

The Effect of Peplau's Model Application on Sleep Quality of Women Waiting for Breast Biopsy Results

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ARTICLE INFO	ABSTRACT
Article type: Original article	Background & aim: During the waiting period for breast biopsy results, women experience sleep disorders. This study conducted to determine the effect of implementing Peplau's model on sleep quality of women waiting for the results of breast biopsy.
Article History: Received: 13-Mar-2022 Accepted: 07-Jan-2023	Methods: This randomized clinical trial was conducted in 2019 at two educational hospitals in Mashhad, Iran. Women who were eligible to enter the study were randomly assigned to the intervention (n=34) and control groups (n=34) by lottery method. The intervention group received a program based on the Peplau's model, included a face-to-face communication and three telephone follow-ups. The control group received conventional care. Data were collected using Pittsburgh Sleep Quality Index, in three stages of before sampling, before and two weeks after receiving the results. Data were analyzed using Chi-square, t-test and the analysis of variance with repeated measures.
Key words: Sleep Breast Biopsy Caring Models Women	Results: The mean score of sleep quality of women was 9.1 ± 3.2 in the intervention and 8.4 ± 2.6 in the control group before sampling. It was 8.2 ± 0.3 in the intervention and 8.3 ± 2.4 in the control group before receiving the result. However, two weeks after receiving result. It was 7.4 ± 2.7 in the intervention and 7.6 ± 2.8 in the control group. The analysis showed statistically significant difference between two groups in terms of sleep quality in different time periods ($P=0.01$). Conclusion: Considering the positive effect of the Peplau's model application on improving the sleep quality, it is recommended to use this model especially in outpatient care settings.

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Introduction

Breast cancer is a major global health concern for women and is recognized as the most prevalent cancer among them. Worldwide statistics show a rising incidence of this disease (1-2). In Iran, not only the statistics show an alarming increase in the incidence of breast cancer cases, but also the affected women are approximately 10 years younger than those in Western countries (3). Biopsy remains the most common and definitive method for diagnosing this cancer. Approximately 1.7 million women in the United States undergo a breast biopsy, with 25% yielding malignant results (4-5). Although most breast biopsy results are benign, most

women do not anticipate a benign result while they are waiting for their biopsy results, which intensifies their psychological pressure (6). The most critical stage in the biopsy process is the waiting period for receiving the results (6-7).

Despite the need for additional rest during the waiting period for biopsy results (8). They report that they have difficulty falling asleep and have nightmares, and the distress related to waiting for biopsy results affects their sleep quality, energy levels, and ability to perform daily tasks (7, 11-12). Blow et al. (2011) reported the waiting period as draining with sleepless and anxiousness (13). However, sleep is an important

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factor in the state of human health, which has long been recognized for a long time. In Maslow's hierarchy of needs, sleep is one of the most basic human needs, which, in addition to maintaining physical and mental health, reduces stress, strengthens the power of adaptation, and focuses on daily activities (14).

On the other hand, despite the importance and necessity of providing support and counseling for this group of clients during this sensitive period, psychological support is not routinely provided. In recent years, there has been a growing concern regarding the psychological effects of diagnostic tests for breast disease symptoms and the distressing waiting period for diagnostic results. Most studies have focused on women's needs and satisfaction with social support after mastectomy, and there is a significant and clear gap in studies on support and counseling during the diagnostic stage of breast cancer. Despite the importance of developing support and counseling programs for this group of clients, unfortunately, the researcher did not find a program for this group, while the need for support and counseling for this group of clients to receive support and counseling has been confirmed in various studies as mentioned.

The results of the study by Liao et al. (2010), which was conducted to investigate the effect of supportive care on anxiety among women suspected of having breast cancer during the diagnosis period, demonstrated the significant effectiveness of this intervention on women's anxiety during this period (15). Based on the researcher's investigation, no study in Iran has addressed the psychological and emotional problems faced by women and their needs during this period, despite the increase in the prevalence of breast cancer and the increasing demand for biopsies. The studies conducted in the world have also expressed the problems and needs of these women during this period.

