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Analysis of the Impact of Johnson's Behavioral Model on Anxiety of Mothers of Children with Cancer

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Abstract

Background: *Nowadays, cancer is one of the most critical health problems. The present study aimed to investigate the impact of the Johnson Behavioral Model on the anxiety of mothers of children with cancer.*
Methods: *This empirical study was done on 66 mothers of children with cancer in the centers covered by children with cancer in 2020. The samples were selected using simple random sampling. Data were collected using the Spielberger demographic and anxiety inventory. After data collection, data analysis was done in SPSS18 using descriptive statistics and independent t-test, paired t-test, chi-square test, fisher, and covariance test. The significant level was set at 0.05.*
Results: *The anxiety level was equal to 112.39±18.22 and 111±20.07 before intervention and equal to 81.21±6012 and 108.42±18.37 after the intervention in the intervention and control group, respectively. The independent t-test showed no significant difference between the two groups before the intervention (Pvalue=0.769). However, the difference was significant after the intervention (Pvalue<0.01). The paired t-test showed a significant difference between the two groups before and after the intervention in the intervention (Pvalue=0.001) and control (Pvalue<0.001) groups.*
Conclusions: *The results obtained from this study showed that the Johnson theory plays a key role in reducing the anxiety of mothers of children with cancer.*

Keywords: Johnson behavioral model, Anxiety, Mothers of children, Cancer.
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Introduction

Nowadays, cancer is one of the most critical health problems and can leave harmful effects on the physical, mental, social, and economic aspects of human life, so that more than 7.6 million people die as a result of cancer each year. Cancer is the second cause of death of children below 14 years old in Iran. Also, about 0.4 of mortality of children below 5 years old and 0.13 of mortality of children in the age group of 5.10 years old is because of this disease.[1,2] However, cancer has been changed into a chronic disease from a fatal and severe disease as a result of advancements in medical sciences. Because of the long-term duration of treatment, the families suffer from continuous stress, and the mental health of the whole family, especially parents, would be endangered. The mothers of these children suffer from mental disorders more than the parents of normal children.[3]

One of the psychological variables in the field of cancer is worry. Anxiety is one of the most underlying components of anxiety and can be defined as unpleasant prediction and expectation in the future. The concept of anxiety can be divided into cognitive and behavioral components. Anxiety as a behavioral component can be appeared in different forms in people; although worry as the cognitive component of anxiety is more stable, and prosecutes similar patterns in people. Hence, analysis of worry is more careful than anxiety and is divided into two normal and pathological worries.[4]

The nurses and health professionals are charged to analyze the psychological problems to help more adaptability and balance. Using the theories as clinical evidence for critical thoughts and decision-making can increase the professional ability of nurses. When nurses use theoretical models and evidence for the formation of their professional skills, they can improve the quality of healthcare. Johnson's theory has been formed and developed based on sociological theory, biological theory, and other theories, and professional activities.[5,6] According to Johnson's behavioral model, it could be found that the background of his period was changed from a disease-oriented model into a patient-oriented model. The theory could change the nursing style from the worry of disease into the worry of all behaviors of patients. Also, the model emphasizes the evaluation and intervention of the individual behavioral system.[7,8]

Johnson's behavioral system model is a model of nursing care, based on which human is considered as a living thing with seven subsystems. In case of dysfunction of one of these subsystems, the individuals may experience imbalance. Mothers of children with cancer suffer from an imbalance in various dimensions because of the anxiety and stress imposed on them. Also, the scholars need to use nursing theories in the clinics, so that the gaps of theoretical science and clinic can be reduced, and the studied theories can become more applicable. Various studies have shown that the family of cancer patients with high anxiety levels experience high levels of pain, fatigue, and depression. In this field, taking various interventions can be effective.[9,10] A study showed that analyzed the impact of Johnson's behavioral model on cancer patients, and have shown the positive role of the theory to increase the efficiency of children with cancer.[6] The aim of this study was to investigate the effect of Johnson's theory of behavior on the anxiety of mothers of children with cancer hospitalized in child support centers in Gorgan in 2020.

