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RANDOMIZED CONTROLLED TRIAL TO DETERMINE THE EFFECTIVENESS OF A MULTIMEDIA TEACHING PROGRAM ON MANAGEMENT OF INFANTS' COLOSTOMY: EVALUATION OF ITS IMPACT ON CAREGIVERS

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ABSTRACT

Aim: the aims of this study were to develop multimedia-based learning resource material and to evaluate its effectiveness in terms of knowledge and skill attainment by infants' caregiver.
Method: in this randomized controlled trial, 60 mothers whose infants had undergone colostomy surgery and were hospitalized in pediatric hospitals affiliated to Tabriz and Tehran University of Medical Sciences were selected using convenience sampling. The participants were divided into two groups of education with illustrated booklet and multimedia teaching program (MTP) using simple random sampling. In both groups, before education, an awareness questionnaire was filled by mothers and the caregiving skills of mothers were evaluated using an observation checklist. Based on group type, the mothers participated in a 30-minute educational session about colostomy and how to care for it using an illustrated booklet or multimedia CD. The first posttest were administered 5 days and the second posttest after one month, respectively. Then, filling the awareness questionnaire and the evaluation of skills using the observation checklist by blinded researcher. The collected data were analyzed using the descriptive and inferential statistical tests in SPSS software V.13.
Results: the score for the awareness and caregiving skills of mothers in the experimental group was higher than those of the control group five days after the initial intervention. One month after the initial intervention, this score was still higher than the initial stage of intervention but lower than the fifth-day intervention.
Conclusion: a multimedia teaching program can have an impact on the awareness and caregiving skills of mothers in a longer duration of time.

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Introduction

The birth of a healthy infant is one of the most important experiences of a parent's life which is accompanied by immense joy(1). However, the birth of an infant with congenital anomalies brings about a high level of stress in the family and

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interferes with their daily life(2). Therefore, the families of newborns with congenital anomalies have special needs which are different from the needs of the families of healthy infants(3).

Currently, chronic diseases are the main reason behind health problems in developed countries existing in all age groups and various cultural, social and economic groups. One of this diseases in infants is the congenital defect of the gastrointestinal tract whose treatment involves colostomy surgery. This corrective surgery is performed in cases of anorectal anomalies, imperforate anus, rectovesical, retroportal and rectovaginal fistula, Hirschsprung's disease, trauma, and necrotizing enterocolitis(4).

Currently, family-oriented care has become the focus of pediatric specialty care centers. The results of some studies show that the parents are the most important aspect of the treatment since infants are not able to take care of themselves and need a knowledgeable caregiver(5). The family's role is to learn about the condition of their infant and medical treatment, check their infant's behavior, hospitalize the infant, and visit health professionals(6). Therefore, in order to care for their infants, the family (especially mothers) need to have a correct understanding of the illness(7). In these situations, the mothers need to have practical knowledge about the special needs and special care of their infant so as to reduce any short-term and long-term side effects (8). The mothers' engagement in the care of their infants leads to better identification of and response to their infant's behavioral symptoms. Nurses play a key role in educating and supporting the patient and family in difficult times. One of the main ways that nurses can care for mothers to reduces their problems is empowering them by providing them with necessary information and creating such conditions for mothers facing this new situation that leads to their cooperation in the correct care of their infants(9). During the treatment, nurses must support the infant and mother by empowering the mother through educational programs (understanding and caring for colostomy) (10).

The process of education and providing a learning opportunity for the patient's mother increases their ability to care for their infant(11). According to existing evidence, currently, lecture methods and sometimes a pamphlet or educational booklet, which are the oldest methods, are used to teach the infants' mothers(12). However, in many studies, the superiority of learner-oriented methods over lecture methods is reported (13).

In the last few decades, based on the changes and developments of technology, the necessity for using modern educational methods in various sciences such as nursery and revising educational methods so as to eliminate the weaknesses of traditional educational methods seems inevitable (12). On the other hand, following the development of technology, the number of people who use computers for education and improving their knowledge has increased. One of the relatively modern methods is using practical educational software based on information technology such as computer, cellphone, and other methods (12).

