



Original Article

Impact of a health education tool on enhancing communication between health providers and parents of neonates in intensive care in Egypt

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Abstract

Background: Admission of an infant to the neonatal intensive care unit (NICU) is a stressful experience for parents. Parents' education improves knowledge and satisfaction. The purpose of this study was to evaluate the influence of using a family information guide about the NICU as a communication intervention between the healthcare providers and parents having their infants in the unit.

Methods: An interventional study was conducted among 100 fathers with their neonates inside the NICU-Kasr Al Ainy Teaching Hospital, Cairo, Egypt. The study passed through three stages: pre-intervention, intervention using a family information guide, and post-intervention.

Results: After using the guide, fathers showed significant improvement in their knowledge, with a change in their feelings towards the admission of their neonates to the NICU.

Conclusion: Providing sufficient information and increasing awareness of parents about the NICU in the form of a written guide is an effective way of improving communication between healthcare providers and parents.

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Keywords: communication; information guide; neonatal intensive care unit; satisfaction

1. Introduction

The neonatal intensive care unit (NICU) is a specialized unit providing medical treatment and nursing care after birth for infants born prematurely or with congenital defects.¹ Admission of an infant to the NICU increases parents' emotional stress, but attentive communication between parents and NICU staff has a significant effect on family adaptation to such stress.² Communication between the healthcare provider and the patients is important for the patients' experience of the healthcare service as well as for the outcome of care.³ Despite growing awareness of

the importance of good communication in healthcare settings, considerable problems such as misinformation, lack of information, and lack of responsiveness are still among the problems most often reported in surveys about patient satisfaction.⁴ Taking a family-centered approach regarding parent–provider communication may improve parent satisfaction. Many factors contribute to the parents' satisfaction in the NICU. These include assurance, emotional support, communication, provision of clear information about their infants, as well as involving the family in healthcare through providing them with appropriate health education. It is important for healthcare professionals to understand the parental experience when infants are admitted to the NICU, to meet the parents' needs and concerns and enhance their satisfaction, which will promote the quality of care in the NICU.⁵ Parents' anxiety is reduced when they can read about commonly occurring symptoms and how to cope best with such episodes themselves. It is considered that a combination of written health

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education material with personal individual instructions would make families benefit more from health intervention with the purpose of reducing the parents' anxiety and influencing their illness behavior in a desirable direction. Patient information may be either verbal or written. Health researchers suggest that written information reinforces verbal information and should be part of a planned educational program.⁶

Therefore, the purpose of the present study was to evaluate the influence of using a family information guide about the NICU as a communication intervention between the healthcare providers and parents with infants in the NICU, through assessing the improvement in parents' knowledge and changes in their feelings after using the guide. Better communication will eventually improve parents' satisfaction and promote the quality of care in the NICU.

2. Methods

2.1. Study setting and participants

The study was conducted in the NICU at Kasr Al Ainy Teaching Hospital, Cairo, Egypt, for a period of 6 months from March 2014 to August 2014. The study included 100 parents (represented by the father of the family) who had their infants in the NICU. To be included in the study, infants in the NICU had to be the first baby for the parents to be admitted to such a unit and should be newly admitted to the NICU (not transferred from another NICU). Also, the use of the guide had to be in the first 2 days after admission. Cases of congenital anomalies and surgical cases were excluded. All participants provided verbal consent to participate in the study.

2.2. Study design

The study was an interventional study in three stages. Pre-interventional stage: each father who met the study criteria was given a pre-interventional questionnaire and asked to answer it. Interventional stage: a family information guide was distributed to each father to read and understand the information. Post-interventional evaluation stage: the father received a post-interventional questionnaire that was identical to the pre-interventional one to assess his knowledge about the NICU after using the family information guide, and was asked to answer it.

2.3. Sample size determination

A pilot study was conducted on 30 parents prior to the study. It helped in confirming the reliability and validity of the questionnaire and in determination of the sample size. Type I error (α) was set to be 0.05 with a power of 80%. According to these settings and results of the pilot study, it was found that the adequate sample size was 93 participants. So, we decided to conduct the study on 100 participants. Sample size calculation was performed using PS Power and Sample Size Calculations version 3 (William D. Dupont and W. Dale Plummer, Jr.

