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Restriction of the Family-Centered Care by COVID-19: A Supportive Educational Program for Fathers to Improve the Eating Behavior of Hospitalized Pediatrics

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ABSTRACT

Background: Poor oral nutrition is one of the important outcomes of hospitalization in children with respiratory disease, which may lead to insufficient energy intake. Deterioration of nutritional status during hospitalization affects clinical outcomes seriously. This study aimed to investigate the effect of an educational-supportive program for fathers on the eating behavior of hospitalized pediatrics with pneumonia in the COVID-19 pandemic. **Methods:** In this clinical trial, 40 children aged 12 to 36 months with pneumonia were selected together with their parents, after which they were randomly assigned to control and intervention groups. The intervention group received an educational supportive program face-to-face and virtually. Then, the father established an online video communication with the child and his mother as the main caregiver, while the control group received routine care. The data collection tools included the demographic questionnaire and the children's eating behavior questionnaire (CEBQ) completed by the mother during admission and 7 days later. **Results:** The results of the study showed no significant differences between any of the demographic variables of the study ($P > 0.05$). The mean eating behavior of the two groups before the intervention was 104.25 ± 6.20 and 105 ± 6.20, which were not significantly different ($P = 0.70$). However, the values of 113.2 ± 6.20 and 96.40 ± 6.20 were obtained after the intervention, indicating statistically significant differences ($P <0.001$). **Conclusions:** Planning and maintaining family integrity and educating and reminding parents of their role, including the fathers' supportive role, can lead to the improvement of a child's eating disorder during hospitalization for pneumonia.

Keywords: *Education; Support; Fathers; Pediatrics; Pneumonia; Eating behavior*

Introduction

Nearly 150 million children under the age of five are diagnosed with pneumonia each year, of whom 11-20 million are hospitalized with over two million deaths (Essouri *et al.*, 2017). Epidemiological studies conducted in a hospital in Iran revealed that 19.3% of children hospitalized in one year had pneumonia (Taheri Bajd, 2011).

Most cases of pneumonia in healthy children can be managed on an outpatient basis; however, there are concerns about the family's ability to

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care for the child and assess symptom progression for children with moderate to severe respiratory distress. These children should be hospitalized, since maintaining blood oxygen saturation, hydration, and nutritional support is often necessary for hospitalized patients (Tannous *et al.*, 2020).

Poor nutrition is one of the serious outcomes of hospitalization in infants with respiratory disease, leading to insufficient protein or energy intake. Evidence has shown that 24-53% of children admitted to the hospital suffer from chronic or acute malnutrition, which is exacerbated by hospitalization (Khademi *et al.*, 2019). Also, nutritional problems were reported in 44.9% of children admitted to one of the children's hospitals in Iran, of whom 26.3% had a moderate and 18.6% a severe eating disorder (Saraei *et al.*, 2016). About 70-80% of malnourished children were hospitalized and discharged without identifying or treating the problem of malnutrition (Sotoude *et al.*, 2016). Eating disorders in children can have a variety of causes, including poor nutrition, increased metabolism, psychosocial disorders, stress and anxiety, and physiological changes in infancy (Salavati Ghasemi *et al.*, 2015b).

The children seek independence in infancy, which is accompanied by new behaviors, such as physiological anorexia that can lead to significant changes in their appetite (Batool *et al.*, 2015, Salavati Ghasemi *et al.*, 2015b). Compared to adults, children are more vulnerable to malnutrition due to lower calorie reserves and higher nutritional needs per unit of body weight for growth (McCarthy *et al.*, 2019). On the other hand, the nutritional status of patients and their dietary compositions can significantly affect the pharmacokinetics and pharmacodynamics of drugs, ultimately affecting the use of drugs (Suskind and Lenssen, 2013)

Poor nutritional status during admission or its worsening during hospitalization seriously affects clinical outcomes. The immune response is disrupted among body systems, leading to delayed recovery and longer hospital stays. As a result, the financial burden (patient's daily expenses, treatment) on the health care system increases and restricts access to hospital beds (McCarthy *et al.*, 2019). In child care, adequate nutrition should support both the normal nutrients and the nutrients needed for optimal growth and development. However, nutritional status depends in part on current and past illnesses, and children's nutritional status affects their response to illness. Therefore, understanding and addressing the nutritional status of the hospitalized children is an important component of clinical care (Hockenberry and Wilson, 2018).