Multimedia education includes the advantages of films. Both in the form of VHS or CD, films can be used to convey basic concepts to patients in a short amount of time, and since it has predetermined content, it is more effective than on-the-spot methods(14). The advantages of this method include the ability to store the information, continuous learning and the reduction of the learner's stress during education. Furthermore, using color, movement, and various visualizations leads to better learning and increases the understanding ability of the learner. This method is also inexpensive and cost effective.

Many studies have shown the effectiveness of this method in patients diagnosed with asthma, cancer, and kidney failure. Nonetheless, few studies have been done regarding the results of using multimedia education and the effectiveness of modern methods compared with traditional methods. Moreover, there hasn't been any studies considering this group of patients (colostomy). Therefore, the researchers conducted a study with the objective of evaluating the effectiveness of using a multimedia teaching program, which is considered a type of electronic education compared with routine education mainly using educational booklets, in terms of the awareness and caregiving skills of mothers whose infants had undergone colostomy surgery.

Method

Study Design:

This study is a pre-posttest single-blind clinical trial which was conducted after receiving permission from the ethics committee of Tabriz University of Medical Sciences and recorded in Iranian Registry of Clinical Trials with code IRCT201601264613N17.

60 mothers whose infants had undergone colostomy surgery because of anomalies in their gastrointestinal tract. The participants were willing to participate in the study and they were randomly assigned to two groups of control (education with illustrated booklet) and experimental (multimedia teaching program).

The infants' age was between 2-28 days, colostomy surgery was performed because of anomalies in their gastrointestinal tract, they had no medical complications other than colostomy, the surgery was performed two days prior to inclusion in the study, the mothers were the main caregiver, and they had reading and writing literacy.

The infants who had undergone colostomy surgery and met the study inclusion criteria were hospitalized in the pediatric hospital affiliated to Tehran and Tabriz University of Medical Sciences.

Instruments: the first section of the questionnaire, which intended to extract personal and social information from the participants, included questions about mother's age, number of children, level of education, employment, how long before the study was the infant diagnosed, infant's age, gender, height, weight, prescribed medicine, etc. in order to evaluate the

mothers' awareness, the second section of the questionnaire included 20 researcher-made questions about colostomy and its related caregiving skills. A correct answer was given a score of 1 and an incorrect answer was given a score of zero making a scoring total between 0 and 20. The groups were compared based on average score. A 50-item questionnaire was used to evaluate the awareness of mothers. If the observed behavior was acceptable, a score of 1 was given and if the behavior was unacceptable or there was an absence of behavior, a score of 0 was given.

The validity of the questionnaire and checklist was measured using content validity index and content validity ratio (CVR). A group of experts was asked to evaluate each item using a three point scale (necessary, useful, and not necessary). Based on Lawshe's table, 0.51 was decided as an acceptable CVR value. In order to determine the content validity index, the questionnaire was given to 10 scholars and they were asked to judge the relevancy and clarity of instrument items according to Waltz and Bussel content validity index. Then, based on the mean of the content validity index scores of all instrument items, the mean of the content validity score of the instrument was calculated; items with a score higher than 0.79 were considered acceptable, items with a score between 0.7 and 0.79 were revised, and items with a score lower 0.7 were considered unacceptable. The reliability of the questionnaire was determined using Cronbach's Alpha whose value was 0.78 and the reliability of the checklist was calculated to be 0.92 using inter-rater reliability.

