

The Effect of Betty Newman System Model on Anxiety of Patients Undergoing Endoscopy at Torbat Heydariyeh 9th Day Hospital

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Abstract

Background and aim: Endoscopy is one of the most stressful interventions for patients. High levels of anxiety in patients have adverse effects on them. The Betty Newman system model, as one of the most common nursing models, reduces patient stress. This model plays an important role in reducing patient anxiety by predicting and identifying potential and actual stresses. Thus, the aim of this study was to evaluate the effect of Betty Newman system model on anxiety of patients undergoing endoscopy.

Materials and methods: This classic experimental study was conducted in January 30, 2018 on 60 patients undergoing endoscopy at the clinic of Torbat Heydariyeh 9th Day Hospital. Simple random sampling method was used to divide the selected samples into two groups of intervention and control. The data collection tool was the State-Trait Anxiety Inventory (STAI). Routine nursing care was delivered to samples in the control group, but in the intervention group, intervention was implemented in two sessions (15 minutes to 20 minutes) based on the Betty Newman system model. Data were analysed by SPSS-21 statistical software using descriptive (table, mean, standard deviation) and inferential statistics (paired sample t-test, independent samples t-test, ANCOVA).

Results: Independent t-test did not show a significant difference between the intervention and control groups before the intervention in terms of anxiety level ($P=0.58$), but it showed a significant difference between the two groups after the intervention ($P<0.01$). Also, ANCOVA test showed a significant difference between the two groups by removing the effect of pretest ($P<0.01$, $\eta^2=23\%$).

Conclusion: Considering the results of this study and the effectiveness of Betty Newman system model on reducing patients' anxiety, it is necessary to use this model and other effective nursing theories as a guide in nursing interventions.

Keywords: Anxiety • Endoscopy • Betty newman system model

Introduction

Endoscopy, as an intervention that identifies the disease before its onset, is effective in increasing survival and reducing the cost of treatment, but it is associated with complications [1]. The most important endoscopic complication is anxiety [2]. This stressful experience is accompanied by many emotional and psychological reactions [3]. Increased anxiety is associated with depression and secondary complications after endoscopy [4]. Often, hospital environment and device noises are important factors in aggravating anxiety and psychological reactions [5]. Anxiety is one of the most common disorders during hospitalization or treatment procedures in the hospital [6]. Patients undergoing endoscopy usually experience a wide range of negative emotions such as anxiety, anger, and depression [7]. The high level of anxiety during invasive procedures such as endoscopy, in addition to causing complications, leads to inversions, prolongs the

procedure time, requires the use of strong sedatives, and makes patient's recovery more difficult [2,8]. Anxiety stimulates the sympathetic system, leading to increased heart rate and blood pressure, as well as adverse effects [9]. Since the use of pharmacological methods to reduce anxiety is associated with cardiovascular complications in patients [10], non-pharmacological methods are suitable substitutes that can be used to reduce anxiety and complications [11].

Nurses, as the main and important member of treatment team, have an important role in reducing patient anxiety [8]. The use of short-term nursing education programs also have an important role in reducing patient anxiety [12]. Studies show that educational programs based on theory-based approaches have an important role in changing behaviours [13]. Among these widely used theories of nursing is the Betty Newman system model [14]. This model is a comprehensive, complete and practical model [15], in which the role of nurses is to predict stressors and factors affecting stress,

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Received date: 16 December, 2021; **Accepted date:** 30 December, 2021; **Published date:** 06 January, 2022

as well as support patient [16]. Newman model as an open model plays an important role in strengthening body's defence lines and reducing stress [17]. Studies have shown that use of Betty Newman model has an important role in promoting education, management, research and nursing care [18,19]. However, considering the importance of nursing theories, very few nursing models and theories have been used in nursing care. Therefore, this study was performed to investigate the effect of Betty Newman system model on anxiety of patients undergoing endoscopy.

Methods

This is a classic experimental study with two intervention and control groups. The study population consisted of patients undergoing upper gastrointestinal endoscopy at medical clinic of Torbat Heydariyeh 9th Day Hospital in 2018. The sample size of this study was calculated to be 60 people (n=30 in each group), using G* Power statistical software and study of Enadi, et al. with an effect size of 0.76 and 80% test power at a significance level of 0.05 [20]. Sampling was performed by convenience method and then, the participants were divided in two intervention and control groups by simple random allocation method. First, people who were eligible to participate in the study were selected and then, they were divided into two intervention and control groups by lottery method. Inclusion criteria in this study were; being alert and aware of the time and place, being able to communicate verbally and visually, being 18-70 years old, being in the medical ward at least 1 day before endoscopy, and being fluent in Persian. Exclusion criteria were; unwilling to continue with the study, and not attending the training session.

