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The Impact of Increasing the Frequency and Duration of Kangaroo Mother Care on Maternal Attachment and the Clinical Status of Premature Infants

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ABSTRACT

Premature birth is one of the most significant challenges of healthcare systems in the world and Iran. The problems resulted from Premature Infant Care, and the numerous complications that alter the evolution of infant have all great impact and the characteristics of individuals, families and societies. Findings of studies have indicated that skin-to-skin contact in the delivery unit from the first hour, and its persistence in the neonatal wards, and especially NICU has significant impacts on the physical and emotional improvement of infants. Examining various aspects and introducing approaches to quantitative and qualitative development of such types of care in hospitals and supporting clinical centers of premature infants is of great importance. The purpose of this study is to determine the impact of increasing the frequency and duration of kangaroo mother care on maternal anxiety, maternal attachment and the clinical status of premature infants. The study has a quasi-experimental design with a population consisted of 30 mothers and 30 infants obtained through convenient sampling method, and selected from eligible mothers and infants in the neonatal ward of Zahedan Social Security Hospital. The results indicated that the aforementioned intervention increases the maternal attachment and improves the clinical status of premature infants.

Keywords: Kangaroo Mother Care, KMC, attachment, Clinical status of premature infants

INTRODUCTION

Every year, about 20 million infants are born with lower expected weight, making premature birth one of the important challenges of the healthcare systems in the world and Iran. One of the indices of development of every country is its mortality rate. Since infant mortality consists two third of morality of children under five years, achieving the goals of healthcare would not be possible without directing special care to the health of infants and reduction of their infant rates [1]. Providing care for low-weight infants is a heavy burden on Social systems and community health [2].

Hospitalization of premature infants in the intensive care unit not only deprives the infant of motherly love, but also intensifies the anxiety of the parent [3]. Getting physical contact with the infant is important for both the mother and the infant. It has been proven that a premature infant requires same care provided for normal infants, i.e. they have to be loved, hugged and cared [4].

Attachment is the warm, intimate and stable relation between the mother and the child which is pleasant for both of them and facilitates the interaction of mother and infant. Researches have demonstrated that increase of attachment leads to more stable relationships, which in turn leads to reduced anxiety of the mother[5].

Skin contact of mothers and infants has many benefits for both the mother and the infant in terms of physiological, psychological, and clinical features. During the skin contact, contact, thermal and smell receptors could trigger the release of oxytocin in the mother. Oxytocin has anti-anxiety effects which could improve sense of confidence and comfort [6].

Recent studies have indicated that skin-to-skin contact in the delivery unit from the first hour, and its persistence in the neonatal wards, and especially ICU has significant impacts on the physical and emotional improvement of infants [2].

Kangaroo Mother Care is a type of skin-to-skin relation of mother with infant, in which the infant is placed on mother's chest [7]. Results indicate that this type of care leads to Fewer episodes of apnea and decreased need of oxygen by the infant. Moreover, the infants are more attached to their mothers, feel more secure and Less reactive to external bothering [8].

This healthcare measure has recently been highly regarded by the World Health Organization, and consequently the Ministry of health and clinical centers of the country and he province. There are Two methods for the execution of this healthcare measure: Continuous and intermittent [2]. Under the current conditions, the more prominent method in the country and the hospitals of the province is the intermittent one. The main purpose of this study is to find out whether increasing the frequency and duration of such care and directing it towards the continuous mode can also increase the effects on the maternal attachment to infant and improve the clinical status of premature infant (O₂ saturation has been selected as the factor of clinical status).

MATERIALS AND METHODS

This study is a quasi-experimental and interventional research conducted in 2015 (control group design and testing with pre-test, post-test). The sample population was selected from eligible mothers and infants eligible to be hospitalized in neonatal intensive care unit of Zahedan Social Security Hospital. The design of the study is demonstrated in table 1.

Table1: Research Diagram

Groups	Random Selection	Pre-test	Independent variable	Post-test
Experiment group	RE	T1	X	T2
Control group	RC	T1	-	T2

Statistical population of this experiment consisted of 30 preterm infants (32 to 37 weeks of age, birth weight of 1800 grams and above) with no congenital abnormalities or other serious disease (except for respiratory distress syndrome), and 30 mothers of age 18 to 35 years, with planned pregnancies of singletons, having 32 to 37 weeks age preterm infants with respiratory distress syndrome (on admission), with the ability to hold the baby, lack of mental or physical chronic disease and serious family issues.

