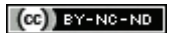# Effect of Telenursing on Level of Anxiety in Parents of Hospitalised Premature Neonates in Neonatal Intensive Care Unit

SALEHEH TAJALLI[1], ASAD IMANI[2], MAZLOOMEH HAMZEHKHANI[3], ELHAM SHAFIEI[4],
MINOO FALLAHI[5], NASRIN KHALESI[6], MANIJEH NOURIAN[7]

ABSTRACT

Introduction: Hospitalisation in the Neonatal Intensive Care Unit (NICU) as a closed chamber, separates neonates from their parents and causes anxiety in the parent's mind. Nurses can provide a great volume of information in a short period by telenursing.

Aim: To evaluate the effects of telenursing through phone calls on the anxiety levels in parents with neonates, hospitalised in the neonatal intensive care unit.

Materials and Methods: This before-after Quasi-experimental study, with a control group, was conducted from November 2018 to April 2019 among parents of premature neonates admitted in NICU of Mofid Children's Medical Centre, Tehran, Iran. They were selected through the convenience sampling method, 60 individuals were selected for this research, and they were divided into 30 participants for intervention and control groups. In the intervention group, 15 telephonic conversations between parents and nurses were done totally for 15 days. During these phone contacts, the researcher provided information to one of the parents about the neonate's respiration, recent vital signs, consciousness level, sleeping rhythm, feeding. The data was collected by using the self-report Beck Anxiety Inventory, and socio-demographics questionnaires. The Beck Anxiety Inventory was filled out once before the intervention and then after phone calls on the first day and fifth, tenth and fifteenth day of admission in the intervention groups. This was also filled out in control groups and were compared in both the groups.

Results: The findings indicated that there was a significant difference in terms of anxiety in the intervention group before (51.80±11.2) and after (25.1±3.4). There was a significant statistical difference between the intervention group and the control group in the fifth, tenth and fifteenth day of hospitalisation (p≤0.001). The anxiety level in the control group before (52.45±11.9) and after (50.43±10.18) intervention showed no significant difference.

Conclusion: The telenursing intervention was effective in reducing anxiety in parents who had their premature neonates in NICU.

INTRODUCTION

Neonatal Intensive Care Unit (NICU) dedicated about 10% of hospital beds to themselves. Although since 1995, the number of NICU beds increased about 26% [1,2]. Globally, 13 million neonates are born every year all over the world and about 5-18% of newborns are premature [3,4]. Most of these cases are born in Africa and Asia [5].

According to the World Health Organisation (WHO) report, 3,438 (5.7%) of premature infants are <32 gestational weeks, and the mean days of their hospital stay are 35 days [5,6]. Parents often experience stress, guilt, anxiety, depression, fatigue, sleep disorder, and fear, after the neonate's admission in NICU [7,8]. Families make decisions for neonates in NICU, and as a result, this responsibility increases their mental pressure [9-11].

Consequently, controlling the anxiety of parents is the priority. Thus, it is essential to consult and help them in the decision-making process [12].

Parents have a remarkable role in improving the patient's condition. The important fact is that, besides physicians and health personnel endeavours, the decisions, which were made by the parents also affects their infant's health [9,13]. Due to lack of information about the neonates' general condition and process of treatment; the decision making process adds in the parents' anxiety. Parents of neonates in NICU are interested in receiving understandable answers and also being informed about changes in their patients' clinical conditions [9,14]. By use of telenursing, it is possible to transfer a great volume of information in a short period of time.

Telenursing refers to representing nursing services by the means of applying communication technologies such as telephone, computer,

and the internet [12,15]. Among technological devices, Telephone is a traditional one used since past. Due to availability of this technology in almost all patients' homes, families are able to find answers to many questions they might have in mind, by home calls [13].

As far as searched, there was no previous research in Iran about telenursing on anxiety neonates' parents during hospitalisation, effect of telenursing on neonates in the NICU. Hence this study aimed to assess the effect of telephone notification by nurses on the parent's anxiety level, who had a premature neonate in the NICU of Mofid Children's Hospital affiliated to Shahid Beheshti University of Medical Sciences at Tehran.