The participants were assigned to two groups (multimedia teaching program and illustrated booklet) using computer-generated random numbers with an allocation ratio of 1:1. The numbers were given to participants in non-clear identical paper packets. All mothers were asked to answer the awareness questionnaires about colostomy and its related caregiving skills. Using credible nursery and medical books and also using the educational booklet of a treatment center, the educational content was produced in an understandable and non-technical language for the mothers. The efficiency of the educational content was first evaluated by at least 8 nursery faculty members and pediatric gastrointestinal surgeons and then revised accordingly. The educational content of the control group was an illustrated booklet and for the experimental group, it was a multimedia CD with content similar to the illustrated booklet. The CD was designed using text, figures, animation, and film. In the control group, the mothers were individually educated on colostomy and its related caregiving skills during a 30-minute session with one of the researchers using the illustrated booklet in a calm environment. The mothers were given the opportunity to ask their questions at the end of the session. In the experimental group, the mothers were individually educated on colostomy and its related caregiving skills during a 30-minute session with one of the researchers using the prepared multimedia content displayed on the researcher's personal laptop in a calm environment. The duration of the multimedia film was 20 minutes recorded in the Persian language and consisting of images about colostomy and its related caregiving skills. The mothers were given the opportunity to ask their questions at the end of the session. The multimedia CD was not given to mothers at the end of the session to prevent them from sharing it with the participants of the control group and possibly compromising the results. In order to have more access to the participants, their phone numbers were taken and their appointments were assigned to 5 days and one month after the initial intervention. If they visited the pediatric clinic five days after the initial intervention, they were given the first awareness posttest and the second posttest was given to the participants one month after the initial intervention. If they didn't visit the pediatric clinic, they were contacted by their phone numbers and they filled the awareness questionnaire at their homes on the same day. At the same time, the colostomy caregiving skills of mothers were observed and recorded by a research assistant who was not aware of the participants' group allocation (blind) using an observation checklist.

Statistical analysis: in order to determine the consistency between some of the demographic characteristics, independent t-test and Chi-square were performed. The difference between the mothers' scores of awareness and caregiving skills was measured using repeated measures ANOVA among and between the groups in three periods of initial intervention, and five days and one month after initial intervention. Data analysis was performed using SPSS software V.13 with a significance level of α=0.05.

Results

during the study, 72 patients were hospitalized, 9 of which didn't meet the study inclusion criteria and 3 of which refrained from participating in the study. Therefore, the study was conducted with 60 mother-infant pairs (30 in each group), all of whom participated until the end of the study (Flowchart 1). The pregnancy age of infants was 35.6±4.16 in the control group and 37.4±2.13 in the experimental group. The majority of mothers in the control group had an education level of lower than senior high school (60%) and the majority of mothers in the experimental group had an education level of higher than senior high school (60%). The majority of mothers in both groups were housewives (60%). Regarding the parents' education, mothers' employment status, the fathers' employment status, number of previous children, the gender of the studied infant, the ratio of infant weight to pregnancy age, and the Apgar score of minute 1 and 5, there were no significant statistical difference between the two groups and they were homogenous.

The mean of the mothers' awareness score in the initial intervention was 2.1 for the experimental group and 1.8 for the control group. Meanwhile, 5 days after the initial intervention, the mean of the mothers' awareness score was 13 for the experimental group and 2 for the control group. One month after the initial intervention, this score was 12.4 for the experimental group and 1.9 for the control group (Figure 1). The results of repeated measures ANOVA among and between participants in the three times measurement of the mothers' awareness in control and experimental groups showed that there

is a significant statistical difference between the mothers' awareness in control and experimental groups. There is also a significant difference between the two groups in all stages of measurement (initial intervention and five days and one month after the initial intervention). The results of repeated measures ANOVA among and between participants in the three times measurement of the mothers' awareness in control and experimental groups indicated that multimedia education is more effective in improving the awareness of the mothers compared with education using illustrated booklet (Table 1).

Moreover, the mean of the scores of the mothers' caregiving skills in both control and experimental groups was 3.4 in the binging of the study. Meanwhile, 5 days after the initial intervention, the mean of the scores of the mothers' caregiving skills was 33.7 for the experimental group and 3.6 for the control group. One month after the intervention, this score was 32.9 for the experimental group and 3.5 for the control group. The score for the caregiving skills of mothers in the experimental group increased five days after the initial intervention. One month after the initial intervention, this score was still higher than the initial stage of intervention but almost the same as the fifth-day intervention. Whereas, in the control group, the score for the mothers' caregiving skills didn't have almost any change one month after initial intervention compared with five days after the initial intervention (Figure 2). The results of repeated measures ANOVA among and between participants in the three times measurement of the mothers' caregiving skills in control and experimental groups indicated that multimedia education is more effective in improving the caregiving skills of the mothers compared with education using illustrated booklet (Table 2).