Hospitalized children need the simultaneous presence of their parents, both physically and emotionally. In other words, the child feels more relaxed in the presence of both of them, and the parents play an important role during hospitalization (Björk *et al.*, 2006). In fact, food is something that parents give to their children daily and can use without a prescription. This can give them a sense of participation while strengthening self-care (Dokken and Ahmann, 2020). According to the concept of family-centered care, parents should be involved in all stages of therapeutic care for sick children inside and outside the hospital (Ghaderi *et al.*, 2014). However, in many studies, mothers have formed the majority of participants in parental interventions, leading to a lack of information on the extent of fathers' involvement (Fletcher *et al.*, 2011). In some studies, fathers' participation in child care and hospitalization programs has been reported to be around 13-21% (Tully *et al.*, 2017).

Although mothers and fathers differ in their concerns, these concerns depend on their relationships with the child and their understanding of their parenting role (Beheshtipour *et al.*, 2014). Mothers and fathers affect their children in similar ways by considering their competence in social interactions, scientific progress, and mental health. However, studies have shown that fathers' involvement has a different role and nature compared to mothers. The study by Wilson et al. showed that children hospitalized in the father's absence felt fear and loneliness and requested the father (Wilson *et al.*, 2010). A study by Clary et al.

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found that children whose parents were in the hospital at the same time spent less time alone awake, crying, and had more social interactions with family members than with staff (Cleary *et al.*, 1986). However, few studies have examined the absence of the father and its consequences on the health of the child (Schmeer, 2009).

Given the widespread prevalence of COVID-19, physical or social distancing is the best way to reduce disease transmission; thus, some hospitals have restricted the presence of family members to ensure the safety of patients, staff, and family members. Hence, as this situation arises, ambiguity is created for committed staff on how to adhere to family-centered care principles (Dokken *et al.*, 2020, Hart *et al.*, 2020). Therefore, rapid adaptation of methods and tools for the family-centered care principles is essential to circumvent the restrictions of physical presence. One of the best ways is to use video communication technology (Dokken *et al.*, 2020); thus, the researcher conducted the present study to examine the effect of a supportive educational program for fathers based on video contact on the nutritional behavior of hospitalized children with pneumonia.

Materials and Methods

Study design and participants: The present study was a clinical trial with experimental and control groups and a pre-test and post-test design, registered on IRCT (https://www.irct.ir/) with IRCT20210421051029N1 ID.

This study was performed in selected hospitals of Isfahan University of Medical Sciences, and the research samples were children aged 12 to 36 months with pneumonia, hospitalized in pediatric wards, and their parents. The number of samples taking part in the study was estimated to be 44 people randomly assigned to the control and intervention groups (n=22 in each group) using the Randomized Allocation Software (RAS) program. According to the program, in addition to the presence of mothers as companions of the patient during the hospitalization of children, fathers were bedside the children during the hospitalization using the relevant technology (video call). The inclusion criteria were the age range of 12 to 36 months for the child, the first day of hospitalization with pneumonia, oral feeding and not receiving total parenteral nutrition or gavage based on the record, parents' ability to use video call, and the father should be alive in the family (not dead, etc.). Informed consent was considered, and the exclusion criteria were absence and non-participation of the father in two or more sessions, dissatisfaction and the unwillingness of the child's family to continue cooperation with the researcher, worsening of the child's disease which would lead to not receiving oral nutrition, receiving intravenous feeding, or NGT, death of the child, and discharge of the child before the implementation of the supportive training program.

