

Effect of the Virtual Infant Care Program on the Dimensions of Father Participation

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Abstract

Aims: Father's participation is a broad, active and positive participation in the child's life and has three dimensions. The impact of father interaction is independent of the mothers' share, and the value of the father's love and affection in the child's health is as great as the mother's. The aim of this study was to determine the effect of infant care virtual education program on the dimensions of father participation.

Materials & Methods: This quasi-experimental study was performed on 83 participants. The fathers of the intervention group were trained by Soroush messenger at the same time as the child grew up. At four times, at the end of days 3 to 5 after birth, and 2, 4, 6 months after birth, the questionnaire on the degree of father's participation in the care of the infant was completed by the mother. Data were compared with repeated measures analysis of variance.

Findings: The results showed that the two groups were homogeneous at 3 to 5 days (before the intervention). However, the scores of direct interaction between child and father and access dimension, at two months, four months, and six months, and responsibility and funding at four months and six months in the intervention group were higher than the control group ($p < 0.01$).

Conclusion: Considering the current widespread use of virtual networks and its impact on people's lives and the important role of the father in the growth and development of the child, it is recommended to use this useful and cost-effective method to educate fathers and even mothers to increase public health.

Keywords

Infant care [<https://www.ncbi.nlm.nih.gov/mesh/?term=Infant+care>];

Father Participation [Note Found];

Virtual Education [Note Found]

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Introduction

The father's participation is a broad, active and positive participation in the child's life [1], which varies based on different ages and stages of the child's development [2]. The father's participation in the care of the infant has three dimensions: direct interaction between the child and the father (playing and caring for him), accessibility (the level of child's access to the father when needed), and responsibility and providing support (getting a doctor's appointment, family and child financial support) [3, 4]. Regarding direct interaction between the child and the father, in addition to dealing with the time that the fathers are in direct contact with the child, the quality and how this time is spent are also considered. Regarding establishing direct interaction, the father should hug the child, look at him directly, pay attention to the sound of his crying and the difference in his sounds in expressing different needs, play with him and take care of him or her alone; for example, he should change his/her diaper, wash and dry the child, massage the child and feel satisfied with the time spent with his child [5]. Accessibility means that the father is immediately available to the child when needed. Fathers should be available for the child in case of illness, screening, vaccination, sensation of danger, frequent awakenings at night and any declaration of the child's needs, and should not postpone the child's needs due to fatigue, work, leisure, study or exercise. The dimension of responsibility and providing the necessary financial support for the child, includes financial support of the family and meeting the needs of the infant, such as providing the necessary items for child care and making an appointment with the doctor when the child is sick [6]. The effect of fathers' interaction is independent of mothers' share and the value of father's love and affection in the child's health is as much as the mother's [6, 7]. There is also growing evidence that a father's involvement in child care affects his or her growth and development in the cognitive and social and emotional domains [8]. Regarding father absence in childhood, the growth and development of these children is less than normal and they have more behavioral and educational problems in the field of social interactions at school, have negative relationships with friends in adolescence, and are more anxious and depressed [9, 10]. But children who were cared for and played with their fathers had a more complete intellectual cognition at six months of age, solved puzzles better at a young age, and were more intelligent at three years of age [11].

Forty percent of fathers are involved in caring for their children. Different reasons have been reported in different cultures for the low participation of fathers in infant care. One of the most important reasons for the low awareness of many men about the care needed by women before pregnancy, during