Discussion

There was no significant statistical difference between the scores of the mothers' awareness and caregiving skills at the beginning of the study which indicates that the two groups are homogenous. However, a considerable increase and significant statistical difference were observed in the mean of the mothers' scores of awareness and caregiving skills in the experimental group compared to the control group in the first and second posttest stage measurements (five days and one month after the initial intervention). These findings indicate that multimedia education has been effective in improving the awareness of the mothers but education using the illustrated booklet has not been desirable. The reason behind these findings is the effect of the characteristics of the multimedia CD entitled "caring for an infant who has undergone colostomy surgery" on improving the learning experience and positive behavioral changes in the infants' mothers. Similar to this study, a review study has also shown the superiority of multimedia educational material over printed educational material (25). These results are also consistent with a study conducted by Dabas et al. (2016) in which there was a significant increase in the mothers' knowledge of their infant's colostomy (from 10.9 ± 2.5 to 16.4 ± 1.67 and 15.9 ± 4.02, $P = 0.001$) and the score of their caregiving skills evaluated by an observation checklist immediately after education with video (from 5.6 ± 2.0 to 9.8 ± 1.6 and 8.6 ± 2.1, $P = 0.00$)(15).

The results of the current study are consistent with the results of the study conducted by Hakim et al. (2015) in Ahvaz, Iran entitled "Impact of family-oriented empowerment model on the knowledge level of parents who have an infant with stoma"(16). However, the results of this study are inconsistent with the results of the studies conducted by Shahsavari et al., Ghezelbash et al., Saba et al., and Meibodi et al which indicated the superiority of oral education over electronic education (using computers)(17-20). This inconsistency could be due to the difference between presented content, target groups, and manner of material presentation. The results of this study, namely the superiority of multimedia education over traditional education in the stages after initial intervention, are also inconsistent with the results of the studies conducted by Khandan, Khakbazan et al. and Jabbari(21, 22). Regarding the superiority of an educational method, Mollazadeh states that effective educational methods exist whether they are face-to-face or online. He recommends the prediction, observation, and revision approach and believes that considering and observing the whole educational course before implementation is of utmost importance(23).

Researchers believe that compared with education using an illustrated booklet, a multimedia teaching program is more effective in improving the knowledge and skills of the mothers whose infants have undergone colostomy surgery. According to researchers, empowering the parents leads to accepting responsibility, better collaboration with health professionals, satisfaction, better response to treatment, preventing stoma side effects, reducing stoma treatment costs, and a more positive attitude toward the illness.

Moreover, in this study, the parents' caregiving skills improved more than their awareness in one month. This could be due to the low literacy level of mothers and the higher rate of improvement in caregiving skills could be due to their concern regarding correct and efficient care for their infant. Another reason for this could be that the participants had a higher skill attainment ability than cognitive ability and therefore attained better caregiving skills. Another reason could be the fact that more attention was paid to the manner of caregiving rather than explanations about colostomy. It could be stated that for the participants, the need for caregiving has been more important than awareness about colostomy.

Ultimately, it can be said that the results of this study indicate that by using modern educational methods such as multimedia education for parents whose infants have a stoma, their caregiving knowledge and the prevention of stoma side effects can be increased. The side effects of inadequate care for the infant's stoma can be delayed as much as possible and prevent extra costs on the patients and the health system for treating the side effects. This type of education can increase awareness in the

long-term and consequently, a more sustainable learning experience is provided leading to more efficient caregiving skills for the infants.