According to the formula, at least 20 people had to be assigned to each group, which was considered 22 participants with the probability of 10% loss. Z1 indicated 95% confidence coefficient, i.e. 1.96, while Z2 indicated 80% test power, i.e. 0.84, and S represented the estimate of the mean standard deviation of the variable (nutritional behavior score) in each group. Finally, d represented the minimum difference between the mean score of the variable in two groups, showing a significant difference. The nutritional behavior between the two groups was considered 0.8S.

Measurements: The data were collected during 5 months from December, 2020, to May 2021. Demographic and CEBQ questionnaires were completed on the first day of hospitalization of the child and seven days after filling in the first questionnaire (after the intervention) using a questionnaire as parental reporting. The data were collected using a demographic questionnaire that assessed the number of children, education, occupation, economic status, sex, insurance coverage, and previous hospitalization and its duration. Then the CEBQ was completed. Wardell *et al.* developed this questionnaire in the UK. It is a 35-item questionnaire reported by a parent assessing a child's eating style. The questionnaire was scored based on a five-point

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Likert scale (from never to forever) and included seven subscales of food responsiveness (four items), enjoyment of food (four items), desire to drink (three items), satiety responsiveness, (five items), slowness in eating, (four items), food fussiness (seven items), emotional over-eating (four items), and emotional under-eating (four items). The mean score for each subscale was from one (low level of nutritional behavior) to five (high level of nutritional behavior). In fact, the answers got a score of 1-5, and mean and standard deviation were used to compare the control and intervention groups. The validity and reliability of the CEBQ have been measured in different studies and countries. The reliability of this test was reported by Cronbach's alpha of 0.91-0.72 in the original version, and the reliability through retest had a correlation coefficient at a range of 0.58-0.87. According to the analysis of the major factors, each scale had a separate factor that explained 50-84% of the variance (Wardle *et al.*, 2001). Nasirzadeh *et al.* also translated this questionnaire into Persian in Iran. They calculated the validity of the questionnaire using two methods of retest (two weeks interval, in a sample group of 93 people) and internal consistency using Cronbach's alpha index. The values of the total retest and the total Cronbach's alpha were 0.71 and 0.74, respectively, and at a range of 0.70-0.84 for the subscales. The results of factor analysis of the questionnaire also led to the extraction of six sub-scales, including emotional overeating, slowness in eating and lack of enjoyment, satiety responsiveness, desire to drink, and under-eating, which explained 53% of the variance (Nasirzadeh, 2017). In this study Cronbach's alpha was 0.871.

Intervention measures were performed in two stages for the fathers of the intervention group, including the training and the support stage. The supportive training program included the education and support of fathers with hospitalized children and mothers as the main caregivers of the patients. The content of the program was based on the needs of the research units, provided through the researcher's relationship with the participants, review of the existing articles and scientific texts, opinions of the supervisors, consultants, and specialists in pulmonology and psychiatry of children and pediatrics. Six professors of pediatrics in the School of Nursing and Midwifery, two medical professors, and two staff members of the pediatric department with a master's degree in Isfahan University of Medical Sciences confirmed the validity of the questionnaire. Content about the child at a young age (behaviors and physical symptoms) and the child's illness, the impact of the disease and hospitalization on the child and mother, the supportive role of the father, and physical and emotional care of the child during the illness, spouse support in critical situations, understanding each other, working together to solve problems, and not blaming each other about the child, along with tips on how to interact with children through video, were presented to the parents in the intervention group using PowerPoint slides. The child received contacts through video and social networks within four days (twice a day) to exchange information between the parents and the researcher, while previous coordination was made with the researcher before communicating with the child. Necessary support, such as nutrition education was given to the parents, and they were asked to read the educational materials shared in the virtual group before video communication. The fathers received the training by video communication twice with the cooperation and supervision of the researcher. They had a 15-30 minute video call with their child every day. Fathers were asked to bring with them materials and storybooks that included colorful pictures and fun characters, musical instruments, their child's latest work of art, such as a painting, or whatever they intended to show him. Such things led to more willingness of the child to continue communication with the parents, while also resulting in the children's peace of mind. It was also planned to share a snack or a meal with the child, so that the participants had the same snack

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or meal on both sides of the screen, and the adults pretended to deliver it to the child with pleasure from the camera. At the end of the video, the participants could play music and sing with each other or play age-appropriate games. Finally, they were asked to use a "kiss" to say goodbye. The control group completed the questionnaires at the time of admission and seven days after admission. The educational content was provided to the control group after the completion of the research.