MATERIALS AND METHODS

Study Design and Population

This Quasi-experimental study was conducted in the NICU of Mofid children's medical centre, Tehran, Iran from November 2018 to April 2019.

The Shahid Beheshti University of Medical Sciences Research Ethics Committee (IR.SBMU.RAM.REC.1394.352) granted ethical approval and the Iranian Registry of Clinical Trial code is IRCT 20190617043912N1. Approximately 129 new newborns are admitted to NICU each year and 30% of them are premature. For the sample size according to previous study, with a confidence level of 95% and test power of 90%, 60 individuals were selected for this research, and they were divided into 30 participants for each group [16].

The randomisation was performed by the central randomisation unit at the Neonatal Health Research Centre, using block randomisation

with the same block sizes. All participants were allocated a number. Then the randomisation numbers were given to the head of nursing staff. Thus, she allocated participants to intervention and control groups randomly. All participants provided written informed consent before the data collection; this included permission to use in publications.

Inclusion Criteria

All parents of infants admitted to neonatal intensive care units, have access to the telephone and no hearing or speech problems.

Exclusion Criteria

Parents who showed unwillingness to participate in the study, not able to understand and speak Persian and some who had no access to telephone services.

First, after admission into the NICU, the assistant researcher visited the parents and explained the research objectives. Then an informed consent was attained from the parents in both intervention and control groups, and the demographics form was completed for the parents and neonates.

In 15 consecutive days, the researcher called to the parents (each day, one call) and announced information to family member about recent vital signs of the neonate's respiration, consciousness level, sleeping rhythm, feeding, and the priority of physical attendance of his/her parents or absence of this necessity. The Beck Anxiety Inventory previously available to family members was filled out one time before intervention, and subsequently after phone contacts in first, fifth, tenth and fifteenth day of their neonates' admission by self-reporting method. Control group did not received telenursing intervention. Finally, the anxiety level of the participating parents in both the groups was assessed by using the beck anxiety inventory [Table/Fig-1].
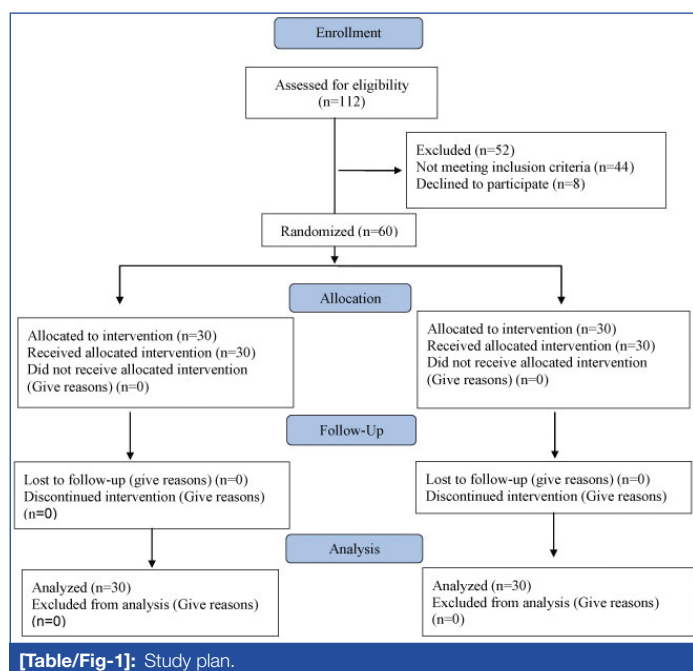
[Table/Fig-1]: Study plan.

Content validity of beck anxiety inventory was assessed and confirmed by 10 nursing academic board members, Shahid Beheshti University of Medical Sciences. For assess reliability, two methods were used: internal reliability and external reliability. To consider internal reliability, α-Cronbach's index was used and computed 96% in the present study and to consider external reliability identified as re-test method, it was used Interclass Correlation Coefficient (ICC) that obtained 85%.