Conclusion

According to research results, using modern educational methods such as a multimedia teaching program improves the knowledge and caregiving skills of mothers whose infants have undergone colostomy surgery. Therefore, because of the effectiveness and simplicity of multimedia education, this method is recommended for other illnesses. This type of education can increase awareness in the long-term and consequently, a more sustainable learning experience is provided leading to more efficient caregiving skills for the infants. Since the sample for this study was not large enough for further generalization, it is recommended that this study be repeated with a larger population for future research.

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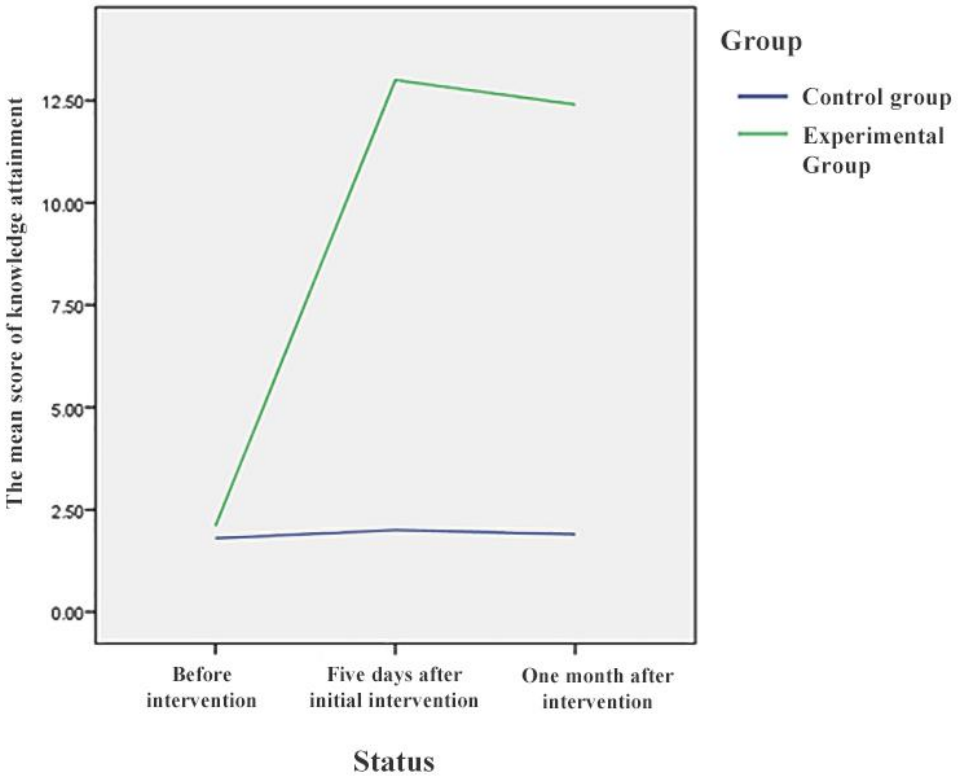


Figure 1. The difference between the mean score of mothers' knowledge in both groups in the stages of initial intervention, five days after initial intervention and one month after initial intervention. (N=60)