Ethical considerations: To collect the data, the researcher referred to the selected hospitals after receiving the code of ethics from the ethics committee of Isfahan University of Medical Sciences with the ID IR.MUI.RESEARCH.REC.1399.630 and obtaining written permission from the School of Nursing and Midwifery of the Isfahan University of Medical Sciences. Then, the researcher presented the letter of introduction and explained the objectives of the research to the officials of the center and got their consent and cooperation. The samples meeting the inclusion criteria were then selected, and the parents were invited to take part in the research. To comply with the ethical standards, written consent was obtained from the child's legal guardian after providing sufficient information to the participants. Privacy and confidentiality of information were observed throughout the research process.

Data analysis: The data were analyzed using SPSS version 16 software (IBM, USA) with alpha value of 0.05. The missing values were excluded by analysis, and the samples excluded from the study due to their uncompleted program and questionnaire, were not analyzed.

Results

According to the results, members of both groups (intervention and control) were homogeneous in terms of demographic characteristics, and no significant difference was observed between the intervention and control groups ($P > 0.05$). The mean age of the children in intervention and control groups were 24.90 ± 3.02 and 23.95 ± 3.00 months ($P > 0.05$), respectively. Overall, 65% of the participants were males and 35% females. Most of the parents taking part in the study had a diploma or lower levels of education. Most of the families taking part in the study also had poor economic status, and insurance covered most of the families (**Table 1**).

The mean age of mothers was 29 years, with an average of one to two children. Overall, 40% of the children in this study were hospitalized only once, about 30% twice to three times, and about 27% more than three times, of whom 60%were hospitalized for less than a week and 40%for one to two weeks. Also, most mothers participating in the study were housewives, and most fathers were self-employed.

Before the intervention, the mean scores of eating behavior in the control and intervention groups were 104.2 ± 6.20 and 105.0 ± 6.2, respectively, indicating no significant difference between the two groups before the intervention ($P > 0.05$). After the supportive educational intervention, the mean scores of eating behavior in the intervention and control groups were 113.2 ± 6.2) and 96.4 ± 6.2, respectively, showing a significant difference between the two groups after the intervention ($P < 0.05$). The mean score of eating behavior before and after the intervention was significant in the intervention group ($P < 0.05$), but there was no significant difference in the mean score of eating behavior in the control group before and after the intervention ($P > 0.05$) (**Table 2**).

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Table 1. Demographic characteristics in the intervention and control groups at baseline.

Variables		Intervention	Control	P-value[a]
Age (month)	12-18	4 (20)[b]	6 (30)	0.45
	18-24	6 (30)	5 (25)	
	24-30	3 (15)	3 (15)	
	30-36	7 (35)	6 (30)	
Sex	Male	14 (70)	12 (60)	0.40
	Female	6 (30)	8 (40)	
Education	**Father**			
	Under diploma	7 (35)	2 (10)	0.40
	Diploma	10 (50)	9 (45)	
	Bachelor and higher	3 (15)	5 (25)	
	Mother			
	Under diploma	4 (20)	2 (10)	0.80
	Diploma	10 (50)	8 (40)	
	Bachelor and higher	6 (30)	10 (50)	
Insurance	Yes	19 (95)	18 (90)	0.86
	No	1 (5)	2 (10)	
Economic status	Good	1 (5)	2 (10)	0.24
	Moderate	8 (40)	6 (30)	
	Poor	11 (55)	12 (60)	

[a]: Chi-square test ; [b]: N (%)

Table 2. Within and between comparison of eating behavior scores in the two groups.