Materials and Methods

The experimental study was done on 66 mothers (33 mothers in the intervention group and 33 mothers in the control group) of children with cancer in the centers for supporting children with cancer in Gorgan. The samples were divided into two intervention and control groups using simple random sampling. The statistical population in this study consists of all mothers of children with cancer referring to centers for supporting children with cancer. The study was registered under the ethics code IR.IAU.CHALUS.REC.1399.010 in the ethics committee and clinical trial code of IRCT20200612047741N1 in the clinical trial system. The sample size was measured (33 individuals per group) using G*POWER software based on the investigations of Khanjari et al.,[11] with an impact size of 0.75 and test power of 80% at the significance level of 0.05.

For data collection, a demographic information paper, and the Spielberger state-trait anxiety inventory (STAI) were used. The STAI inventory is in state-trait form scored by a 4-point Likert scale. The state anxiety is rated on a 4-point scale (never, sometimes, generally, and too much), and the trait anxiety is rated on a 4-point scale (almost never, sometimes, most of the time, almost always). High levels show severe anxiety, and low levels show mild anxiety. Mild anxiety was rated from 20 to 29; almost mild anxiety was rated from 30 to 49, almost severe anxiety was rated from 50 to 69, and severe anxiety was rated from 70 to 80. The Cronbach alpha of state subscale was measured to 0.92 and was obtained to 0.90 for the trait subscale by Leyfer et al.[12]

For the study, the author could get the phone number of mothers by studying the records of patients. In this phase, the author gained the consent of mothers of children with cancer and explained the process of filling out the questionnaire. Also, the mothers were ensured that their answers would remain secret. They were also informed that they would be placed in the control or intervention group randomly. In the time of answering the questions, they were ensured that they could cancel their participation whenever they wanted. Before beginning the intervention, the Spielberger state-trait anxiety inventory (STAI) was filled out by both control and intervention groups. Then, the intervention group received six training sessions on different days and 45 min per day (225 min total) with the content of Johnson's behavioral theory. The sessions are presented in table 1. At the end of session 4, the training package was delivered to mothers. Collected data were entered into SPSS18 after coding. The data were used to compare the demographic information in both groups using descriptive statistics (mean value and standard deviation), and inferential statistics (chi-square and fisher test). Also, paired t-test was used to compare pre-intervention and post-intervention data in each group. An independent t-test was used to compare two groups. Descriptive statistics like frequency distribution, mean value, standard deviation, and inferential statistics (paired t-test, independent t-test, and covariance analysis) were used to classify and summarize the data.

Results

The most age group participating in the study was between 31-40 years old. In terms of education, 19 (57.6%) individuals in the intervention group were illiterate, and 13 (39.4%) in the control group were in secondary school level. In terms of the number of children, 23 (69.7%) mothers in the intervention group and 25 (75.8%) mothers in the control group had two children. Besides, 14 (42.4%) individuals in the intervention group were suffering from blood cancer, and 9 (27.3%) individuals in the control groups were diagnosed with other types of cancer (table 2).

The mean value of anxiety in the intervention group was obtained at 112.39±18.22 and 81.21±6.12 in the pre and post-intervention phases, respectively. The value for the control group was obtained 111±20.07 and 108.42±18.37 before and after the intervention, respectively. Accordingly, the mean value of anxiety in both groups in the pretest was in level 1. The anxiety of the intervention group was significantly decreased in the posttest phase; although no significant change was observed in the control group. Besides, a paired t-test showed significant differences before and after the intervention in the intervention (Pvalue=0.001) and control (Pvalue<0.001) groups. According to the significance level in the posttest (Pvalue<0.001) (table 3), the covariance test showed a significant difference by controlling the pretest variable. By controlling the pretest effect, 75% of variances in the posttest were because of the independent variable and intervention (Eta=0.751, Pvalue<0.001) (table 4).