However, outpatients are also considered a significant population of clients who need to attention and care. Hilgard Peplau's Interpersonal Relations Theory is considered a valuable theory in the discussion of clients' communication and support identifies four sequential phases in the interpersonal relationship: orientation, identification,

exploitation, and resolution. Peplau defined nursing as a therapeutic process with individual importance and emphasized that the relationship between the nurse and the patient is significant, leading to the growth of both. . The goal of nursing in Peplau's theory is to assist others in identifying their emotional problems (16). Peplau's model has been used in various research of nurses and in different patients. The study by Fernandes et al. (2017), which was performed with aim to evaluate the effect of Peplau's model on improvement of participation of type II diabetes patients in self-care program showed the efficacy of Peplau's model on improvement of patients' participation (17).

To the best of our knowledge, the effect of this model on patients waiting for breast biopsy results has not been investigated. Using this model to address the clients' needs for communication and support during this period appear suitable for managing their challenging and complex situation. The purpose of this study was to determine the effect of using the Hilgard Peplau's model on the sleep quality of women during the period of waiting for the results of breast biopsy.

Materials and Methods

This study is a clinical trial with parallel control in which participants were randomly assigned in two groups of intervention and control. The research population consisted of women referred to the two educational hospitals in Mashhad in 2019, who were diagnosed as needing a biopsy by breast clinical examination or imaging. The participants included 68 patients (34 subjects in each group) of women who referred to the department of radiology and breast clinic of hospitals, who needed to undergo a biopsy and met the inclusion criteria.

The inclusion criteria were as follows: suspected breast cancer and having a mass needed to biopsy (diagnosis of physician), age ≥ 18 years, ability to read and write and communicate in Persian, and access to a phone for follow-up. Also, the exclusion criteria were: history of cancer and chronic disease, suffering from mental disease or taking sedatives, antidepressants or anti-anxiety, major stressful events in life (death of first-degree relatives, severe illness of family members, financial bankruptcy, accident, severe family discord with wife) during the past six months.

Since there was no similar study, a pilot study was conducted to calculate the sample size (10 subjects in the intervention group and 10 in the control group), and the sample size of the study was determined using the formula of sample size estimation for comparing the means in two independent communities. To calculate the sample size, we used the mean and standard deviation of the sleep quality score in the intervention group (10.4 ± 3.5) and in the control group (8.9 ± 2.2), which was extracted from a pilot study on 20 subjects. The confidence level of 95% and the power of 80% were considered. Finally, the sample size of 34 subjects in each group (68 in total) was calculated. To gain more confidence and to consider the possibility of dropping out of the sample, 40 subjects were considered for each group, and a total of 80 people were calculated as the sample size. At first, sampling was done by the convenience method and then randomization was carried out by the lottery method (Figure 1). Since the sample were outpatients, the probability of information dissemination was minimal, so the intervention group entered the sampling room after the interview and was discharged from the unit after the end of sampling.

The study tools included the demographic information questionnaire and the Pittsburgh sleep quality scale. The Pittsburgh Sleep Quality Scale is a self-report questionnaire designed by Buysse and colleagues (1988) to measure the quality of sleep and identify people with good sleep (18). This self-report scale includes seven dimensions and nine questions. The questionnaire is scored such that each question is assigned a score from 0 (I have not experienced it at all) to 3 (I have experienced it three or more times a week).

The total score of the questionnaire is obtained by the sum of the scores of seven dimensions of sleep quality and is between 0 and 21, where a score of 0 to 4 indicates good sleep and a score of 5 and above in this questionnaire indicates poor sleep quality. This questionnaire measures the quality of sleep during the last month (18).

After receiving permission from the ethics committee of the university and receiving a letter of introduction from Mashhad School of Nursing and Midwifery with ethics code: IR.MUMS.REC.1397.093 and clinical trial registration code: IRCT-20180618040128N1

and obtaining permission and coordination with the head of the interventional radiology department and the head of the breast clinic, the researcher attended the mentioned units and sampling started.

