

The Effect of Betty Neuman System Model on the Anxiety of Mothers of Children Admitted to the Surgical Ward

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Introduction: The children's illness and admission to hospital is considered a crisis and a source of anxiety for their mothers. Betty Neuman system model, as one of the most practical nursing models, is based on human relationship, understanding of stress and increasing adaptation support, and also plays an important role in increasing the quality of clinical care. Therefore, this study was conducted to examine the effects of Betty Neuman system model on the anxiety of mothers of children admitted to the surgical ward.

Methods: This experimental study was performed on 60 mothers of children admitted to the surgical ward. The samples selected by simple random sampling and divided in two intervention and control groups. The data collection tools included a demographic information form and the Spielberger Anxiety Inventory. The intervention group received 4 sessions (30-45 minutes) of training based on Betty Neuman model, and the control group only received the routine training. Data were analyzed by SPSS-23 statistical software using descriptive statistics (table, mean and standard deviation) and inferential statistics (paired t-test, independent t-test and ANCOVA).

Results: The results of ANCOVA test showed a significant difference in the anxiety score of mothers ($P < 0.01$ and $\text{Eta} = 0.54$) between the two groups by removing the effect of pretest ($P < 0.01$ and $\text{Eta} = 0.54$), so that 54% of the changes in anxiety reduction were due to the effect of Neuman system model-based training.

Conclusion: Considering the effectiveness of Betty Neuman model on reducing the anxiety of mothers of hospitalized children, it can be argued that by using nursing theories and models, we can improve the patient care standards, increase patient satisfaction and quality of care, and reduce the treatment costs.

Keywords: Betty Neuman model, anxiety, mothers, hospitalized children

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Introduction

Surgery is a common approach in children treatment around the world (1). About 5 million children are hospitalized each year in the United States for diagnosis and treatment (2). Usually, the crisis caused by children hospitalization affects all family members (3). Paying attention to the stress and mental health of the child and family is very important and necessary (4,5). This fear and anxiety remain with the parents not only at the time of hospitalization, but also after surgery and even discharge (3, 6), because surgery is considered a stressful event for parents of hospitalized children. Most of this anxiety is due to the parents' lack of knowledge about the surgery, the outcomes of surgery and the costs of surgery (1, 7). Children hospitalization sometimes causes a sense of guilt, sadness, anger and confusion in parents (2). The occurrence of psychological problems in mothers, especially anxiety, aggravates emotional problems in children even after their discharge from hospital (4, 8, 31). Paying attention to stress and physical and mental health of children and families is very important and necessary (4, 5, 28). Today, with the increase in pediatric surgeries and the transfer of caring roles to parents, parental participation and education in nursing care is more prominent (1).

Teaching the caring roles reduces stress in parents (9, 10) Therefore, the role of nurses in educating mothers is important and necessary (6). The use of nursing models in the physical and psychological adaptation of patients has an important role in improving the quality of medical care (11). Implementation of medical care based on nursing theories leads to the effectiveness of medical care and reduction of medical costs (12, 13). One of the widely used nursing theories is the Betty Neuman system model (14). This model is a comprehensive and client-centered model which by emphasizing on the understanding of environment and surrounding factors such as physiological, psychological, cultural, social and spiritual conditions, promotes the health of patients and their caregivers (15). Surgery may be associated with pain, so assessing pain in Evaluation of pain in different patients, especially infants is important. (16). Neuman model as an open model has an important role in strengthening the body's defense and reducing stress (18). Studies have shown that the use of Betty Neuman model has an important role in promoting education, management, research and nursing care (19). But unfortunately, nursing models and theories have been sufficiently used in nursing studies. There are also limited studies on the Neuman model. Therefore, the researcher in this study decided to conduct a study to investigate the effects of Betty Neuman system model on the anxiety of mothers of children admitted to surgical ward.

Method

This experimental study was conducted in 2020 on the mothers of children admitted to the surgical ward of Mousavi Hospital in Gorgan, Iran. Criteria for entering the study included children aged 3-10 years with a diagnosis of surgery who have been hospitalized for at least 4 days, and not having genetic diseases such as hemophilia, thalassemia and mental retardation. Exclusion criteria included the mothers who have been absent from training for more than one session. Sample size of this study was calculated to be 60 people (n=30 in each group) by G* Power statistical software based on the Enadi et al. (2015) study with an effect size of 0.76, test power of 80% and significance level of 0.05. The sampling was done by simplifying random method. Data collection tools in this study included a demographic information form (mother's age, child's age, mother's education, mother's occupation, child's gender and length of hospital stay) and the State-Trait Anxiety Inventory (STAI), which was developed in 1970 by Spielberger. This questionnaire contains of 40 items in 4-point Likert scale ranging from almost never (score 1), sometimes (score 2), most of the time (score 3) and almost always (score 4), which shows the degree of anxiety. The score of this questionnaire ranges from 40 to 160, with higher score indicating higher level of anxiety (8).