Table 1. Summary of training sessions based on Johnson's theory

Session	Dimension	Training content	Time
1	Introducing	Filling out the questionnaires, answering questions of mothers, introducing mothers to each other, determining Intervention and control groups	45 min
2	Achievement and belonging subsystem	Training the cause of disappointment and sadness of child, and how to meet it, preventing isolation of child and providing an intimate environment for the child and family, and teaching to have good behavior with the child	45 min
3	Protection and saving subsystem	Training protection against fever infection, the ways of preventing that, how to observe that, good diet and how to save energy, preventing fatigue and participation, energy improvement, making balance between activity and rest	45 min
4	Excretory and digestive subsystem	Training the way to prevent damaging the rectum membrane, and observing the rectum hygiene, training on the way of preventing anorexia, observing the mouth hygiene, and prevention of Stomatitis	45 min
5	Review	Reviewing with mothers and answering their questions	45 min
6	1 month later	Refilling out the questionnaires	45 min

Table 2. The demographic information of patients participating in the study

Variable	Subgroup	Intervention frequency (percentage)	Control frequency (percentage)	Pvalue
Mothers age groups	20-30	3(9.1)	4(12.1)	0.607
	31-40	21(36.6)	20(60.6)	
	41-50	6(18.2)	9(27.3)	
	51-60	3(9.1)	0(0)	
Mothers' education	illiterate	19(57.6)	9(27.3)	0.081
	Cycle	5(15.2)	13(39.4)	
	High school	4(12.1)	2(6.1)	
	Diploma	3(9.1)	6(18.2)	
	Associate degree	1(3)	2(6.1)	
	Bachelor's degree and higher	1(3)	1(3)	
Job	Free	3(9.1)	2(6.1)	0.341
	housewife	30(90.9)	29(87.9)	
	Other	-	2(6.1)	
Income (Rials)	Under one million	28(84.8)	16(48.5)	0.963
	One to two million	4(12.1)	16(48.5)	
	Two to three million	3(1)	1(3)	
Number of children	1	8(24.2)	8(24.2)	0.788
	2	17(51.5)	16(48.5)	
	3	5(15.2)	4(12.1)	
	4	3(9.1)	5(15.1)	
Child age (year)	Below 1	1(3)	0(0)	0.522
	1-3	0(0)	1(3)	
	4-7	9(27.3)	7(21.2)	
	up7	23(69.7)	25(75.8)	
Detection time (months)	1-20	4(12.1)	5(15.2)	0.314
	21-40	10(30.3)	9(27.3)	
	41-60	7(21.2)	8(24.2)	
	61-80	2(6.1)	6(18.2)	
	Up 81	10(30.3)	5(15.2)	
Number of chemotherapy sessions	1-10	8(24.2)	21(63.6)	0.699
	11-20	11(33.3)	7(21.2)	
	Up 21	14(42.4)	5(15.2)	
Type of cancer	ALL	3(9.1)	3(9.1)	0.780
	Blood	14(42.4)	7(21.2)	
	Lymph	4(12.1)	5(15.2)	
	Brain and spinal cord	0(0)	6(18.2)	
	bone	4(12.1)	3(9.1)	
	Other	8(24.2)	9(27.3)	

Table 3. Determining the anxiety in mothers of children with cancer before and after intervention in two groups

Time	Group		
	Control	Intervention	Pvalue
Before the intervention	111±20.07	112.39±18.22	0.769
After the intervention	108.42±18.37	81.21±6.12	0.001

Table 4. The impact of Johnson theory on the anxiety of mothers of children with cancer

Source of variance	Total squares	Degrees of freedom	Average squares	F	Pvalue	Eta
Modified model	18199.926	2	9099.963	95.107	<0.001	0.751
Post-test separator	2718.490	1	2718.490	2718.490	<0.001	0.311
Anxiety group	5981.683	1	5981.683	62.517	<0.001	0.498
Group	12840.006	1	12840.006	134.196	<0.001	0.681
Error	6027.892	63	95.681	-	-	
Sum	617600.00	66	-	-	-	
Total	24227.818	65	-	-	-	