An informed consent was signed and demographic questionnaire was filled out by the parents, 24 hours after hospitalisation of their neonate in NICU. In order to respect the confidentiality of the

participants' name, phone number of one of parents was recorded. This phone number is in access to researcher and saved as a special code with the recommended name of that member. Researcher has called only by one phone number that previously announced to family member.

All of phone calls were done during 16-16:15 in the evening. At the beginning of each conversation, the parents were asked to repeat parts of the former conversation to ensure that the proper understanding of previous conversation was attained. The average duration time of the conversations was 15 minutes.

The telephone intervention procedure was standardised and also recorded for each parent based on Cox's Interaction Model of Client Health Behaviour (IMCHB) [17]. It involved a systemic comprehensive assessment of the participant's requirements, including basic features like the type of participant's characteristics, the date, time, and nature of the call, as well as a detailed description of the symptoms, problems, or the call reasons. Moreover, all of the present study premature neonates' required NICU stay for 15 days as recommended by the physicians. Eight of premature neonates' require NICU more than 15 days. At the end of the intervention, a farewell ceremony was held for the parents and their neonates.

STATISTICAL ANALYSES

The samples were described by using descriptive statistical methods including the mean and the Standard Deviation (SD). The descriptive statistical method's findings were calculated based on both qualitative and quantitative data. Shapiro-Wilk test was used in order to determine the normal distribution of the data. Taking into account, the homogeneity of the qualitative factors in two groups, the mean score of the variables were compared between the two groups. This was done by using a parametric t-test, and also Wilcoxon test for non-parametric. Data analyses were performed in SPSS version 21.0 software.

RESULTS

Sixty neonates' parents were enrolled in this Quasi-experimental study. Minimum, maximum, and average ages of parents were calculated as 20, 39, and 29 years, respectively. Most of the participants were mothers (83.3%), and the majority of them had an education of a high school diploma (43.3%). The majority of neonates were girls, at 83.3% [Table/Fig-2].

Variable		Intervention N (%) or Mean±SD	Controls N (%) or Mean±SD	p-value
Parent age (year)		34±3.5	36±30	0.23
Parent sex	Male	5 (16.7%)	3 (10%)	0.21
	Female	25 (83.3%)	27 (90%)	
Parent education level	Illiterate	0	0	0.19
	Primary school	0	0	
	High school diploma	13 (43.3%)	10 (33.3%)	
	College	17 (56.7%)	20 (66.6%)	
Gestational age (week)		29±2.5	30±1.1	0.09
Neonate sex	Male	5 (16.7%)	3 (10%)	0.21
	Female	25 (83.3%)	27 (90%)	

[Table/Fig-2]: Demographic characteristics of premature neonates and their parents in two groups of intervention and control.

The [Table/Fig-3] shows the average anxiety scores at different stages of the research. Based on this table, at the beginning of the study (the first day of admission), there was no significant difference between the anxiety scores of the control and intervention groups (p>0.05). In other hands, The comparison mean of anxiety scores in the control and intervention groups in the first, fifth, tenth and

fifteenth day of admission showed a significant difference at the level of one percent error between two groups (p<0.001). Also, the p-value for the comparison of the mean total score during the 15 days of admission, which is equal to -8.44, is significant at a 1% error level.

According to the results of the Wilcoxon test in [Table/Fig-3], showed that daily conversations effectively reduced anxiety at 1% error level (p≤0.001) [Table/Fig-4].

	Mean (SD)			
	Control	Intervention	T-test	p-value
Before phone intervention	52.45 (11.9)	51.80 (11/2)	-0.21	0.04
After first day of admission	49.80 (9.7)	42.73 (7/1)	-3.22	0.002
After fifth day of admission	51.20 (11.1)	37.87 (6.3)	-6.74	≤0.001
After tenth day of admission	50.21 (10.8)	36.46 (4/5)	-7.71	≤0.001
After fifteenth day of admission	49.50 (7.4)	33.27 (5.3)	-16.41	≤0.001
End of intervention (average first, fifth, tenth and fifteenth day of admission)	50.43 (10.18)	25.1 (3.4)	-8.44	≤0.001

[Table/Fig-3]: Average of anxiety level of neonates' parents in the neonatal intensive care unit.