First, the researcher introduced herself and stated the research objectives, obtained the informed consent of the sample to participate in the research, and the pre-test was taken from the participants who met the inclusion criteria by answering the Petersburg sleep quality questionnaire. Then randomization of the participants into intervention and control groups was done and they were placed in the groups according to the color of the card.

The intervention group received the program designed based on the Peplau's model and the control group received the conventional care. The program designed based on the Peplau's model included one face-to-face communication session and three telephone follow-ups. The face-to-face communication session was done before the sampling by the physician in the breast sampling clinic and in the interventional radiology department and lasted 30 to 40 minutes depending on the client's needs.

In the Peplau's model, communication begins with the familiarization phase. During this phase, the nurse, and the patient get to know each other as strangers and their expectations of each other are determined (16).

In the face-to-face communication session (familiarization phase), the researcher after introducing herself to the client started the session with questions such as "How did you come to be here now?" or "What abnormal finding made you come to the doctor?" The client responded to these questions.

After the client started to explain about how she reached the sampling stage and also explained about her feelings and concerns, the researcher noticed the formation of a sense of security and trust in the client. Then intervention phase started (according to Peplau's model, the intervention phase includes identification and exploitation). The focus of the intervention phase is first, on the patient who, uses resources to improve health, and second, on the nurse, who plays the role of resource, counselor, substitute and teacher in facilitating progress towards well-being (16).

At this stage, the researcher welcomed the client warmly by saying that she would like to hear her concerns and worries and is beside her during this period and continued her conversation with questions like: How did you feel when you were told that you need a breast biopsy? How do the people around you deal with this issue? What are your biggest concerns right now?

In communication with the client, the use of therapeutic communication skills such as acknowledgment and confirmation, admiration, paying attention, reflecting feelings, active listening, empathy, reflection, silence, etc. was helpful.

Considering that most of the clients were constantly worried about the biopsy result and had thoughts including what would happen if I have breast cancer? Thoughts such as surgeries leading to breast removal, the possibility of hair loss, fear of death, long-term and painful illness and uncertainty about the future occupied their minds, the researcher allowed the clients to express their fears and worries. They were reminded that as much as there is a chance of malignancy for them, there is an equal and even more chance of benign and trying to achieve the same goals they had before finding the mass. The researcher asked them to occupy themselves with activities such as exercising, running, shopping, housework, and reading so that they can keep their minds away from the stress of cancer and control their distress.

Then the researcher summarized the conversation and meeting with the client regarding the upcoming procedure and gave her the pamphlets containing breast self-examination, types of biopsy and its complications, biopsy results and follow-up and treatment methods. At the end, she gave her phone number and reminded her that she can call her whenever she needs.

On the first day after sampling, the researcher made a phone call to the clients, and asked about the clients' feelings and concerns and empathized with them. The researcher created a sense of value in the client by stating how useful she has been in her life by playing the role of wife, mother, etc., and gave her hope that 70-80% of the sample results are benign based on the studies conducted. Also, clients were assured

that feelings such as worry, fear, and anger, that she experiences are completely normal.

Before receiving the biopsy result (approximately 5 to 10 days after sampling), the researcher tried to help the client in solving problems and finding life goals by making a second phone call. Therefore, she asked the client about her goals. At the end, she asked about her questions and doubts and reminded her that the next phone call after receiving the result would be their last communication. In addition, the client was asked to complete the relevant questionnaires.

After receiving the results and hearing the results of the biopsy from the physician, the researcher contacted the patient and thus they were formed the liquidation phase (according to the Peplau's model, the liquidation phase is a movement towards the termination of the relationship between the nurse and the patient, in which old goals are set aside and new goals are accepted) (16)). The researcher asked the client about the result and recommendations given by the doctor, and if the biopsy result was benign, she gave the relevant recommendations to the client regarding the necessary follow-up. If the result was malignant, she hoped that with timely follow-up, this malignancy would be one of the most treatable malignancies, and then discussed the treatment method proposed by the doctor and provided training related to the treatment methods including mastectomy, radiation therapy or chemotherapy and solved the questions and doubts of the client.