The content and face validity of this questionnaire was confirmed by 10 faculty members and professors of Islamic Azad University, Aliabad Kotoul Branch, and its reliability was confirmed in Heshmatifar (2019) study with Cronbach's alpha coefficient of 0.90 (21).

After approving the project by the University's Research Council and obtaining the code of bioethics with the number: IR.IAU.CHALUS.REC.1399.020, the researcher introduced himself to the samples and ensured them about the safety, objectives and process of the study. The participants were also ensured about maintaining the principles of anonymity and confidentiality in this study and also were informed that, they can leave the study at any time without any consequences. Data were collected before the intervention by self-reporting method using an anxiety questionnaire. In the control group, the mothers received routine training before and after the operation according to the hospital's rules and regulations. However, in the intervention group, in addition to the routine training provided by the hospital, the researcher held three (30-45 minutes long) training sessions based on the Betty Neuman system model and prevention levels (Table 1). Then, the collected data were entered into SPSS-21 software for analysis using descriptive statistics (table, mean and standard deviation) and inferential statistics (paired t-test, independent t-test and ANCOVA test) at a significant level of 0.05.

Box 1: Implementation of Neuman model for the anxiety of mothers of children admitted to surgical ward

Variable	Nursing diagnosis	Nursing objective	Prevention level	Nursing intervention	Nursing outcome
Physiology	Sleep disturbance	Eliminate insomnia and rest	Second level	Create a calm environment / adjust the room temperature	The mother slept for 6 hours
Psychological	Maternal anxiety regarding child hospitalization	Reduce maternal anxiety level	Second level	Encourage the expression of emotions - Answer the questions - Presence of mother by her child	The mother calmly appeared by her child
	Ineffective individual coping	Be able to cope with stress	Second level	Strengthen support systems, Strengthen the capabilities of mother	Be able to control stress within a week
	Feeling guilty about the child hospitalization	Eliminate the sense of guilt in the mother	Second level	Encourage expression of emotions, Strengthen interpersonal relationships	The mother seeks to increase the quality of care for the child
	Feeling frustrated with the child's illness	The mother becomes self-confident about her future	Second level Third level	Strengthening self-esteem in the mother / showing similar cases / continuity of mother-nurse relationship after discharge	The mother was discharged with the hope that her child would not be readmitted
	Lack of knowledge	Increase awareness of the disease	First and second levels	Familiarity of mother with the nurse and ward – Discovering the feelings, anxiety and knowledge	The mother acquired the necessary information about the disease

Developmental	Mother's age was 17 years	Increase awareness in the mother	First and second levels	Strengthen support systems / increase awareness of the mother	The mother gained the necessary information about her maternal roles
Psychosocial	Isolation and reduction of interactions	Establish social relationships	Second and third levels	Strengthen self-esteem - Identify previous interactions - Strengthen support systems	The mother warmly welcomed her friends and relatives during the visiting hours
Spiritual	Spiritual turmoil in relation to stress caused by the child condition	Creating spiritual cohesion	Second and third levels	Discovering spiritual needs - Strengthening spiritual beliefs - Accelerating the fulfillment of spiritual duties	The mother reads the Qur'an and prays in the ward – The mother makes promise to help poor child after the discharge

Results

In terms of demographic characteristics, the mean age of mothers of hospitalized children in the intervention group was 29.93 ± 5.9 years and in the control, group was 28.41 ± 28.37 years, and independent t-test did not show a significant difference between the two groups in this regard ($p = 0.25$). The mean age of hospitalized children in the intervention group was 4.16 ± 1.28 years and in the control group was 3.27 ± 1.96 years, and independent t-test did not show a significant difference between the two groups in this regard ($P = 0.54$). Duration of hospital stay in the intervention group was 6.76 ± 2.6 days and in the control group was 6.36 ± 1.29 days, and independent t-test did not show a significant difference between the two groups in this regard ($P = 0.51$). Also, Chi-square did not show a significant difference between the intervention and control groups in terms of education ($P = 0.33$) and occupation ($P = 0.68$).