Data collection tools included a demographic information questionnaire (age, education, occupation, income, gender, marriage) and Spielberger State-Trait Anxiety Inventory (STAI), which were used to measure the level of anxiety. The STAI was designed by Spielberger in 1970 and in 1983 it was reviewed, amended and finalized [18]. This tool contains 40 questions that are based on the 4-point Likert scale (never, sometimes, so often, all the times). In this tool, questions related to trait anxiety, which is a long-standing personality trait, intent to measure the constant individual differences in readiness to become anxious. These questions are also based on Likert scale (never, sometimes, so often, all the times). Questions 1- 2- 5- 8- 10- 11- 15- 16- 19- 20- 21- 23- 26- 27- 30- 33- 34- 36 and 39 indicate the absence of anxiety and are scored inversely. In this tool, after obtaining the total score, anxiety level is divided into three levels of mild anxiety (20 to 29), relatively mild anxiety (30 to 49), relatively severe anxiety (50 to 69), and severe anxiety (70 to 80). The validity of this tool was confirmed by ten faculty members of the University of Medical Sciences and the Islamic Azad University [3]. This tool has also been used in many studies to measure anxiety. The reliability of this inventory was confirmed in the study of Taghavi, et al. with Cronbach's alpha coefficient of 92% for the state anxiety scale and 90% for the trait anxiety scale [21].

This study was approved by the Ethics Committee of Torbate Heydariyeh Univeristy of Medical Sciences with the code: IR.THUMS.REC.1397.029, and clinical trial code: IRCT20181009041282N4. After obtaining the necessary permissions, the researcher introduced himself to the officials of the hospital and the endoscopy center, while explaining the study objectives

and emphasizing on the safety of the study. The researcher also explained the objectives and method of study to the participants and assured them about their personal information, which would remain confidential and anonymous. The participants were also informed that they can withdraw from the study at any time without any consequences. Samples in the control group received the endoscopic routine care, but those in the intervention group received intervention based on the Betty Newman system model in 2 sessions (15 minutes to 30 minutes log) as follow:

At first, the researcher examined the samples' individual factors and their level of understanding before performing the intervention. Then, he determined their level of stress and identified the factors affecting their stress.

In the evaluation phase of Newman's theory, first potential/actual stresses and appropriate goals and strategies for actions were determined, and then natural and flexible defensive lines were strengthened. So, at first, the level of patients' anxiety was measured in the intervention group and then, the potential and actual stressors were examined. At the stage of identifying appropriate goals and strategies for the actions, if no reaction was determined, the interventions were performed in the first level of prevention, in which the penetration of stressors into the natural defensive line was prevented and the severity of reaction was reduced by decreasing the likelihood of counter with the stressors and strengthening the defensive line. At the second level of prevention, the natural and flexible defensive lines, which had been compromised, were restored. The intervention was aimed at strengthening the internal defensive lines in order to reduce reaction to stressors. At the third level of prevention, the use of general system resources, including internal and external environments, was maximized. All steps were performed by three experienced research assistants who were expert in the format steps of Newman theory. After collecting the data, it was entered into SPSS-21 software and analyzed by descriptive (table, mean and standard deviation) and inferential statistics (paired t-test, independent t-test and ANCOVA) at a significant level of 0.05.

Findings

Comparing the demographic characteristics of the research units in the two groups, the result of Chi-square test did not show a significant difference between the two groups in terms of gender (P=0.7) and marital status (P=0.19). Independent t-test did not show a significant difference between the two groups in terms of age (P=0.79), and Fisher exact test did not show a significant difference between the two groups in terms of education (P=0.74), (Table 1).

Independent t-test did not show a significant difference between the intervention and control groups before the intervention in terms of anxiety level (P=0.58). However after the intervention, it showed a significant difference between the intervention and control groups in that regard (P<0.01), so the level of anxiety in the intervention group was lower compared to the control group. Paired t-test did not show a significant difference between the anxiety levels of the control group before and after the intervention (P=0.1), but it showed a significant difference in the anxiety level of the intervention group before and after the intervention (P<0.01), (Table 2).

