 1. Results of Correlation Matrix of Fifteen Positive Psychological States With Sleep Quality of Pregnant Women

Variables	Trust in God	Optimism	A sense of efficacy	Accepting responsibilities	A sense of control	Purposefulness	Hope	Meaningfulness in life	Life satisfaction	Positive mood	Being Social	A sense of self-worth	A sense of peace	Appreciation	Forgiveness
Sleep quality	-0.31 ^a	-0.27 ^a	0.09	-0.11	-0.07	-0.30 ^a	-0.46 ^a	-0.41 ^a	-0.37 ^a	-0.55 ^a	0.08	-0.10	-0.50 ^a	0.09	-0.26 ^b

^aSignificant at $P \leq 0.01$.^bSignificant at $P \leq 0.05$.**Table 2.** Results of Stepwise Regression Analysis Conducted to Predict Sleep Quality Among Pregnant Women Through Considering Positive Psychological States (N = 268)

Step	Personality Factor	R	R ²	Adjusted R Square	F	Sig	B	β	t	Sig
First step	Positive mood	0.55	0.31	0.30	124.39	0.00	-0.50	-0.55	11.15	0.00
Second step	Positive mood	0.64	0.41	0.41	98.40	0.00	-0.45	-0.50	-10.71	0.00
	Meaningfulness in life						-0.50	-0.33	-7.08	0.00
Third step	Positive mood	0.69	0.47	0.47	82.79	0.00	-0.32	-0.36	-7.00	0.00
	Meaningfulness in life						-0.54	-0.35	-7.88	0.00
	Hope						-0.26	-0.27	-5.51	0.00

during their pregnancy, had lower levels of sleep quality (4). In another study carried out by Mindell and Jacobson on sleep quality during pregnancy, the results showed that a large percentage of women experienced various disorders including frequent nighttime awakening, difficulty in falling sleep and signs and symptoms of sleep apnea during their pregnancy (5). According to previously conducted studies, sleep disorders and primary problems during pregnancy are correlated with severe nausea, preterm delivery, diabetes during pregnancy, and preeclampsia and examining the related literature has indicated the impacts of poor sleep quality among pregnant women on mood disorders and depression in late pregnancy (4). Moreover, some evidence has demonstrated that 24-hour disorders and poor sleep quality during pregnancy may be accompanied with some side effects including weight gain and abnormalities in blood sugar of the fetus. In short, getting enough sleep is of significant importance for having a safe delivery; therefore, disruption in the sleep system can cause serious complications. In this regard, doctors and counselors are recommended to stress the importance of training and providing sufficient information for mothers on having sufficient sleep during pregnancy, since based on estimations, only 40% of pregnant women and 30% of postmenopausal women get enough sleep for a few nights over a month (1). Therefore, considering the results of the current study and previously conducted studies, paying attention to mothers' psychological emotions, states and affections seems essential. When a mother has an ideal

and appropriate psychological condition, she easily goes to sleep; however, when a mother has poor psychological states and emotions, her amount of sleep decreases and this reduction in the amount of sleep will have negative effects on the fetus.

5.1. Conclusion

Health care professionals and doctors should consider the fact that during pregnancy, women's quality and amount of sleep decreases; therefore, when pregnant women refer to health centers, adequate explanations in relation to psychological and mental emotions and affections should be provided, owing to the fact that pregnant women's sleep is increasingly affected by their psychological states. Moreover, these pregnant women should be asked to use sleep medications very cautiously, since these drugs can bring risks to the fetus.

5.2. Limitations

One of the major limitations of the current study was subjects' socio-cultural features and conditions. Since the sample of this study only included pregnant women, who referred to health care centers in Khash and considering the fact that very few studies have been carried out to examine the relationship between sleep quality and positive psychological states among pregnant women, such that no previously conducted studies were found in this regard, it is recommended that future studies examine these variables in various cultures.

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Footnotes

Authors' Contribution: Mahmoud Shirazi and Mohammad Ali Fardin conceived and designed the evaluation, interpreted the data and revised the manuscript critically for important intellectual content. Ali Arab and Muhammad Ali Fardin performed the statistical analysis and revised the manuscript critically for important intellectual content. Gholamreza Sanagou participated in interpretation of the data and revised the manuscript critically for important intellectual content. Allah Nazar Alisofi collected the data and drafted the manuscript. All authors read and approved the final manuscript.

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