At the end, she was asked to complete the relevant questionnaires again two weeks later. In this study, the control group received conventional care, which included a brief explanation of the biopsy procedure. The research questionnaires in this group were placed in a folder on which the time of completion was written (before receiving the result and two weeks later) and they were reminded by SMS to complete the questionnaire. In addition, after the completion of the intervention, the researcher contacted the control group and, if they wished, the intervention was conducted for them in the form of a telephone counseling session and also provided them with related pamphlets.

After collecting and coding data, SPSS software (version 16) was used for data analysis. At first, the normal distribution of the quantitative variables was measured through Kolmogrov-Smirnov and Shapiro-Wilk tests and considering a significance level of 5%. Independent t-test was used to compare two groups in terms of homogeneity regarding normal quantitative

variables and Mann-Whitney test was used for non-normal quantitative variables and rank variables. Nominal variables were also compared in the two groups using the chi-square test, exact chi-square test, and Fisher's exact test. Also, analysis of variance with repeated measures and Bonferroni's post hoc tests were used for intergroup and intragroup tests.

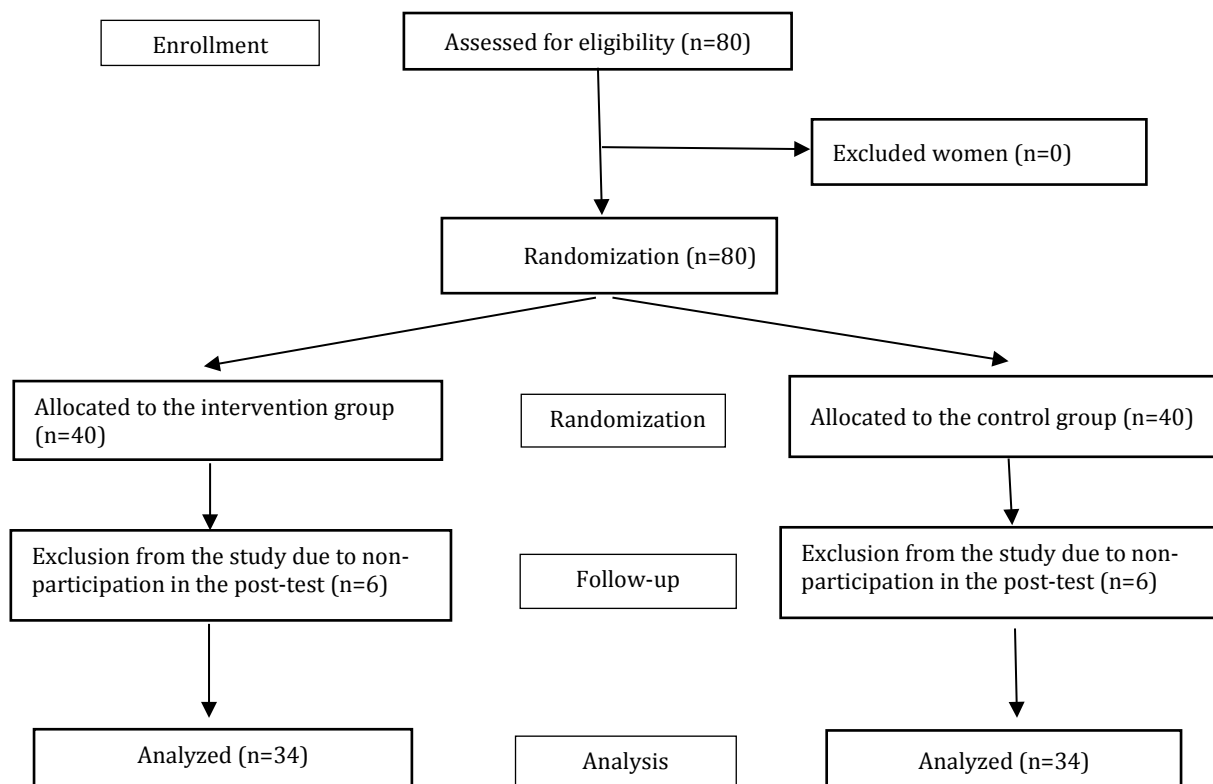


Figure 1. CONSORT Flow Chart of Patients' Selection

Results

The mean age of the women waiting for the biopsy result was 38.2 ± 10.2 years in the intervention group and 38.3 ± 10.3 years in the control group. The independent t-test did not show significant difference in this regard ($P = 0.962$) and the two groups were homogeneous. Most of the women in the intervention and control groups were married, had two children, and had education of primary school (Table 1).