Groups or period of study		Mean ± SD	t	df	P-value
Control group	Before	105.00 ± 6.20	6.406	19	< 0.001[a]
	After	96.40 ± 6.22			
Intervention group	Before	104.25 ± 6.19	-6.498	19	< 0.001[a]
	After	113.20 ± 6.21			
Before	Intervention	104.25 ± 6.19	-0.382	38	0.70[b]
	Control	105.00 ± 6.20			
After	Intervention	113.20 ± 6.21	8.53	38	< 0.001[b]
	Control	96.40 ± 6.22			

[a]: Paired t-test; [b]: Independent t-test

Discussion

One of the important outcomes of hospitalization in infants and children with respiratory disease is poor oral nutrition, which may lead to insufficient protein or energy intake and significant impacts on the recovery process of the hospitalized child (Salavati Ghasemi *et al.*, 2015a).

Sick children often try to attract their parents' attention when they want to eat or drink. Thus, hospitalized children need the simultaneous presence of their parents, both physically and emotionally, indicating that both of them play an important role during the child's hospitalization (Björk *et al.*, 2006). However, many studies on parental interventions have focused on mothers, and there is not enough information concerning the extent of fathers' involvement (Freeman *et al.*, 2011, Panter-Brick *et al.*). According to the results of the present study, the educational-supportive intervention of fathers led to a significant increase in the mean score of eating behavior among children with pneumonia in the intervention group compared to the control group. Research conducted by the others (Morgan *et al.*, 2014, Vollmer *et al.*, 2015, Walsh *et al.*, 2017) showed that fathers, like mothers, affected their children's nutrition and eating behaviors, which was in line

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with the results of the present study. In addition to the impact of fathers on children's eating behavior, Welmer et al. also examined the impact of fathers on body mass index (BMI) in preschool children. The results of their study showed that the fathers' feeding habits and style were not related to the quality of the children's diet or weight status. However, the children's feeding behaviors were related to their BMI, and this relationship was adjusted to the paternal feeding relationships. Some of the children's appetite traits may be related to their weight status when exposed to certain paternalistic feeding methods (Vollmer *et al.*, 2015). In an intervention conducted by Morgan *et al.*, the effectiveness of the Healthy Dads, Healthy Kids program on fathers and their primary school children was evaluated, the results of which showed that healthy behaviors by fathers, such as healthy eating and activity affected children's eating behaviors and consequently their weight (Morgan *et al.*, 2014). The results of the study by Walsh *et al.* also showed that fathers saw themselves as active participants in their children's physical behaviors and nutrition (Walsh *et al.*, 2017).

However, contrary to the results of the present study, the study by Fangopo *et al.* on the effect of family and father intervention programs on children's eating behaviors showed that children's eating behaviors did not differ from before the intervention, and no difference was observed between mothers and fathers in the feeding functions of their children (Fangupo *et al.*, 2015). Such a difference could be due to reasons, such as differences in the environment, the type of education through social networks, and the family situation of the hospitalized child. Therefore, family-centered care as a care philosophy emphasizing the central role of the family in children's lives is an essential component of child care. It emphasizes the simultaneous presence of parents as a family to maintain the integrity of the child's family, providing unique care unique and promoting the health of infants, children, and families (Zeinali *et al.*, 2012).

Conclusion

COVID-19 pandemic and restricting hospitalization for families has affected families with hospitalized children; however, the results showed that educating and supporting fathers through social media and their online participation in the eating behavior of hospitalized children with pneumonia could be effective in the hospital. The use of a supportive educational program in this study led to the improvement of the eating behavior of hospitalized children with pneumonia, which is very important in the recovery process of hospitalized children. It is suggested that future studies focus on a larger sample size and other diseases, such as congenital malformations of infants and acute diseases leading to hospitalization of the children in the intensive care unit.

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Authors' contributions

Khaksar S, Kalhor F, and Maroufi M designed the research; Khaksar S conducted the research; Kalhor F analyzed the data; and Khaksar S and Kalhor F wrote the manuscript. Maroufi M finalized manuscript. All authors approved the final version of this work.

Conflict of interest

The authors of the article state that they have no conflicting interests in the present study.

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