Discussion

The present study was conducted to investigate the impact of Johnson's behavioral model on the anxiety of mothers of children with cancer. The results showed that Johnson's theory plays a key role in reducing anxiety. However, multiple studies have been conducted on Johnson's theory and its underlying role in nursing performance to diagnose the problems, plan, valuation of nursing cares, making sure of the health status of the patient, and increased quality of nursing cares. Besides, the

theory encompasses the emotions, needs, and tendencies of individuals. Therefore, Johnson's behavioral system model is useful in different clinical environments and age groups. The theory can be used by inpatient, outpatient, and social environments and nursing management.[13,14]

According to the results, the two groups showed no significant difference in terms of pre-intervention anxiety; although the value was significantly increased in the intervention group in the post-intervention phase. In the study conducted by Glona Peack et al, it was found that the anxiety and depression of mothers and children with cancer were decreased in the post-intervention phase. This shows that it is necessary to use the intervention to decrease the effects of cancer.[15] Findings of Carmassi et al. showed that the mothers of children with cancer experienced more post-traumatic stress compared to mothers of normal children (Pvalue<0.001). Besides, the psychological compatibility of children with cancer was lower than those without cancer (Pvalue<0.001). No significant difference was observed between the two groups in terms of anxiety level (0.79).[16]

The findings of Manzoomeh et al., based on ANCOVA analysis showed that training relaxation techniques could decrease physical complaints, anxiety, lack of social function, depression, and increased tolerance in the posttest phase (Pvalue<0.001). Besides, the results of repeated measures analysis of variance (RMANOVA) showed that the impact of training relaxation techniques on anxiety (Pvalue<0.001), lack of social function and depression (Pvalue<0.001), and tolerance (Pvalue<0.001) was preserved up to the follow-up phase. According to these results, it could be mentioned that training relaxation techniques should be a therapeutic plan for the mothers of children with cancer in the hospitals and consultant centers.[17] The findings of Zeinep et al. showed that the interventions can reduce the stress of child and family. On the other hand, the interventions enhance the quality of life and make the child cope with cancer, which can finally cause improvement. Therefore, providing social-psychological support for the children and their families can leave a positive effect on the disease process, because increased relaxation can result in coping with cancer and controlling the emotions.[18]

Based on our study, the majority of mothers showed mild anxiety. In the study conducted by Bilani et al., under the title of "Congenital disease and health anxiety in parents of children with cancer", the main purpose was to determine the prevalence of anxiety in the population of parents of children with cancer and to investigate the relationship between recognizing positive and negative disease with anxiety on 105 samples. The results showed that the prevalence of anxiety in parents of children with cancer was equal to 21%.[19] In the study of Warmer dam et al. under the title of "prevalence of depression and post-traumatic stress among parents of children with cancer", the main objective was doing a meta-analysis to determine the prevalence of anxiety and mental disease in the parents of children with cancer. The results showed that the cancer periods were divided into four groups of (1) under treatment, (2) discontinued treatment (3) died, and (4) with a level of unknown cancer.[20]

The strength point of this study is that no similar study has been conducted on the mothers of children with cancer, and underlying issues like state-trait anxiety of mothers. The weakness of this study was the inadequate cooperation of mothers because of the situation of their patients. Also, the lack of generalization of the findings to other studies was another weakness, because this study was done just on the children with cancers in the studied centers. It would be better for further studies to do this study in other centers for children with cancer using the census method so that the effectiveness of the model can be claimed. Besides, a similar study should be conducted on other patients to show the effectiveness of the theory.

According to the results obtained from this study, Johnson's theory plays a key role in controlling anxiety in mothers of children with cancer. The method should be trained in these centers for the mothers of children with cancer, and the personnel working there, who play a key role in these centers. The interventions should be taken effectively to improve the situation of mothers of these children.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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