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2.4. Pre structured questionnaire

The development of the questionnaire was based on a review of the literature, interviews with parents, and consultation with an expert group of health professionals. This process was designed to ensure content validity. A literature search was undertaken, using PubMed. The keywords used were “parent feelings”, “questionnaire”, and “knowledge about NICU”.⁷

The final questionnaire included 19 questions in Arabic. Eighteen questions were asked to the parent to rate a specific item on a 4-point Likert scale; strongly disagree, disagree (No), agree (Yes), and strongly agree (Sure). One question at the end was an open-ended question. Two types of questionnaires were developed: a pre-interventional questionnaire that also contained questions about sociodemographic data such as age, sex, educational level, and residency. The post-interventional questionnaire contained the same questions as the pre-interventional one, with additional questions to assess the power of the guide as a visual/written tool. Survey questions were grouped under the following headings: feelings of the fathers at the time of admission, knowledge about the NICU, knowledge about neonatal care inside the unit and follow-up, and knowledge about the guide. Face to face interview was selected to administer the questionnaire.

2.5. Family information guide

The guide was designed in a simple way to be used easily by the parents. It contained simple information in Arabic about the NICU and answers to questions commonly asked by parents, such as: safety of the baby, feeding in the NICU, medical care, investigations, various types of equipment, and the importance of follow-up after discharge. It also contained colored pictures about the field of the NICU.

2.6. Statistical analysis

Statistical analysis was performed using PASW Statistics version 18.0 (SPSS Inc., Chicago, IL, USA). Qualitative data were presented as frequencies and percentages. McNemar's χ^2 test was used for comparisons between responses before and after using the guide. Quantitative data were presented as means and standard deviations. The significance level was set at $p < 0.05$. Kruskal–Wallis test was used to study the associations between improvements in scores of different questions and demographic data. Mann–Whitney U test was used for pair-wise comparisons when the Kruskal–Wallis test was significant.

The multi-item scales measuring all constructs (constructs of the present study were: feelings of the parents, knowledge about the NICU, and knowledge about neonatal care inside the unit) were checked for reliability by determining Cronbach α ,

and an α value ≥ 0.60 was considered acceptable. Construct validity was evaluated through measuring convergent validity. Convergent validity was evaluated based on Spearman's rank order correlations; between child condition and parents' feelings, between parents' feelings and knowledge about the NICU, and between parents' feelings and knowledge about neonatal care inside the NICU. We hypothesized that parents of neonates with severe conditions would be more likely to be afraid and not be able to withstand the admission of their neonates. We also hypothesized that parents who were afraid and could not withstand the admission had no knowledge about the NICU and neonatal care inside the NICU.

3. Results

Of the 100 fathers participating in the study, 71% were workers, from urban areas (69%), with primary or middle level education (30% and 37%), and their mean age was 30.6 ± 6.6 years. Moreover, their neonates were mostly male (59%), with a mean age of 6.6 ± 4.7 days, and about half of them had moderate illness on admission. These demographic data are not shown here.

On studying the effect of the family information guide on fathers' feelings at time of admission, there was a significant increase in prevalence of parents who were feeling comfort after reading the guide (Table 1). Also, after reading the guide, there was a significant improvement in knowledge of parents regarding the NICU and neonatal care inside the unit (Table 2).

In questions about the guide in the post-interventional questionnaire, we reported that 90 parents (90%) stated that they fully understood (strongly agree) all information about the NICU. Ten parents (10%) stated that they agree with understanding information about the NICU. Also, 96 parents (96%) stated that they strongly agreed that the guide had a positive impact, and four parents (4%) stated that they agreed that the guide had a positive impact. All parents answered that they needed specific information about the condition of their babies and they gave feedback that the guide had enough information about the NICU.

Regarding the association between after-guide knowledge scores about the NICU and neonatal care inside the unit and

Table 2

Effect of family information guide on knowledge about NICU and neonatal care inside the unit.

Question	Strongly disagree	Disagree	Agree	Strongly agree	<i>p</i> *
1-Do you have information about NICU?					
Before guide	97	3	0	0	< 0.001
After guide	0	0	10	90	
2-Do you know the cause of admission?					
Before guide	67	33	0	0	< 0.001
After guide	0	0	10	90	
3-Do you know the ventilator & its role in treatment?					
Before guide	88	7	5	0	< 0.001
After guide	0	0	10	90	
4-Do you know phototherapy & its role in treatment?					
Before guide	70	18	6	6	< 0.001
After guide	0	0	10	90	
5-Do you know that the medical team is always available in the unit?					
Before guide	38	25	35	2	< 0.001
After guide	0	0	0	100	
6-Do you know that the neonate is regularly checked all over the day?					
Before guide	30	38	29	3	< 0.001
After guide	0	0	0	100	
7-Do you trust infection control in the NICU?					
Before guide	48	26	23	3	< 0.001
After guide	0	0	5	95	
8-Do you trust neonatal identification in the NICU?					
Before guide	53	28	17	2	< 0.001
After guide	0	0	7	93	
9- Do you know about neonatal feelings in the NICU?					
Before guide	51	44	4	1	< 0.001
After guide	0	0	0	100	
10- Do you know about neonatal hygiene in the NICU?					
Before guide	57	29	12	2	< 0.001
After guide	0	0	0	100	
11- Do you know that breast feeding is allowed?					
Before guide	51	44	4	1	< 0.001
After guide	0	0	0	100	
12-Do you know that you can check the neonate all over the day?					
Before guide	71	7	18	4	< 0.001
After guide	0	0	0	100	
13-Do you know the importance of follow up after discharge?					
Before guide	92	5	2	1	< 0.001
After guide	0	0	0	100	

