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The Comparative Effect of Multisensory Stimulation and Breast Milk on Intensity of Pain in Premature Infants during Retinopathy Screening Examination

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Abstract

Background

Eye examination for retinopathy of prematurity (ROP) examinations is a screening test which is among the painful procedures in neonatal care unit. The aim of this study was to investigate the effect of multisensory stimuli and breast milk on intensity of pain in premature infants during eye examination.

Materials and Methods: This study is a randomized clinical trial. Ninety premature infants in Shahid Sadoughi hospital of Yazd, Iran, were randomly divided into 3 groups included: two intervention groups (1-multisensory stimulation (30 infants), 2-the recipient of the mother's breast milk (30 infants), and control group (30 infants) who received the usual care of the ward. In this study, pain index score was recorded at 6 times based on Premature Infant Pain Profile (PIPP). Data were analyzed using SPSS software version 20.0.

Results: The mean pain score during the eye examination in the control group was significantly higher than two intervention groups ($p<0.05$). Both sensory stimulation and breast milk intervention groups reduced the pain score, but the sensory stimulation group reached the baseline score earlier than the breast milk group, so that in 1.5 minutes after the second eye examination, there was a significant difference between the pain scores of the two intervention groups ($p <0.05$).

Conclusion

According to the results of this study, multisensory stimulation and breast milk both can be used to reduce pain in preterm infants during ROP examinations. Although the effect of multisensory stimulation was slightly greater, breast milk could be a good alternative to a multisensory stimulation because it is a natural safe and effective analgesic at no cost.

Key Words: Breast Milk, Pain, Premature Infant, Multisensory Stimulation.

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1- INTRODUCTION

Every year, 15 million premature babies are born all over the world, which accounts for more than 10 % of all babies born around the world (1). Iran is among the regions with a high prevalence of premature labor, where 5,000 babies are born daily, about 12% of whom are premature (2). Infants who are born preterm are exposed to multiple health disorders, lack of their timely treatment and care will affect their survival and even their future, if they survive, and will require prompt and effective medical action; one of these disorders is retinopathy of prematurity (ROP) (3). The incidence of this disorder in the countries of the world is reported to be 14.4 - 47.2 percent (4). Premature infants born less than 30 weeks or weighing less than 1500 grams and infants weighing 1,500 to 2000 grams older than 30 weeks with a period of unstable clinical conditions require retinopathy screening examinations (5).

In these infants, the growth and development of retinal blood vessels is not completed, and the evolutionary process of the retina takes place after birth in an unstable environment with high oxygen. Delayed vascularity has led to abnormal blood vessels that are unable to supply enough oxygen to the retina; this disorder can lead to retinal detachment and blindness, if not diagnosed and treated in time (6, 7). Retinopathy screening should be performed 4-6 weeks after birth to diagnose the disorder early (5). These examinations by the International Evidence-Based Pain Group are on the list of painful procedures in the neonatal intensive care unit (8). Preventing pain is expected of parents and is not only morally important, but it has been shown that repeated pain in vulnerable neonates can lead to emotional, behavioral, learning, neuroanatomical disabilities and changes in physiological parameters (7). Many non-pharmacological methods are used today to relieve and control pain. These techniques are safe, non-invasive, low-cost, and economical methods that fall within the framework of independent nursing practice (9, 10). One of these methods is the use of multi-sensory stimulation. These stimulations include a range of non-pharmacological methods, including gentle limb massage, soothing sound, eye contact with the mother, the use of soothing scents, and sucking on the pacifier (with or without sucrose). This appears to be a good alternative to pain relief instead of pharmacological interventions (11-14). Another non-pharmacological method is the use of breast milk as an analgesic. Breast milk contains about 7% lactose, which can be an alternative to sucrose in reducing pain (15). Some researchers have shown that infants recall memories of breastfeeding by recognizing the taste of breast milk.

Recalling communication and contact with the mother, along with the pleasant and sweet taste of milk, reduces physiological and behavioral responses to painful stimuli (15). In a study of 14 studies conducted between 2005 and 2015 with the aim of finding the best way to reduce neonatal pain during a retinopathy examination, the researcher concluded that not all interventions reduced pain significantly in neonates during eye examinations. The researcher suggested that further research be conducted to evaluate and study strategies that are more effective in reducing pain in a non-pharmacological manner and that the path to pain in these examinations be examined (16). The results of some studies showed that the multisensory stimulation program can be used as a solution to reduce pain and physiological changes in infants during eye examinations (11-14, 17). Considering that no study has been conducted to compare multisensory stimulation with other methods in reducing pain caused by examinations, and considering that breast

milk is a natural, painless and inexpensive analgesic and should not be paid for, the researchers aimed to investigate the effect of multi-sensory stimulation and breast milk alone and compare the two methods on the severity of premature infant pain during an eye exam to screen for premature retinopathy. It is hoped that the results will be able to improve the recovery of infants and the performance of nurses in the prevention of pain through reducing the pain of retinopathy examinations.