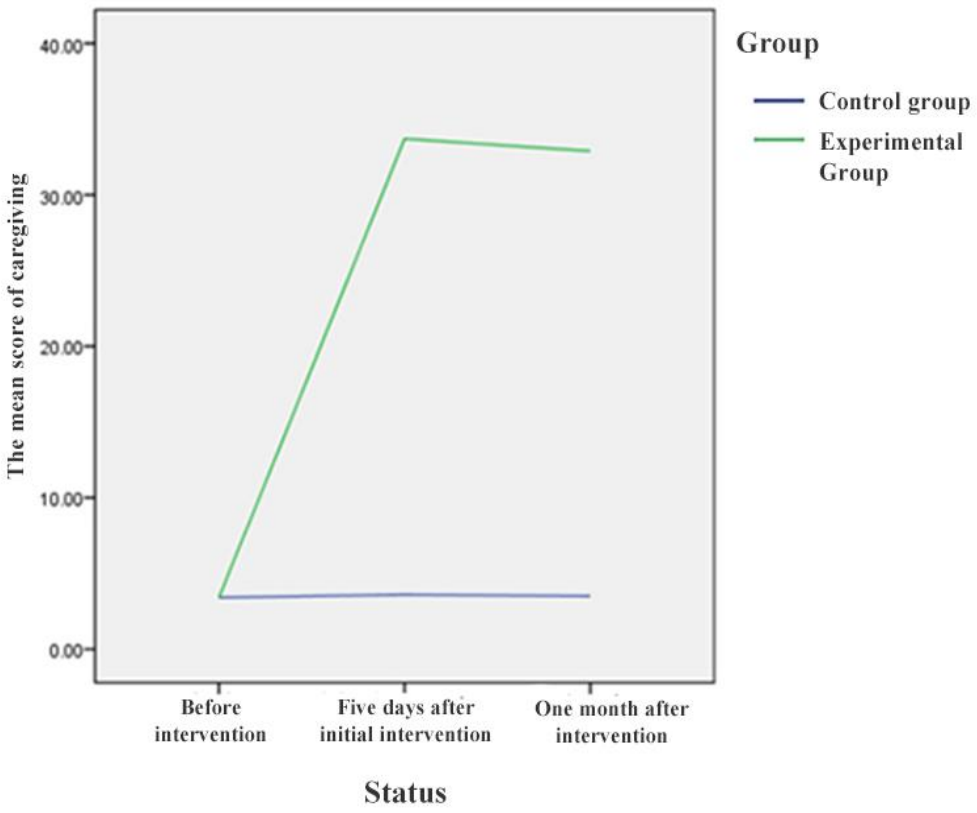


Figure 2. the difference between the mean score mothers' caregiving skills in both groups in the stages of initial intervention, five days after initial intervention and one month after initial intervention.

Table 1. The results of repeated measures ANOVA among and between participants in the three times measurement of the mothers' awareness in control and experimental groups