Time	Wilcoxon test	p-value
Before phone intervention and after first day of admission	-4.54	≤0.001
Before phone intervention and after fifth day of admission	-4.72	≤0.001
Before phone intervention and after tenth day of admission	-4.56	≤0.001
Before phone intervention and after fifteenth day of admission	-4.36	≤0.001

[Table/Fig-4]: Comparison of averages of anxiety level of neonates' parents between the intervention and control groups.

DISCUSSION

The results of comparing the mean scores of parents' anxiety levels between the intervention and control groups indicated that telenursing made a significant statistical difference in the intervention group.

Findings of a study showed that the effectiveness of active telephone support on breastfeeding premature infants in Sweden in 2013. They concluded that telenursing improved breastfeeding, maternal satisfaction, mother and infant attachment, and also alleviated maternal anxiety [18]. In another study, the effect of phone intervention by nurses on the mood and anxiety level of patients with implantable cardioverter defibrillators and their caregivers was assessed. They stated that eight weeks of telephone follow-up decreased the anxiety level considerably [19]. Also, a study was concluded that telenursing had a positive-effect on increasing attachment and mitigating the level of stress in mothers with premature infants [7].

Results of a study established that telenursing via the Internet was more effective and has fewer costs than the conventional hospital-based follow-up [17]. A study showed that telemedicine reduces care costs and enhances emotional support during and after hospitalisation [20].

Another study described a significant statistical relationship between informing families about patients' conditions and reducing their anxiety level after phone intervention [13]. Telenursing can be effective as a treatment plan for accelerating recovery after coronary artery bypass grafting [21].

In the present study, the mean score of primary anxiety before phone calls in the intervention group and in the control group was 51/80±11/2 and 52.45±11.9, respectively. However, after intervention, score of anxiety improved in intervention group. This

finding of the present study is to coordinate with above studies. It seems that resolving information' gap in patient's families by use of telenursing can improve their anxiety level.

Limitation(s)

Use of Beck Anxiety Inventory is a limitation due to its probable bias during self-reporting. Also, the different cultural context of participants in phone conversations can be effective in intervention output.

CONCLUSION(S)

The telenursing intervention was effective in reducing anxiety in parents who had their premature neonates in NICU for 15 days. Given the easy access to a telephone for almost all parents and its simple use, including this technology in the educational and care context of neonatal parents is recommended. Also, using this technology requires establishing remote communication methods courses in educational programs of nurses. In its context, this research provides the ground for further studies and technology introduction to the nursing field. In addition to that, the technology can be used in planning in order to cut and minimise the costs, caused by temporal and spatial limitations.

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PARTICULARS OF CONTRIBUTORS:
1. Student Research Committee, School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran.
2. Department of Nursing, Ilam University of Medical Sciences, Ilam, Iran.
3. School of Nursing and Midwifery, Shahroud University of Medical Sciences, Shahroud, Iran.
4. Clinical Research Development Unit, Mostafa Khomeini Hospital, Ilam University of Medical Sciences, Ilam, Iran.
5. Neonatal Health Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
6. Department of Neonatology, Ali Asghar Hospital, Iran University of Medical Sciences, Tehran, Iran.
7. Neonatal Health Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Manijeh Nourian,
Vali Asr Ave., Niayesh Cross Road, Niayesh Complex, Tehran-1985717443, Iran.
E-mail: manighea@yahoo.com

AUTHOR DECLARATION:
• Financial or Other Competing Interests: No
• Was Ethics Committee Approval obtained for this study?   Yes
• Was informed consent obtained from the subjects involved in the study?   Yes
• For any images presented appropriate consent has been obtained from the subjects.   NA