The independent t-test showed no significant difference between the two groups before the intervention in terms of the anxiety level ($P = 0.51$), but it showed a significant difference between the two groups after the intervention ($P < 0.01$). Paired t-test also showed a significant difference in the anxiety level of the intervention group before and after the intervention ($P = 0.007$), but did not showed a significant difference in the control group ($P = 0.15$), (Table 1).

The ANCOVA test showed a significant difference between the two groups by removing the effect of pre-test ($P < 0.01$ and $\text{Eta} = 0.54$), so that 54% of changes in anxiety reduction could be caused by the training (Table 2).

Table 1: Comparison of the anxiety level in the mothers of children admitted to the surgical ward between the intervention and control groups before and after the intervention

Group Time	Control	Intervention	P-value
Before the intervention	114.97 ± 17.3	111.87 ± 19.49	$P = 0.51$
After the intervention	116.93 ± 14.9	103.47 ± 12.1	$P < 0.01$
P-value	Mean=-1.9, $p=0.15$	Mean=8.4, $p=0.007$	

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Table2: Effect of Neuman model on the anxiety of mothers of children admitted to surgical ward

	Sum of square roots	Degree of freedom	Mean of square roots	F-value	Significant level	Eta
Modified model	7769.66	2	3884.91	54.95	P<0.01	0.64
Pretest separator	5049.71	1	5049.71	71.43	P<0.01	0.54
Group	2104.75	1	2104.75	29.77	P<0.01	0.34
Error	40296	57	70.69			
Sum	74044	60				
Total	66.11799	59				

Discussion

The results of this study showed that, the Betty Neuman system model reduced the anxiety of mothers of children admitted to the surgical ward. The results of this study are consistent with other studies. Diagnosis and treatment of the disease is very important in advancing treatment and plays a helpful role in this regard (22, 29). Sengun (2016) argued that Neuman model plays an important role in reducing stress and increasing the quality of nursing care (23). Basgu (2020) stated that Betty Neuman system model reduces depression and stress, increases self-esteem and problem-solving skills, and improves coping strategies in patients (18). Betty Neuman system model is a holistic and client-centered model that emphasizes on human relationships, needs assessment and elimination of stress and anxiety (14). Betty Neuman model is a community-centered model based on three pillars of first, second and third levels of prevention, which in patients with predicting risk factors admitted to ICU, reduces the incidence of delirium or in the face of aging, causes adaptation to old age and chronic diseases (24, 25).

According to the results of studies, it can be argued that Betty Neuman system model is a low-cost efficient and effective intervention in reducing patients' stress and anxiety, which can be used as an effective clinical guide in health care (14, 26). As mentioned before, mothers' education plays an important role in reducing anxiety and concern (1). Bazar Afshan et al. (2020) believed that education and counseling play an important role in psychological well-being, reducing stress and increasing adaptation in mothers of hospitalized children (12). Nursing care such as educating mothers of hospitalized children in addition to increasing self-efficacy reduces maternal anxiety (8). Therefore, the supportive and educational programs, especially for mothers, have an effective role in reducing their anxiety (4).

Finally, it can be concluded that the use of nursing models and theories in clinical care is increasing (15). Results of this study showed that the use of nursing models has an important role in improving the quality of nursing care (27). Therefore, nursing models such as the Betty Neuman system model can be used as a guide in clinical care.

One of the limitations of this research was the cultural and financial differences between the research units. To compensate for that, the researcher tried to implement the training in accordance with the level of samples' understanding, literacy and culture.

Conclusion

Considering the effectiveness of Betty Neuman system model in reducing the anxiety of mothers of children admitted to the surgical ward, it can be said that the use of nursing theories and models has an important role in increasing the awareness and empowerment of patients and their caregivers. Parental education and awareness, along with understanding and supporting their emotional needs, would increase therapeutic motivation and promote self-care in patients and their caregivers. Therefore, it can be concluded that the use of nursing theories and models in addition to reducing treatment costs, leads to satisfaction with the care provided.

Acknowledgments

The authors of this study would like to thank the staff of Mousavi Hospital in Gorgan for their help and support. This project has been approved by the Research Council of Islamic Azad University, Aliabad Kotoul Branch, with the ethics code: IR.IAU.CHALUS.REC.1399.020.

Conflict of interest

No conflict of interest was observed in this study.

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