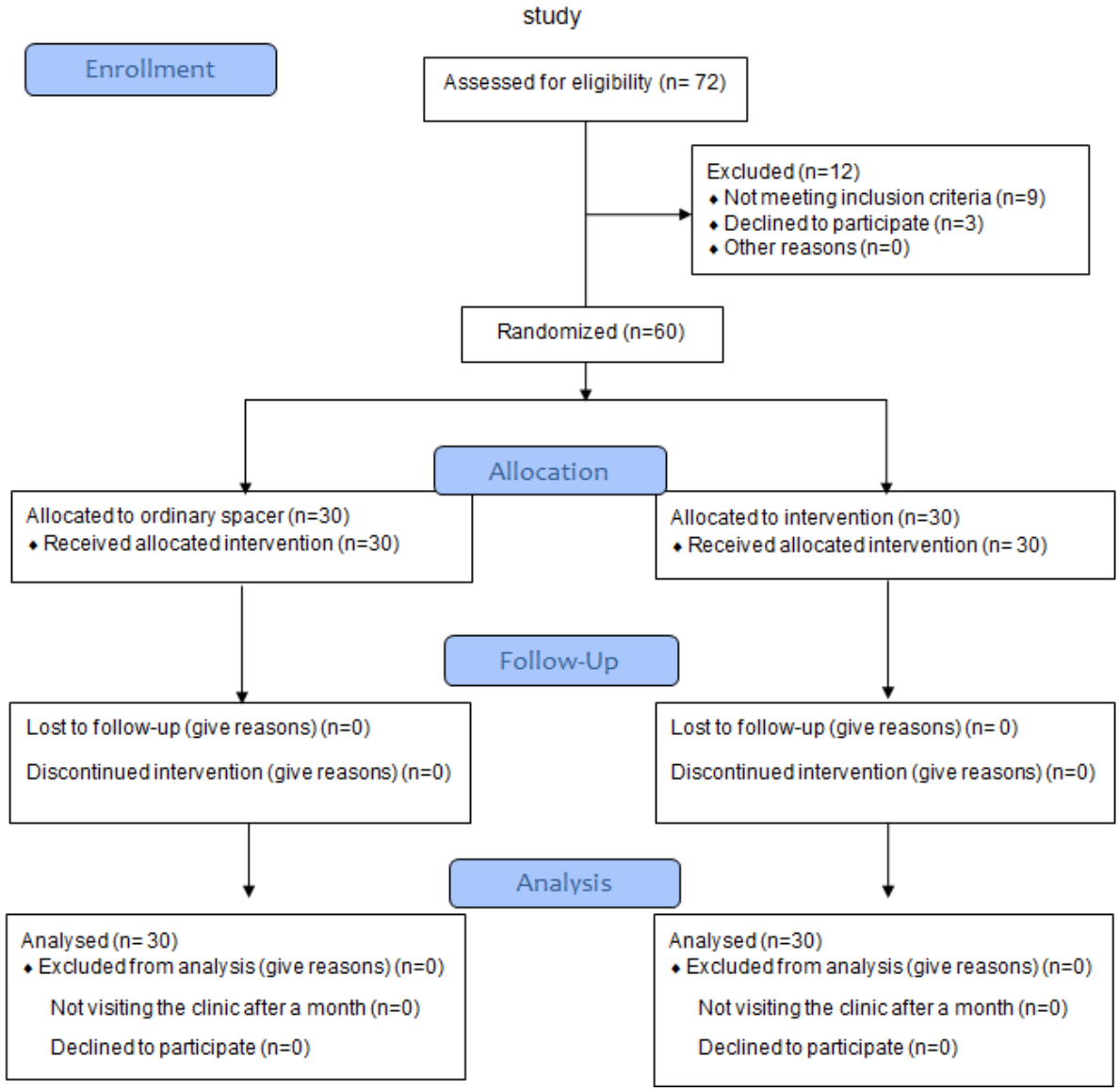
	Source of variation	Sum of squares	Degree of freedom	Mean of squares	F	significance
Between participants	Group	792.067	1	792.067	65.54	0.000
	Error	217.533	18	12.085		
Among participants	Factor	386.433	2	193.217	40.378	0.000
	Factor and group	364.633	2	182.317	38.10	0.000
	error	172.267	36	4.785		

Table 2. The results of repeated measures ANOVA among and between participants in the three times measurement of the mothers' caregiving skills in control and experimental groups

	Source of variation	Sum of squares	Degree of freedom	Mean of squares	F	significance
Between participants	Group	5900.417	1	5900.417	165.047	0.000
	Error	643.5	18	35.75		
Among participants	Factor	3012.033	2	1506.017	162.715	0.000
	Factor and group	2951.433	2	147.717	159.441	0.000
	error	333.2	36	9.256		

CONSORT 2010 Flow Diagram

Figure 1: Flow diagram describing, recruitment, randomization, and analysis of the study