Research tools

1. Maternal Postpartum Attachment Scale (MPAS): a self-report questionnaire which examines the relationship of mother and infant, and is filled by the mother. It was developed by Condon and (8) and translated to Persian by (10). It contains 19 terms and 3 sub-scales (attachment quality, lack of hostility and satisfaction from interaction). The internal consistency of this questionnaire was calculated to be 0.78 in the study of [9] and the range of score is 19 to 95. Test-retest reliability of the questionnaire from 2,4 and 32 weeks were respectively 0.86, 0.68, 0.48.
2. Tools for measuring and recording the clinical status of the infant (monitoring): including the proxies for O₂ Saturation, and respiratory rate

Data Collection Method

After obtaining consent the mothers and removing their ambiguities regarding the nature of this study and its interactions, samples were randomly selected and chronologically assigned to either groups of control and experiment.

In both of the groups, on the very first instance of determination of the clinical status in the preterm, and with the cooperation of the corresponding personnel of the evening shift of the hospital the period in which the unit is quieter, the mothers were first instructed about the Kangaroo Mother Care and its correct practice. Then, they were provided with proper conditions, including a comfort chair by the side of the incubator and a quiet environment, and then they did the process of care. After the first session, the infant was placed in his/her bed, and the questionnaires for anxiety and attachment were immediately dispatched to the mothers.

For the control group, in the second and third days after the start of period, the care was delivered with exact same constraints. Again, mothers were asked to fill the questionnaire, and the Kangaroo care continued until the dismissal of the infants.

Regarding the experiment group, which the researcher intended to increase its frequency and duration, Kangaroo care was delivered at least four times a day (in this period, the mothers are accommodated in special rooms and rest in their beds during the interval), 1 to 3 hours each (depending on the tolerance of the infant and desire of the mother). In addition to the first session, in the evening sessions of the second and the third day, after the mother care, the attachment questionnaires were filled by mother in the same conditions near the infant.

Regarding the parameter of the study for the clinical status of the premature infant, Oxygen Saturation in the Hemoglobin was controlled and measured by the researcher in the evening of days 1, 2 and 3, approximately 30 minutes after the kangaroo mother care. They were then compared for analysis.

Data Analysis

Table2: frequency of variables of mothers' age and infants' weight in the sample

Age of mother	Frequency (%)	Weight of the infant in grams	Frequency (%)
18-22	7 (23.3)	1800-2000	4 (13.3)
23-27	11 (36.7)	2000-2300	11 (36.7)
28-32	6 (20)	2300-2500	6 (20)
33-35	6 (20)	2500-2800	5 (16.7)
		>2800	4 (13.3)
Total	30 (100)	Total	30 (100)

Table3: Descriptive indices of research variables of mothers in two groups of control and experiment before and after intervention

Group		Freq.	Average	Standard deviation
Experiment	Pre-test attachment score	15	48.2667	6.72858
	Post-test attachment score	15	89.2400	6.10770
Control	Pre-test attachment score	15	50.1733	5.34943
	Post-test attachment score	15	78.9667	3.94329

Results from table 3 indicate that descriptive indices of research variables in two groups of control and experiment before and after the intervention shows that the average of research variable of the mothers (attachment) of the experiment group in the post-test is different from the ones in the pre-test; the scores for the post-test was higher than the pre-test (M=89.2400). Analysis of Covariance (ANCOVA) was used to compare the averages and to control the effect of pre-test.

Table4: adjusted Average and Standard error of research variables in both groups

Research variables	Group	Adjusted Average	Standard error
Attachment	Experiment	73.3533	3.37149
Attachment	Control	68.0800	3.44201

Table 5: Results of ANCOVA for 2nd Hypothesis

Source	Sum of squares	D.f.	Mean square	F	Probability
Pretest	4.868	1	4.868	0.0411	0.527
Group	213.300	1	213.300	17.990	0.000
Error	320.133	27	11.857		
Total	150558.970	30			

Hypothesis 2: increasing the duration and frequency of mother Kangaroo Care influences the attachment of the mother.

The results from table 4.8 indicate that the F-value for group effect (independent variable, training program) is equivalent to 17.990, and the differences between the averages for the control group and the experiment group are statistically significant ($P < 0.000$). In other words, the adjusted average of control group for mothers' attachment (M=68.0800) after the Training Program on the intervention was reported to be less than adjusted average of experiment group; hence, increasing the duration and frequency of mother Kangaroo Care influences the attachment of the mother.