pregnancy and after, is breastfeeding, nutrition and infant care [12]. Fathers often do not talk to their children, they just hug or look at them. Sometimes they do not know how to communicate with their children at all [13]; therefore, they need information and providing some services. Infancy is one of the most sensitive stages of life that requires proper knowledge and careful care. Given the breadth of information needed for couples and some misconceptions about dealing with infants, especially parents who give birth to their first child, there is a need for education on day-to-day care and how to deal with common infant problems. The findings of studies on families have shown that elementary education should be around birth because fathers at that time have high motivation to participate in their infant life [14]. Virtual education has created a new turning point in the field of education and learning, including in the medical sciences, which can be useful in this regard. Virtual education has been able to eliminate the shortcomings of traditional learning and education and has brought about many changes in education. Using the Internet in learning, new and efficient learning methods can be achieved. The reason for using information technology in learning is better and faster education [15]. To explain the role of the father in the care of the infant and its importance in the health of the child and the foundation of the family, fathers need education and since one of the duties of midwives is to consult with families in the care of infants, and due to the lack of access to fathers during working hours and health centers dealing with females to do face-to-face training, as well as transition from physical to virtual world in the information and technology era, we aimed at examining the fathers' e-learning to increase their involvement in caring for their children. It is hoped that the present study aimed at determining the effect of fathers' virtual infant care education on their participation in infant care and provide information to relevant officials and national planners, a step to attract more participation of fathers and promote child and family health programs.

Materials and Methods

The quasi-experimental study with two groups was done on 82 participants in health centers affiliated with the North Khorasan University of Medical Sciences using the cluster sampling. After approving the proposal and obtaining permission, first, two health centers (Hor and power plant) were randomly selected from seven health centers in Bojnourd and were divided into two groups of fathers' education and control according to random allocation. After preliminary studies and determining the sample size, the researcher was referred to the mentioned centers and selected the samples from primiparous families

who referred for neonatal hypothyroidism screening in the third to fifth days after delivery and were willing to participate in the research and met the inclusion criteria. The tools used in this study were a questionnaire for selecting the research subjects (mother and father) a questionnaire for omission during the research, a questionnaire for demographic information of mother and father, and a questionnaire for the degree of father participation in infant care. Father's participation in infant care in this study was assessed at four time points at the end of day 3 to 5 after birth, and 2, 4, 6 months after birth using a questionnaire on the rate of father participation in infant care (according to the mother's report) prepared by Bagheri *et al.* in 2015 based on the Lamb model, which its validity has been confirmed by content validation method and using internal consistency and Cronbach's alpha ($\alpha=0.89$) ($\alpha=0.86$), its reliability have been confirmed. This questionnaire consists of three parts that are divided into a 5-point scale from always to not at all: The first part contains 14 questions about the father's actions in the daily care of the infant based on the direct interaction between the child and the father, the second part includes 5 questions about the father's action in special circumstances, which examines the access dimension, and the third part, with 3 questions, evaluates the father's participation in caring for the infant in the dimension of responsibility and financing according to the Lamb model. After introducing and obtaining the written consent of the samples and their assurance about the confidentiality of the data, the researcher provided information about the objectives, steps, and methods of the study. In the intervention group, after selecting the family and completing the questionnaires, mother and father phone numbers were received and educational contents were prepared based on the child's growth and needs and based on the latest national references and instructions and step by step, as the baby developed, the fathers were trained and their questions were answered through Soroush messenger, then the mothers were asked to complete the father participation questionnaire when they were referred to the center to receive the health care and vaccination in the second, fourth and sixth months after birth. In the control group, the questionnaire on the rate of father's participation according to mother's report was completed by the mother on the third to fifth days, and two, four and six months after birth. The researcher contacted the samples one day before the age of two, four, and six months to ensure their referral. Then, after data collection, analysis was performed by SPSS software and repeated measures analysis of variance.

Findings

Sampling was performed on 100 samples, in the intervention group ten people and in the control group eight people withdrew from the study. The final analysis was performed on 41 patients in the intervention group and 42 patients in the control group. The mean (standard deviation) age of fathers in the intervention group was 32.70 (5.51) years and in the control group was 33.45 (6.73) years. The results of independent t-test showed the homogeneity of this variable in both groups ($p=0.583$). The two groups were homogeneous in terms of type of delivery and infant sex and satisfaction with infant sex based on mother's and father's viewpoint (Table 1).

There was no significant difference between the two groups at birth before the intervention, but after the intervention, the results showed high scores of direct interaction between child and father at two, four and six months after birth in the intervention group compared to the control group ($p<001$). After confirmation of the hypotheses, repeated measures ANOVA was performed for both groups. The results showed an increase in the direct interaction dimension over time ($p<001$; Table 2). There was a significant difference in the intervention group from birth compared to six months ($p<001$). But in the control group, the participation of fathers from birth to four months ($p=0.18$) and from birth to six months ($p=0.12$) was not significant.