In line with the research objective of "determining the effect of Hilgard-Peplau's

model implementation on women's sleep quality during the period of waiting for breast biopsy results", the results of this study showed. Before sampling, the mean of the sleep quality of the women waiting for the biopsy results was 9.1 ± 3.2 in the intervention group and 8.4 ± 2.6 in the control group. Independent t-test did not show a significant difference in this regard ($P=0.383$). Before receiving the biopsy results, the mean of sleep quality of women waiting for the biopsy

Table 1. Demographic characteristics of women waiting for the result of breast biopsy

Demographic variable	Intervention	Control	P-value
Mean age	38.2±10.2	38.3±10.3	* 0.96
Marital status	N (%)	N (%)	
Single	2 (5.9%)	2 (5.9%)	
Married	32 (94.1%)	31(91.2%)	*** 1.0
Widow	0 (0.0%)	1 (2.9%)	
Number of children	N (%)	N (%)	
No children	2 (6.3%)	4 (12.5%)	
One child	6 (18.8%)	8 (25.0%)	
Two children	10 (31.3%)	8 (25.0%)	** 0.49
Three children	7 (21.9)	4 (12.5%)	
Four children and more	7 (21.9%)	8 (25.0%)	
Place of living	N (%)	N (%)	
Urban	29 (85.3%)	30 (88.2%)	*****1.0
Rural	5 (14.7%)	4 (11.8%)	
Home ownership	N (%)	N (%)	
Personal	20 (58.8%)	22 (64.7%)	
Rent or mortgage	14 (41.2%)	12 (35.3%)	***0.61
Economic situation	N (%)	N (%)	
Less than enough	8 (23.5%)	8 (23.5%)	
Enough	26 (76.5%)	26 (76.5%)	
Elementary	17 (50%)	8 (23.5%)	*** 1.0
Intermediate	6 (18.6%)	13 (38.2%)	
Educational level	N (%)	N (%)	
High school	10 (29.4%)	11 (32.4%)	
University	1 (2.9%)	2 (5.9%)	
Housewife	30 (88.2%)	30 (88.2%)	
Employee	2 (5.9%)	1 (2.9%)	**0.1
Worker	0 (0.0%)	1 (2.9%)	
Occupational status	N (%)	N (%)	
Student	1 (2.9%)	1 (2.9%)	
Unemployed	0 (0.0%)	1 (2.9%)	
Retired	1 (2.9%)	0 (0.0%)	*** 1.0
Living status	N (%)	N (%)	
Alone	0(0.0%)	1 (2.9%)	
With parent's	2 (5.9%)	2(5.9%)	
With husband	2 (5.9%)	5 (14.7%)	*** 0.61
With husband and children	28 (82.4%)	25 (73.5%)	
With children	2 (5.9%)	1 (2.9%)	
Insurance status	N (%)	N (%)	
Social Security	13 (38.2%)	10 (29.4%)	
Health Service	2 (5.9%)	2 (5.9%)	
Free	0 (0.0%)	1 (2.9%)	***0.84
Screening records	N (%)	N (%)	
Yes	9 (26.5%)	5 (14.7%)	*** 0.23
No	25 (73.5%)	29 (85.3%)	