References

1.Moawad GENA. Coping strategies of mothers having children with special needs. journal of biology Agriculture and health care. 2012;2:77-84.
2.Nisell M Ojmyr, Joelsson M, Frenckner B, Rydelius PA, christens son K. How a family is affected when a child is born with anoreetal malformation interviews with three patients and their parents. journal of pediatric nursing. 2003;18:423-32.
3.Fonseca A, Nazare B, canavarro MC. Patterns of parental emotional reactions after a pre-or postnatal diagnosis of a congenital anatomy. Journal of reproduction and infants psychology. 2011;209:320-33.
4.Khan K, Younas M, Waheed T. management of colostomy in infancy. Journal of postgraduate medical institute. 2011:17.
5.Ramezani T, Shirazi ZH, Sarvestani RS, Moattari M. Family-centered care in neonatal intensive care unit: a concept analysis. International journal of community based nursing and midwifery. 2014;2(4):268.
6.Swallow V, Lambert H, Clarke C, Campbell S, Jacoby A. Childhood chronic-kidney-disease: a longitudinal-qualitative study of families learning to share management early in the trajectory. Patient education and counseling. 2008;73(2):354-62.
7.Turan T, Bashakkal Z , S. O. Effect of nursing interventions infants in neonatal intensive care unit On stressors of parents of premature. Jurnal of clinical nursing. 2008;17(28):56- 66.
8.Ameh EA, mshelbwala pM, sabiu L, chirdan L B. Colostomy in children-an evolution of acceptance among mothers and caregivers in adeveloping country. South African journal of surgery. 2009;44:138-9.
9.Melnyk BM, Feinstein NF, Alpert-Gillis L, Fairbanks E, ret al. Reducing premature infants' length of stay and improving parents' mental health outcomes with the Creating Opportunities for Parent Empowerment (COPE) neonatal intensive care unit program: a randomized, controlled trial. Pediatrics. 2006;118(5):e1414-e27.
10.Hockenberry MJ, Wilson D, Wong DL. Wong's Essentials of Pediatric Nursing2015.
11.Lhatooni M, samiei-seiboni F, shafiei Z. the impact a fan educational software designed a bout fundamental of nursing skills on nursing students' learning of practical skills. Journal of clinical nursing and midwifery. 2014;3(1):9-16.
12.nasiriM, Adarvishi S. The effective of teaching anatomy by mobilephone compared with its teaching by lecture. Journal of medical education development. 2014;7(14):4-103.
13.Namnabati M, Fathi Azar E , valizadeh S. lecturing or problem-based learning: comparing effects of the two teaching methods in academic achievement and knowledge retention in pediatrics course for nursing students. Iranian Journal of medical education. 2001;10(4):474-82.
14.Pormirza kalhohi R. The effect of exercise respiratory on incidence of acute respiratory complication and patient bedridden after coronary artery transplantation in imam ali hospital of kermanshahan. Tehran: Tehran University; 2001.
15.Dabas H, Sharma KK, Joshi P, Agarwala S. Video teaching program on management of colostomy: Evaluation of its impact on caregivers. Journal of Indian Association of Pediatric Surgeons. 2016;21(2):54-6. doi: 10.4103/0971-9261.176933. PubMed PMID: PMC4790128.
16.Hakim A, Palizban E, Ahmadi Angali K. The effect of family-centered empowerment model on the Level of parents' knowledge of children with ostomy. Journal of Pediatric Nursing. 2015;1(4):22-31.
17.Shahsavari Isfahani S, Mosallanejad L, Sobhanian S. The effect of virtual and traditional methods on students learning and competency–based skills. Bimonthly Journal of Hormozgan University of Medical Sciences. 2010;14(3):184-90.
18.Saba MS, Bazmamoun H, Razavi Z. Comparison of Face to Face Education with Other Methods to Pregnant Mothers in Increase Exclusive Breast Feeding. Scientific Journal of Hamadan University of Medical Sciences. 2005;12(3):42-7.
19.Qzelbash A, Atashzadeh F, Alavi Majd H, Yaghmaei F. Comparison of ECG correct reading learning method of problem solving and learning in lecture and tutorial method with computerized nursing students. Journal of-Nursing Research. 2008;3(11):7-15.
20.Mohammad Kalantarimeibidi AY, Samira Esfandiari. The Effect of Education on the Knowledge and Practice of Emergency Department's Nurses Regarding the Patients' Triage. 2014;1(1):40-44.
21.Khandan M , Noohi E. Effect of electronic self-care education and applying continues care on practice in type diabetic patients: a randomized clinical trail. Journal of kermanshah. 2012.
22.Khakbazan Z, Jamshidi F, Abbass M, DamghanianM. Comparison of the effects of two teaching methods (lectures-training packages) on their knowledge about puberty health. Journal of Nursing Midwifery and science - life research. 2008;14(1):41-8.
23.Mollazadeh H, Kameli A, Jafari chogan M, Mirhosseini F, SHoja M. Comparing the Effect of Education by Lecture and Multimedia Software on Learning of Fundamental of nursing in nursing students. Journal of North Khorasan University of Medical Sciences. 2014;6(1):160.