There was no significant difference between the two groups in terms of access to father participation at birth before the intervention, but after the intervention, the results showed high scores of access to father's participation at two, four, and six months after birth in the intervention group compared to the control group ($p<001$). After confirmation of the hypotheses, repeated measures ANOVA was performed for both groups. The results showed an increase in the direct interaction dimension over time ($p<001$) (Table 3). In the intervention group, there was a difference in this score from birth compared to two months ($p=0.010$) and at birth compared to four months ($p=0.012$), but in the control group, the differences were not significant.

There was no significant difference between the two groups before the intervention in terms of responsibility and financing the father's participation at birth, but after the intervention, the results showed a high level of father's responsibility and financial support at four and six months in after birth in the intervention group than the control group ($p<001$). After confirmation of the hypotheses, repeated measures ANOVA was performed for both groups. The results showed an increase in the dimension of

responsibility and financial support of the father's participation over time, but the difference was not significant (Table 4)

Table 1) Relative and absolute frequency of social characteristics of fathers in the intervention and control groups

Variable	Intervention N (%)	Control N (%)	p-value
Education			
Primary	3 (7.4)	2 (4.8)	0.208
Secondary	6 (14.6)	4 (9.3)	
Diploma	21 (51.2)	16 (38.1)	
University	11 (26.8)	20 (47.6)	
Total	41 (100)	42 (100)	
Type of delivery			
Vaginal	21 (51.2)	25 (59.5)	0.495
Cesarean section	20 (48.8)	17 (40.5)	
Total	41 (100)	42 (100)	
Satisfaction with the sex of the baby from the mother's point of view			
Yes	39 (95.1)	35 (85.4)	0.091
Somehow	1 (2.4)	6 (14.6)	
No	1 (2.4)	0 (0)	
Total	41 (100)	42 (100)	
Satisfaction with the sex of the baby from the father's point of view			
Yes	11 (26.8)	9 (21.4)	0.296
Somehow	16 (39.1)	17 (40.6)	
No	9 (21.9)	8 (19)	
Total	41 (100)	42 (100)	
Sex of the baby			
Boy	38 (92.7)	36 (85.7)	0.076
Girl	3 (7.3)	6 (14.3)	
Total	41 (100)	42 (100)	

Table 2) Mean scores of direct interaction between child and father regarding father participation in infant care at birth, and at two, four, and six months in the intervention and control groups

Variable	Intervention	Control	p-value
At birth	29.60±13.09	25.90±10.50	0.158
Two months	33.95±11.79	27.69±10.27	0.012
Four months	38.00±10.71	28.16±11.14	0.000
Six months	40.58±10.15	29.21±11.12	0.000
p-value	0.000	0.010	

Table 3) Mean scores of the accessibility dimension of father participation in infant care at birth, and two, four, and six months after birth in the intervention and control groups

Variable	Intervention	Control	p-value
At birth	14.97±4.37	12.95±4.84	0.051
Two months	15.24±3.36	12.88±4.43	0.008
Four months	15.92±3.58	13.38±4.70	0.007
Six months	16.86±3.25	13.61±4.84	0.001
p-value	0.001	0.113	

Table 4) mean scores of the dimension of father participation in infant care at birth, and two, four, and six months after birth in the intervention and control groups

Variable	Intervention	Control	p-value
At birth	11.34±1.57	10.07±2.74	0.058
Two months	11.46±1.16	10.61±2.49	0.053
Four months	11.78±0.72	10.69±2.31	0.005
Six months	11.73±0.80	11.12±1.43	0.020
p-value	0.058	0.078	