	N (%)	N (%)	
Experience caring For a cancer patient			
Yes	7 (20.6%)	2 (5.9%)	
No	27 (79.4%)	32 (94.1%)	
History of benign Breast biopsy			
Yes	7 (20.6%)	6 (17.6%)	**** 0.15
No		28 (82.4%)	
A family history of breast cancer			
Yes	7 (20.6%)	3 (8.8%)	***0.75
No	27 (79.4%)	31 (91.2%)	
Formal training Related to breast biopsy			
Yes	7 (20.6%)	2 (5.9%)	*** 0.1
No	27 (79.4%)	32 (94.1%)	

*Independent t-test; **Mann-Whitney U test; *** Chi-square test; ****Fisher's exact test

results was 8.2 ± 0.3 in the intervention group and 8.3 ± 2.4 in the control group. Two weeks after receiving the results, the mean of sleep quality of the women waiting for biopsy was 7.4 ± 2.7 in the intervention group and 7.6 ± 2.8 in the control group. In the inter-group comparison, the analysis of variance test with repeated measures showed that there was a statistically significant difference between the two groups in terms of sleep quality according to the measurement stage ($P=0.01$). In the intragroup comparison, the analysis of variance test with repeated measures showed no Significant difference in sleep quality of the control group at different measurement stages ($P=0.342$), but in the intervention group, there was a statistically significant difference in sleep quality according to the measurement stage ($P=0.001$). Bonferroni's post hoc test showed

significant difference between two weeks after sampling and before sampling ($P=0.011$) (Table 2).

Also, before receiving the results compared to before sampling, sleep quality decreased by 0.9 ± 2.2 in the intervention group and 0.2 ± 2.2 in the control group. Two weeks after receiving the results compared to before sampling, sleep quality decreased by 1.6 ± 2.4 in the intervention group and 0.8 ± 2.4 in the control group. Two weeks after receiving the results compared to before receiving the results, sleep quality decreased by 0.8 ± 2.1 in the intervention group and 0.6 ± 2.3 in the control group. The score of sleep quality has decreased in the stages of inter-group comparison. Since a decrease in the score in this tool is a sign of improvement, therefore, the intervention in the present study has helped to improve the quality of sleep.

Table 2. Mean of sleep quality in women waiting for biopsy results in different time periods in the intervention and control groups

Sleep quality	Group		Intergroup test result
	intervention (N=34) Mean±SD	Control (N=34) Mean±SD	
Before sampling	9.1 ±3.2	8.4 ± 2.6	P=0.383 Independent T test
Before receiving the results	8.2± 3.0	8.3 ±2.4	
Two weeks after receiving the results	7.4 ± 2.7	7.6 ±3.8	
	F=12.66. df=2 P=0.001 Analysis of variance with repeated measures (intra group)	F=3.65 df=2 P=0.342 Analysis of variance with repeated measures (intra group)	Changes process at three times F=13.4 P=0.01 Analysis of variance with repeated measures (intergroup)

Discussion

The results of the present study showed that the implementation of the Hilgard Peplau's model had a statistically significant effect on the sleep quality of women during the period of waiting for the results of breast biopsy. Also, the score of sleep quality before receiving the results compared to before sampling, two weeks after receiving the results compared to before sampling, and two weeks after receiving the results compared to before receiving the results significantly decreased in the intervention group than the control. Although the reduction of the sleep quality score over time is also observed in the control group, and this shows that with the passage of time, the clients' compliance with conditions was better and the overall sleep quality have improved in both groups. But this reduction rate was more significant in the intervention group compared to the control group.

According to the available national and international databases, the researcher could not access a similar study that investigated the effect of the Hilgard Peplau's model on women's sleep quality during the period of waiting for the results of breast biopsy, so she used the closest available studies for discussion.

In the study by Alishahi et al. (2015), the implementation of Peplau's theory of interpersonal relations reduced the stress of patients undergoing hemodialysis (20). Also, the

results of the study by Parsamehr et al. which investigated the effect of the Peplau's model on anxiety and depression of candidates for coronary artery bypass surgery indicated that the use of the Peplau's model is useful and effective in reducing psychological complications after discharge (21). As the results of these studies show, the use of effective communication skills as one of the important nursing tools to support patients is preventing misinterpretation of information and creating a sense of value and respect in patients, which were common components of these research and the present study.