2- MATERIALS AND METHODS

2-1. Study design and population

The present study is a three-group randomized clinical trial conducted on premature infants admitted to the intensive care unit of Yazd's Shahid Sadoughi Hospital, Iran, who required retinopathy screening. In this study, three groups were considered, including two intervention groups: 1. Multisensory stimulation, 2.Mother's breast milk and 3. Control group. Considering the significant level of 5% and the test power of 80% and the standard deviation (SD) value: 3.1, and according to the results of a similar article (17), and to achieve a significant difference of at least one unit in the average pain score in groups, 27 people were needed in each group using the following equation, which, included a 10% drop. There were 30 people in each group and in total 90 people were selected based on the target method and then participants were randomly assigned to one of the three study groups enrolled in the study:

$$n = \frac{\left(z\frac{\alpha}{2} + z_{\beta}\right) 2 \times 2s^2}{(x1 - x2)2}$$

Due to the fact that the retinopathy screening examination was performed three days a week, and since the distribution of infants in three groups is completely random, thus, the first week, the first day the random examination (between the three groups in the envelope containing No. 1 (multi-sensory stimulation intervention group), No. 2 (mother's breast milk intervention), and No. 3 (control group) was performed by a person by a person who was blinded to the research, and one of the groups was selected and examined. On the second day, one group was selected from the other two groups as above and on the third day, the remaining group was studied and the researcher continued this until the required limit for the sample size of the research was completed. The sampling started on June23, 2018 and ended on January 9, 2019. Further, the information was not shared due to the fact that the mothers of the infants were not meeting each other at the same time.

2-2. Inclusion and exclusion criteria

Criteria for infants to enter the study include: 1. Introduction by their treating physician, 2. Infants whose mothers were present, 3. premature infants born at 32 weeks and 6 days or younger or weighing 1500 grams or less at birth, infants who are four weeks old weighing 1,500 to 2,000 grams, with a period of unstable clinical conditions. 4. The baby should be examined for the first time (not having previous experience), 5. Infants who were not fed in the past one hour, and 6. The baby should be calm and conscious. The criteria for infants' exclusion from the study are: 1. Having a history of surgery and cardiopulmonary resuscitation, Intraventricular hemorrhage, 2. Apgar 5 minutes less than 6, 3. Prescribing analgesics and sleeping medicine for the infant in the last 24 hours, 4. The infants who had needed ventilation with positive pressure and those who had been connected to the endotracheal tube. 5. Having abnormalities and problems of the nervous, cardiac and respiratory systems, and 6. Having a food prohibition. Infants who had apnea, seizures, and

cardiopulmonary resuscitation during the examination were also excluded from the study.

2-3. Methods

First, eligible infants were selected based on the study including and excluding criteria. Then, the researcher provided the necessary explanations about the research objectives to the infant's mother face to face. Premature infants were randomly divided into three groups, including two groups of multisensory stimuli intervention and breast milk, and a control group. All infants were in almost the same environmental conditions (light, temperature, and noise). For all infants, the pulse oximetry probe was fixed evenly on the right wrist with anti-allergy tape. No intervention was made in the control group, and the baby received the usual care of the ward, including incubator care and newborn individualized developmental care and assessment program (NIDCAP) which was done by mothers and staff as usual, and unplanned. Breastfeeding was not done one hour before the examination, like infants in both intervention groups. Traditionally, for all neonates before the examination one drop of tetracycline sterile eye drop 0.5% was used for each eye, in order to reduce the pain. And this was considered as standard care for all three groups. Pain assessment was performed 6 times (30 seconds before the start of the intervention, 30 seconds before the intervention began, from the beginning of the first eye examination for 30 seconds, from the start of the second eye examination for 30 seconds, from the end of the examination for 30 seconds, one minute and thirty seconds after the end of the examination for 30 seconds, and 5 minutes after the end of the examination).Three trained nurses were assisted simultaneously to record facial posture, heartbeat, and arterial oxygen saturation. To determine the reliability of the observed changes by observers, the "reliability between evaluators" method was used on 10 infants and was confirmed by the Intra-class correlation coefficient (ICC) between 0.6-1. Examination for retinopathy of prematurity (ROP) in all groups was done by the same ophthalmologist. In this study, individuals were blinded to groups to record physiological changes, facial changes, and behavior. To increase the validity of the study statistics, the consultant, examining physician and the nursing expert responsible for immobilizing the baby during the examination were also blind to the study **(Figure. 1)**.