Discussion

The main purpose of this study was to semi-experimentally determine the effect of the virtual educational program of infant care on the dimensions of father participation on 83 cases referring to the health centers affiliated with the North Khorasan University of Medical Sciences. The father's participation in the care of the infant has three dimensions: direct interaction between the child and the father (playing and caring for him), accessibility (the amount of the child's access to the father when needed), responsibility and providing support (getting a doctor's appointment, family and child financial support) [3, 4]. The results of the present study showed that regarding the dimension of direct interaction between child and father, the level of father interaction at two, four, and six months after birth was higher in the intervention group than the control group and increased, which is consistent with the results of a study conducted by Bagheri *et al.* (2015) entitled "The effect of educational program on the dimensions of participation of Iranian fathers." The results of this study indicated that the rate of father participation in the direct interaction dimension increased at weeks two, four, and six and was also higher than the control group [16]. However, Dorty *et al.* (2006) stated that the degree of father participation in the dimension of direct interaction between father and child in the intervention group who were trained, did not change compared to the control group. In their study, the interaction between father and child was examined in both direct and indirect modes, so that in direct interaction, the number of minutes that the father had face-to-face communication and interacted with the child was measured. Regarding indirect interaction, the number of minutes that the father spent with the child but did other tasks based on the father's daily report was measured in the days before 6 and 12 months of age [17]. The results of the present study are not consistent with those of Dorty *et al.*, which may be due to differences in the process of these two studies. They considered 6 and 12 months of age but we considered one, two, and four months of age. Considering that the first 2 months are a more critical time and the mother and child need more help; thus, participation in three dimensions and in general in the intervention group was more than the control group. Another difference between the two studies is that the tools for measuring the dimensions of participation in the two studies are different. In their study, time was considered for the dimensions of direct interaction and availability, whereas in the present study, father's performance on the dimensions of the questionnaire was measured by individual questions.

In terms of accessibility dimension, "the amount of child access to the father when needed" showed that this amount at two, four and six months after birth in

the intervention group was higher than the control group and increased, which is consistent with the results of the study by Tafazli et al. (2013) entitled "Comparison of the effect of infant care education on fathers and couples before birth on the participation of fathers in infant care". However, in this study, the education was face-to-face [18]. Dragnus (1992) measured the father's participation in direct infant care at first 4 to 6 weeks after birth and reported that 50% of fathers did not participate in their infant care due to workplace fatigue and only 16 to 25% of fathers were actively involved in caring for the infant (walking, bathing, or changing diapers) [19]. In Gartner's study, fathers were 19- 34% involved in child care, playing, and educating their infants on weekdays and 22 - 40% on weekends [20], which was lower than in the present study. Therefore, we can address the differences in culture, beliefs and conditions of society as one of the effective factors, As Burt (1994) acknowledges in his study, the prevailing culture and beliefs in society can affect the degree of fathers' participation in infant care in two economically similar societies [21]. Therefore, perhaps the greater participation of Iranian fathers than other studies is due to the special attention to the family in our culture, which arises from our Iranian and Islamic thinking. Another influential factor is the previous experience of the fathers, which in the mentioned studies, the fathers were not homogenous in this regard, but in the present study, only the fathers with the first experience were examined.

In terms of responsibility and providing the needs of the child (doctor's appointment, family and child financial support), the results showed that the level of father responsibility at four and six months in the intervention group was higher than the control group. At two months, this difference was not significant, and the level of responsibility in the intervention group did not increase significantly at 2, 4, and 6 months. This could be due to the greater sensitivity of the mother and those around the mother at this age. Also, because in the present study, only primiparous mothers were selected, these mothers have more stress and fear in child care. The results of Roostia (1993) are almost consistent with the results of the present study, but there are two major differences in the methods. In the present study, all three dimensions were examined and in the Roostia's study, the degree of father participation in caring for infants was compared with that of mothers but each parent should be compared separately and with their peers [22]. One of the limitations of the research was the possibility of the father not paying attention to the educational content of the created channel, which it was tried to encourage fathers to pay more attention to the content and read it by summarizing and making the subject interesting and concise, such as placing educational short films instead of merely readable contents and also get

more attention by answering fathers' questions about the child at certain times during the day.

Conclusion

According to the results of the study and the widespread use of e-learning, it is recommended that more attention be paid to father education (face-to-face/online) so that children experience a healthier and less challenging childhood by interacting more with fathers.