The reasons for the effectiveness of the intervention can be establishing effective communication and empathy with the client, active listening, and providing information, reassuring the client, training coping mechanisms, and feeling of support for the client through telephone access to the researcher.

The results of Manzari et al.'s study (2005), investigated the impact of a therapeutic communication program designed based on Hilgard Peplau's theory on the participation of burn patients in care and treatment programs, demonstrated a positive effect of nurse-patient communication utilizing Peplau's model. This positively influenced the process of patient participation in care and treatment programs and, consequently, their clinical outcomes (22). As can be seen from the results of the above

research, therapeutic communication based on the Peplau's model had a positive effect on burn patients to improve their participation in care and treatment programs; however the present study showed its effect on outpatients. Because the clients performed the training in practice to reduce stress and improve sleep. The reasons for this alignment are the correct and principled application of Peplau's model and the use of supportive and counseling nursing roles in practice.

The results of Erci et al.'s study (2004), which investigated the effectiveness of Peplau's interpersonal communication model on the anxiety of patients before and after surgery, showed the positive effect of using Peplau's therapeutic communication model in reducing the anxiety of these patients before and after surgery. Also, communicating and providing information to patients increases their self-confidence in dealing with issues related to their health and improves their hope and optimism (23). Arabacı and colleagues (2019) conducted a study titled "The effect of using Peplau's Interpersonal Relations Model in the care of a delinquent teenager to determine the role of therapeutic interaction and communication in the care of delinquent teenagers using Peplau's theory. They indicated the effectiveness of communication therapy using Peplau's model on increasing commitment to the life and hope for the future (24). Therefore, according to the results of the present study and other studies, this model can be used to improve the quality of care provided to this category of patients.

This study had some limitations. Conducting the study during the COVID-19 epidemic has been effective on the sleep quality of women in the two groups. In addition, it should be mentioned that the Pittsburgh Sleep Quality Questionnaire measured the sleep quality of the clients during the previous month, which was not considered a suitable tool for the present study; however it is frequently used in many studies. Also, the impossibility of blinding the intervention and control groups, and selecting sample from the clients of educational and government hospitals may limit the generalization of the results. Additionally, individual differences and the psychological status of the participants when

answering the sleep questionnaire are among the limitations of the present study.

Conclusion

The results of the present study indicate that the use of the Hildegard Peplau's model can effectively enhance the sleep quality of women during the waiting period for the results of a breast biopsy. Recognizing the importance of providing comfort and addressing the psychological and emotional challenges faced by outpatients, members of the clinical and treatment team can consider incorporating a program designed based on the Peplau's model. Such planning may contribute to improving sleep quality and mitigating psychological and emotional complications among women awaiting the results of a breast biopsy

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Conflicts of interest

The authors declared no conflicts of interest.

References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2019. *A Cancer Journal for Clinicians*. 2019; 69(1): 7-34.
2. Momenimovahed Z, Salehiniya H. Epidemiological characteristics of and risk factors for breast cancer in the world. *Targets and Therapy*. 2019; 11(2019): 151-164.
3. Montazeri A, Vahdaninia M, Harirchi I, Harirchi AM, Sajadian A, Khaleghi F, et al. Breast cancer in Iran: need for greater women awareness of warning signs and effective screening methods. *Asia Pacific Family Medicine*. 2008; 7(1): 1-7.
4. Kutay E, Milch H, Sayre J, Joines M, Hoyt A, Li B, Chan TL. Fear of the unknown: the benefits of a patient educational handout on breast biopsy markers. *Journal of Breast Imaging*. 2022; 4(3): 285-290.
5. Miller SJ, Sohl SJ, Schnur JB, Margolies L, Bolno J, Szabo J, et al. Pre-biopsy psychological factors predict patient