Table 1. Comparison of absolute and relative frequency distribution of demographic variables in the intervention and control groups.

Variables	Intervention group frequency (%)	Control group frequency (%)	Significant level
Female	18 (60)	16 (53.3)	P=0.7
Male	12 (40)	14 (46.6)	
Age	55.13 ± 20.27	53.83 ± 17.36	P=0.79
Single	6 (20)	5 (16.6)	P=0.19
Married	24 (80)	25 (83.3)	

Illiterate	4 (13.3)	5 (16.6)	P=0.74
Secondary education	6 (20)	7 (13.3)	0.28
High school diploma	11 (36.6)	9 (30)	0.28
Bachelor's degree	7 (23.3)	8 (26.6)	0.28
Higher	2 (6.66)	1 (3.33)	0.28

Table 2. Comparison of anxiety level in the intervention and control groups before and after the intervention.

Time	Before intervention	After intervention	P-value
Group	Mean \pm SD	Mean \pm SD	
Intervention group	8.83 \pm 1.53	6.06 \pm 2.77	P<0.01
Control group	7.93 \pm 1.46	8.36 \pm 1.18	P=0.1
P-Value	P=0.58	P<0.01	

ANCOVA test also showed a significant difference in the study variable before and after the intervention ($P<0.01$, $\eta^2=23\%$) by eliminating the effect of pre-test, so that 23% of changes in the dependent variable could possibly be associated with the intervention.

Discussion

Results of this study showed that Newman system model was effective in reducing the anxiety of patients undergoing endoscopy. Ahmadi, et al. in their study showed that the use of Betty Newman model reduced stress and anxiety in mothers of hospitalized children [14,15]. Montano showed that Betty Newman system model played an important role in reducing stress and increasing adaptation in patients, as it helped to understand stress [17]. Studies on nursing theories and models have shown that, the use of nursing theories has an important role in reducing stress and anxiety, and increasing adaptation in patients [22-24]. Ahmadi, et al. believes that Betty Newman theory reduces anxiety and stress in patients with multiple sclerosis [25].

Sengun, et al. argues that Betty Newman model plays an important role in increasing the quality of nursing care and patient satisfaction [26]. Basgu, et al. states that Betty Newman model in addition to reducing stress, increases problem solving skills and self-esteem of patients [18]. Gomez showed that by using Newman model we can prevent and plan to reduce patient stress and anxiety, as it predicts actual and potential stress [27]. Kowsalya, et al. believes that Newman model has an important role in reducing patient anxiety.

This model plays an important role in reducing patient anxiety before invasive procedures such as endoscopy by identifying the causes and aggravation of stress and applying preventive behaviors [28]. İşik, et al. in a study showed that, the implementation of Betty Newman theory plays an important role in reducing stress and psychological symptoms, as well as increasing the quality of life in hemodialysis patients [29]. Results of studies show that, the use of nursing theories play an important role in understanding patient needs [30,31]. The use of nursing theories in clinical care can maintain care standards, reduce treatment costs and disease complications and subsequently, increase the quality of care [14,26]. On this basis, it can be said that the use of nursing theories and models play an important role in increasing the quality of nursing care [32-34]. Newman theory is one of the applied theories in nursing care that promotes nursing care. For this reason, the use of continues and theory-based care models has an important role in nursing promotion. One of the limitations of this study was the cultural and economic differences of the samples that the researcher tried to resolve by delivering the training according to the samples' level of understanding, literacy and culture.

Conclusion

According to the results of this study, it can be said that the use of nursing models and theories play an important role in reducing treatment costs, complications and length of hospital stay, as well as increasing the quality of nursing care. Therefore, the healthcare managers and professionals are recommended to emphasize on the use of nursing theories and models. The use of nursing models and theories has an important role in improving professionalism, reducing treatment costs and disease complications, and increasing the quality of care and patient satisfaction.

Acknowledgments

This article is part of a research project approved and financed by the Research Committee of Torbate Heydariyeh University of Medical Sciences. We would also like to thank the participants and those who helped us in this study.

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How to cite this article: Sadeghi, Zahra, Mohsen Sahebanmaleki, Maryam Ebrahimpour Roodposhti and Maliheh Eshaghzadeh, et al. "The Effect of Betty Newman System Model on Anxiety of Patients Undergoing Endoscopy at Torbat Heydariyeh 9th Day Hospital." *Clin Schizophr Relat Psychoses* 15(2021). Doi: 10.3371/CSRP.SZMS.010622.