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References

- 1- Simbar M, Nahidi F, RamezaniTehrani F, Ramezankhani A. Fathers educational needs about perinatal care: A qualitative approach. *Hakim Res J*. 2009;12(2):19-31. [Persian]
- 2- unfpa.org [Internet]. New York City: United Nation Population Fund; c2009 [cited 2020 Nov 25]. Available from: <https://www.unfpa.org/>.
- 3- World Health Organization. The Millennium development goals and sexual and reproductive Health [Internet]. Geneva, Switzerland: World Health Organization. 2009 Oct- [cited 2021 Dec]. Available from: http://www.who.int/reproductivehealth/global_monitoring/index.html
- 4- Ramezanzadeh F, Shariat M. *Rproductive Health* (Vol 3). 3rd edition. Tehran: Arjmand; 2012. P. 1687. [Persian]
- 5- Marsiglio W, Day RD, Lamb ME. Exploring fatherhood diversity; implications for conceptualizing father involvement. *Marriage Fam Rev*. 2000;29(4):269-93.
- 6- Palkovitz R, Palm G. Transitions within fathering. *Fathering J Theory Res Pract*. 2009;7(1):3-22.
- 7- Shoghi M, Sanjari M. *Maternal and child health*. 1st edition. Tehran: Salemi Publication; 2008. [Persian]

- 8- Lamb ME, Catherine S, Tamis L. The role of the father in child development. 5th edited. New Jersey: John Wiley & Sons; 2010.
- 9- Cabrera N, Tamis-LeMonda C, Lamb ME, Boller K. Measuring father involvement in the early head start evaluation: A multidimensional conceptualization. The National Conference on Health Statistics; 1999 Aug 2-3. Washington DC: The College of Information Sciences and Technology; 2019.
- 10- Sharafi Sh. Father's role in child rearing and care. Unknown Publisher; 2013. [Persian]
- 11- Lamb ME, Tamis-Lemonda CS. Fathers' influences on children. In: The role of the father in child development. 1st edition. New Jersey: John Wiley & Sons; 2004. pp. 1-31.
- 12- Lewis C, Lamb ME. Fathers' influences on children's development: The evidence from two-parent families. *Euro J Psychol Educ.* 2003;18(2):211-28.
- 13- Palkovitz R. Involved fathering and child development: Advancing our understanding of good fathering. Oxfordshire United Kingdom: Taylor & Francis Group; 2002. pp. 119-140.
- 14- Goodman J. Becoming an involved father of an infant. *J Obstet Gynecol Neonatal Nurs.* 2005;34(2):190-200.
- 15- Ganjali F, Bahiraei MH. The effect of e-learning on mothers' awareness of pregnancy and childbirth. International Conference on Research in Science and Technology; 2015 May. Tehran: Economics and Energy Association; 2019. [Persian]
- 16- Bagheri M, Tafazoli M, Aemmi SZ, Boskabadi H, Emami Moghadam Z. The Effect of the Educational Program on Iranian Fathers' Involvement in Infant care: A Randomized Clinical Trial Study. *Int J Pediatr.* 2015;3(6):1057-63.
- 17- Doherty W, Erickson MF, Ralph L. An intervention to increase father involvement and skills with infants during the transition to parenthood. *J Fam Psychol.* 2006;20(3):438-47.
- 18- Tafazoli M, Bagheri M, Boskabadi H, Setayesh Y. The impact of training care infants to fathers and couple on the fathers' participations after birth. *Int J Pediatr.* 2013;1(1):31-8.
- 19- Dragonas TG. Greek fathers' participation in labour and care of the infant. *Scand J Caring Sci.* 1992;6(3):151-9
- 20- Gaertner BM, Spinrad T, Eisenberg N, Greving K. Parental childrearing attitudes as correlates of father involvement during infancy. *J Marriage Fam.* 2007;69(4):962-76.
- 21- Barratt M, Negayama K, Minami T. Father participation in the lives of their 4 month-old infant: The united states and Japan. Presented at the Symposium Early Childrearing in Japan; 1994 June. Amsterdam: The International Society for the Study of Behavioral Development; 2019.
- 22- Rustia J, Abbott D. Father involvement in infant care, two longitudinal studies. *Int J Nurs Stud.* 1993;30(6):467-76.