**p* < 0.05 was statistically significant.

NICU = neonatal intensive care unit.

different variables, there was a significant association between improvement in after-guide knowledge scores about the NICU and educational level of parents. Also, there was a significant association between improvement in knowledge scores and neonatal condition but there was no significant difference between improvement in knowledge scores and residence and occupation of parents (Table 3). There was no significant association between improvement in after-guide knowledge scores about baby care and educational level, occupation of father, residence, or child's condition (Table 4).

Acceptable reliability values were found for different constructs of the survey. Cronbach α values ranged from 0.714 to 0.825, denoting good reliability of the questionnaire (Table 5).

In Table 6, all the correlations were positive and significant, denoting good convergent validity, as our hypotheses were verified by finding positive correlations. That is, parents of neonates with severe conditions were more likely to be afraid

Table 1

Effect of family information guide on fathers' feelings at time of admission to NICU.

Fathers' feelings	Before guide	After guide	<i>p</i> *
Feelings towards NICU at time of admission			
Comfort	1	91	< 0.001
Upset	0	9	
Afraid & tense	49	0	
Cannot withstand	50	0	
Fear of admitting the baby to NICU			
Strongly disagree (Not at all)	1	90	< 0.001
Disagree (No)	3	10	
Agree (Yes)	31	0	
Strongly agree (sure)	65	0	

**p* < 0.05 was statistically significant.

NICU = neonatal intensive care unit.

Table 3
Association between after-guide knowledge scores about NICU and different variables.

	Mean	SD	<i>p</i> *
Education level			
Illiterate	2.6	0.5	0.001
Primary	2.9	0.3	
Middle	3	0	
High	2.8	0.4	
Neonatal condition			
Mild	2.6	0.5	0.012
Moderate	2.9	0.3	
Severe	2.9	0.3	
Residence			
Urban	2.9	0.3	0.208
Rural	2.8	0.4	
Occupation			
Worker	2.8	0.4	0.269
Employee	3	0	
Professional	2.9	0.4	

* *p* < 0.05 was statistically significant.

Table 4
Association between after-guide knowledge scores about baby care and different variables.

	Mean	SD	<i>p</i> *
Education level			
Illiterate	2.3	1	0.078
Primary	2.6	0.6	
Middle	2.4	0.7	
High	1.9	0.8	
Neonatal condition			
Mild	2.5	0.7	0.196
Moderate	2.3	0.8	
Severe	1.9	1.1	
Residence			
Urban	2.5	0.7	0.208
Rural	2.3	1	
Occupation			
Worker	2.5	0.8	0.253
Employee	2.2	0.8	
Professional	2.3	0.8	

* *p* < 0.05 was statistically significant.

Table 5
Reliability analysis results (Cronbach α scores).

Constructs	Cronbach α
-Parents' feelings	0.714
-Knowledge about NICU	0.746
-Knowledge about neonatal care in the NICU	0.825

NICU = neonatal intensive care unit.

and had too little knowledge about the NICU and neonatal care inside the unit.

4. Discussion

Admission of an infant to the NICU is considered a stressful experience for parents.⁸ Charchuk and Simpson⁹ found that parents of an infant admitted to the NICU faced

Table 6
Results of Spearman's correlation coefficient for measuring convergent validity.

Items	Correlation coefficient range	<i>p</i> (range)*
-Child condition & parents' feelings	(0.672–0.701)	(0.001 to < 0.001)* (All significant)
-Parents' feelings & knowledge about NICU	(0.604–0.722)	(0.012 to < 0.001)* (All significant)
-Parents' feelings & knowledge about neonatal care in the NICU	(0.587–0.795)	(0.023 to < 0.001)* (All significant)

**p* < 0.05 was statistically significant.

NICU = neonatal intensive care unit.

challenges including access to information, disclosure about the diagnosis, treatment, and prognosis of their newborn. Parents of infants admitted to the NICU experienced high levels of distress compared to parents of healthy infants. Such experiences of distress are thought to be related to the NICU environment, as well as isolation from their baby.^{10,11} Results of this study also showed that parents of babies admitted to the NICU experienced high levels of stress and discomfort.