Table 6: Results of ANCOVA for 3rd Hypothesis

Source	Sum of squares	D.f.	Mean square	F	Probability
Pretest	1.416	1	1.416	5.273	0.030
Group	6.003	1	6.003	22.354	0.000
Error	7.251	27	0.269		
Total	569.000	30			

Hypothesis 3: increasing the duration and frequency of mother Kangaroo Care influences O₂ Saturation of Hemoglobin as an index for the clinical status of the infants

The results from table 4.9 indicate that the F-value for group effect (independent variable, training program) is equivalent to 354.22, and the differences between the averages for the control group and the experiment group are statistically significant ($P < 0.000$). In other words, the adjusted average of control group for the percentage of O₂ Saturation of the infants as an index of infants' clinical status ($M = 68.0800$) after the Training Program on the intervention was reported to be less than adjusted average of experiment group; hence increasing the duration and frequency of mother Kangaroo Care influences O₂ Saturation of Hemoglobin as an index for the clinical status of the infants.

DISCUSSION AND CONCLUSION

Hypothesis 2: increasing the duration and frequency of mother Kangaroo Care influences the attachment of the mother.

Results from statistical analysis show that there is a significant difference between attachment scores in the pretest and posttest of mothers ($F = 17.990$, $P < 0.000$). Hence, results demonstrate that this intervention leads to increased attachment of mothers in the experiment group. Thus, the 2nd hypothesis suggesting the effect of increased frequency and duration of Mother Kangaroo care is verified. The results of this study are consistent with the findings of [1, 4, 9] and Gatvala, Saine and [10].

There was no study regarding the measurement of the effect of increased frequency and duration of Kangaroo care on the baby, but based on the Analysis, this intervention has higher effects on the attachment of the mother

Hypothesis 3: increasing the duration and frequency of mother Kangaroo Care influences O₂ Saturation of Hemoglobin as an index for the clinical status of the infants

Findings suggest the integrity of the 3rd Hypothesis and indicate that the increase of the duration and frequency of mother Kangaroo Care significantly influences O₂ Saturation of Hemoglobin as an index for the clinical status of the infants ($F = 354.22$, $P < 0.000$). The results are consistent with findings from [10-12].

CONCLUSION

Among the many extant and developing scientific methods leading to the reduced mortality rate of infants, and their increased healthcare, the effect of Mother Kangaroo Care has proven to be more than a simple clinical therapy or an alternative to therapeutic tools.

As it has been described, this method is based on the skin-to-skin contact between the mother and the infant [4].

The following are the advantages and effects of this care measure, especially compared to the incubator care:

- Better temperature control and metabolism, and maintaining of the temperature of the infant's body compared to the incubator.
- Reduction of infant problems, including breathing problems, infections, crying and vomiting.
- Positive impact on the senses (touch, hearing, taste, sight, smell) in contact with the mother.
- Improved growth and weight gain
- Positive psychological effect on the mother and infant, including maternal experience less stress, increased calmness and confidence and a sense of peace, comfort and love in the father.
- Reduced workload of staff need for additional staff, and the creation of family-oriented.
- Reduced infant mortality [8].

Evidently, with the returning of the mother to her home, there is a dip in the performance of the follow-up, an issue that fades the rather positive effects of this care method.

After the dismissal of infants from the hospitals, due to the lack of skill and experience in this care method, lack of support from the clinical staff or the presence of concerns and the probable lack of evident clinical improvement, families – and especially the mother who have the greatest role in this issue typically are less enthusiastic to follow-up this method, and may even relinquish their responsibility to the grandparents and other relatives.

According to the conducted studies, mothers with more expertise in kangaroo mother care, after being dismissed, have had less visits to clinics. Given the cultural conditions of the society, and especially the local society of Sistan and Baluchestan, mothers with more children counts and higher concerns, their return to home is coupled with household tasks, which might even include Knitting, needlework, parenting, hospitality, and even animal husbandry. The presence of the mother in the hospital and on the side of the premature infant who has gained some level of stability, and her kangaroo mother care creates comfort for the mother, which is beneficial for the process of care and gaining experience and skill, motive, and self-confidence to use them in the follow-up in her home. This period is ideal for increasing the frequency and duration of cares, the final results of which would be more on the side of the mother: comfort, attachment and satisfaction of the mother. In other words, the increased time spent for learning skill and gaining motives for the mothers of this region is equivalent to more comfort, satisfaction self-confidence, less anxiety, and better attachment and care, and thus the ultimate price of improved mutual relationship; these features all lead to the improvement of the clinical status of the premature infant.

In this study, we intended to lessen the problems and provide ideal clinical conditions for the infants by increasing the duration and frequency of kangaroo mother care, and consequently increasing the functionality of the mother during her presence in the hospital, the results of which were promising of our intents.

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