- biopsy experience. *International Journal of Behavioral Medicine*. 2014; 21(1): 144-148.
6. Sweeny K, Christianson D, McNeill J. The Psychological Experience of Awaiting Breast Diagnosis. *Annals of Behavioral Medicine*. 2018; 53(7): 630-641.
 7. Morse JM, Pooler C, Vann-Ward T, Maddox LJ, Olausson JM, Roche-Dean M, et al. Awaiting diagnosis of breast cancer: strategies of enduring for preserving self. *Oncology Nursing Forum*. 2014; 41(4): 350-359.
 8. Bolvin J, Lancaster D. Medical waiting periods: imminence, emotions and coping. *Women's Health*. 2010; 6(1): 59-69.
 9. Wilson, M., Rankin, K., Ludi, D, Sweeny, K. Emotional, cognitive, and physical well-being during the wait for breast biopsy results. *Psychology & Health*. 2022; 25: 1-20.
 10. Sweeny, K. Medina, J. Links between well-being and sleep while awaiting breast biopsy results. *Stress and Health*. 2023; 39(2): 299-308.
 11. Drageset S, Lindstrøm TC, Giske T, Underlid K. Being in suspense: women's experiences awaiting breast cancer surgery. *Journal of Advanced Nursing*. 2011; 67(9): 1941-1951.
 12. Sweeny K, Falkenstein A. Is waiting the hardest part? Comparing the emotional experiences of awaiting and receiving bad news. *Personality and Social Psychology Bulletin*. 2015; 41(11): 1551-1559.
 13. Blow AJ, Swiecicki P, Haan P, Osuch JR, Symonds LL, Smith SS, et al. The emotional journey of women experiencing a breast abnormality. *Qualitative Health Research*. 2011; 21(10): 1316-1334.
 14. Borzou S, Khavari F. The Effects of Sleep Hygiene Education on Fatigue and Sleep Quality in Hemodialysis Patients: A Quasi Experimental Study. *Avicenna Journal of Nursing and Midwifery Care*. 2019; 27(1): 25-34.
 15. Liao MN, Chen PL, Chen MF, Chen SC. Effect of supportive care on the anxiety of women with suspected breast cancer. *Journal of Advanced Nursing*. 2010; 66(1): 49-59.
 16. Peplau HE. Interpersonal relations: A theoretical framework for application in nursing practice. *Nursing Science Quarterly*. 1992; 5(1): 13-18.
 17. Fernandes S, Naidu S. Promoting Participation in Self Care Management among Patients with Diabetes Mellitus: An Application of Peplau's Theory of Interpersonal Relationships. *International Journal of Nursing Education*. 2017; 9(4): 129-134.
 18. Fatima Y, Doi S, Mamun A. Sleep quality and obesity in young subjects: a meta-analysis. *Obesity Reviews*. 2016; 17(11): 1154-1166.
 19. Moghaddam JF, Nakhaee N, Sheibani V, Garrusi B, Amirkafe A. Reliability and validity of the Persian version of the Pittsburgh Sleep Quality Index (PSQI-P). *Sleep and Breathing*. 2012; 16(1): 79-82.
 20. Alishahi B, Hemmati Maslak Pak M, Sheikh S, Moradi Y. Effects of peplau's theory of interpersonal relations on stress of hemodialysis patients. *Nursing and Midwifery Journal*. 2017; 15(1): 1-9.
 21. Parsamehr M, Afshani A, Nikoo F. Relationship between Anxiety and Depression with Quality of Life after Coronary Artery Bypass Graft. *Iran Journal of Nursing*. 2015; 28(93): 106-117.
 22. Manzari Z, Meamarian R, Vanaki Z. Effectiveness of Therapeutic Communication program based on Hilgard Peplau theory on Burned Patient's participation in caring and curing plans. *Journal of Ethics and Culture in Nursing and Midwifery*. 2013; 1(1): 35-46.
 23. Erci B, Sezgin S, Kaçmaz Z. The impact of therapeutic relationship on preoperative and postoperative patient anxiety. *Australian Journal of Advanced Nursing*. 2008; 26(1): 59.
 24. Arabacı LB, Taş G. Effect of Using Peplau's Interpersonal Relation Nursing Model in the care of a juvenile delinquent. *Journal of Psychiatric Nursing*. 2019; 10(3): 218-226.