Patient health education has been shown to improve knowledge, psychological outcomes, and satisfaction. There are several methods by which healthcare professionals can educate parents including: print, audiovisual methods, demonstration, and verbal instruction.^{12,13} Specific verbal suggestions in combination with written information can lead to a greater acquisition of knowledge and skills,⁶ as one of the biggest drawbacks of providing education solely via verbal instructions is that parents often have difficulty remembering and understanding what is said.¹⁴ Thus, for more in-depth patient education, oral instruction alone is not likely to be as effective as other methods for delivering information.¹⁵

Written materials continue to be a cost-effective, easy intervention to increase patient education.¹⁴ A study of patients with acute chest pain showed that written information leaflets significantly decreased anxiety, facilitated patient–staff interactions, and increased satisfaction with patient care better than verbal instruction alone.¹⁶ In this study, we hypothesized that applying simple information about the NICU environment in the form of a written guide as a written/visual tool reduced bad ideas about the NICU and the number of questions asked frequently to doctors and nurses, in order to improve communication between them.

The simple, easily produced guide in the present study significantly improved comprehension by the fathers. Similar findings were reported by Azoulay et al⁷ who mentioned that using family information leaflets in the ICU for family members of the patients improved their comprehension. Therefore, use of the guide by fathers reduced the bad feelings about the NICU and improved knowledge about the NICU and neonatal care.

Regarding the feelings of the parents at the time of admission, parents always seek information to reduce the emotional impact of the admission of an infant to the NICU.¹⁷ This was confirmed by our results, as there was a significant decrease in the prevalence of parents who were afraid and tense and there was an increase in prevalence of parents who

were feeling comfort. Similarly, Azoulay et al⁷ reported that family information leaflets helped family members to decrease their stress.

Parents appreciate being informed immediately about the equipment and materials,^{18,19} which was confirmed by our results that showed that information about the unit that was given to fathers significantly improved their awareness. Parents also need information about their infant and his/her progress during the NICU stay.²⁰ There was a significant increase in prevalence of parents who had information about the role of the medical team inside the unit and infection control and identification for their baby and follow-up and baby personal care, after reading the guide. Similar findings were reported by Gray et al,¹⁸ who demonstrated that emerging communication technologies such as the internet and video conferencing can be successfully integrated into practice within a busy NICU and that they significantly improve family perception of care. In addition, the guide reflects a positive impact on the trust of fathers for infection control and baby identification in the unit.

Information seeking by parents is a way of engaging in the care of their infant,²¹ so there was frequently asked questions about: personal care of the baby and how he/she was feeding, if breast feeding was allowed, and if hygienic measures were implemented. We found that the guide increased awareness and fulfilled the needs of all fathers about that care. Similar findings were reported by Gray et al¹⁸ who mentioned that using technologies such as Baby Care Link can offer better coordination of care with nurses.

The guide helped all fathers in increasing their awareness about how to check their babies when they were admitted to the unit, which was a major stress for them, and gave them an idea about the importance of follow-up and its benefit for their baby.

After finishing the assessment of the effect of the guide on the included knowledge, we asked the fathers for their feedback about the guide itself. We found that the guide had a positive impact on psychological outcomes. Similar findings were reported by Azoulay et al,⁷ who mentioned that information helped family members to cope with their distress. These findings appear to be in accordance with many studies that demonstrated that the intervention increased parental support, met parental feelings of wellbeing, and increased parents' ability to provide care for their infant.^{22–24} Conner and Nelson²⁵ also described factors that contribute to parents' satisfaction in the NICU, which include assurance, caring communication, provision of consistent information, education, environmental follow-up care, appropriate pain management, and parental participation and proximity, as well as emotional, physical, and spiritual support.

However, improvement in after-guide knowledge scores about the NICU showed an association with different variables. There was a significant association between improvement in after-guide knowledge scores and educational levels of parents, and child's condition, but no significant association was found with occupation or residence.

There was no significant association between improvement in after-guide knowledge scores about baby care and level of education, occupation, residence, or baby's condition.

Finally, this study demonstrated an improvement in fathers' knowledge about the NICU as well as their satisfaction with the information received after the guide. Moreover, the improvement in satisfaction and knowledge changed their bad expectations about the unit, which was a major source of distress for them. The positive impact observed highlighted the importance of the availability of written information in Arabic for parents at the time of admission of their babies to the NICU, taking into consideration illiterate fathers who need verbal communication for explanation. This study represents a small contribution to that larger endeavor. We have only begun to learn how and to what extent written health education information can make a difference. Future studies are required to study the effect of other methods of communication such as videotapes and the internet on communication with parents, to include mothers in future studies, and study the effect of the guide on their knowledge and perceptions, and to reapply the guide in large studies.

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