2-4. Measuring tool

The data collection tools in this study include: 1- Demographic specification form (gender, weight at birth, weight at examination, gestational and chronological age, 2- PIPP or pain assessment profile for premature and term infants to determine pain score. PIPP is a standard and reliable tool for assessing pain in infants and has 7 indicators: 3-Indicators related to changes in the infant's face (eyebrows being convex, eyes being squeezed and grooves of laughter line), two indicators related to physiological responses (changes in arterial oxygen saturation and heart rate changes), and two indicators related to the infant's baseline status, including gestational age) 0=term, 1= 32-36, 2= 28-31, and 3= 26-27 weeks), and basic behavioral status (active awake, quiet awake, active asleep, quiet asleep).The gestational age recorded by the obstetrician or gynecologist was extracted from the neonatal record. The score assigned to each indicator is a score between 0-3 and the total score of the index is 0-21 (17). To get a pain score, first the facial condition, heart rate and oxygen saturation of the arterial blood are added together. If the score is above zero, the basic behavior score and fetal age will be added to it. However, if the sum of the three scores was zero, the basic behavior

score and fetal age would be excluded. This profile is the most reliable and valid tool available to assess pain in clinical centers and its validity has been confirmed (18). This tool has been used repeatedly in studies in Iran. The reliability of the tool was estimated by the reliability method of the evaluators with the Spearman correlation coefficient (r = 89%) (19-21).

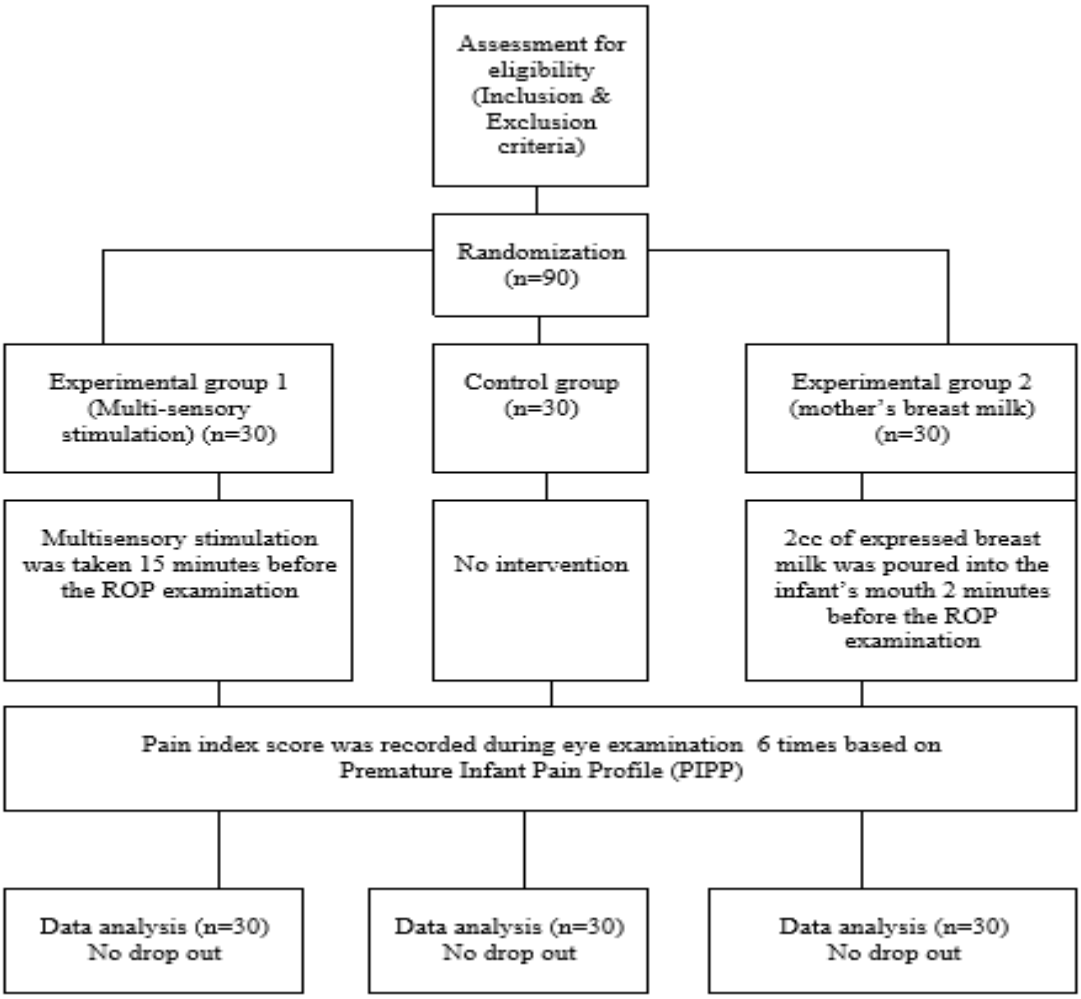

Fig1: Flowchart diagram.

2-5. Intervention

In the Multi-sensory stimulation intervention group, the baby was placed in the flexed fetal position so that the baby could move easily. After stabilizing the baby's condition planned multi-sensory stimulation care was performed, including olfactory, auditory, taste, visual, and tactile stimulation; while performing the interventions was taught to mothers by the researcher. To stimulate vision 15 minutes before the start of the examination until the start of the examination, the infant's mother looked closely at the infant's face so that she could attract the baby's attention. To stimulate the tactile sensation, the mother gently caressed the baby's face along with upper and lower limbs, 15 minutes before the examination. To stimulate hearing, and the infant's mother spoke to the baby slowly and evenly in the form of verbal caresses 15 minutes before the start of the

examination; in such a way that the baby can hear the mother's voice well. To stimulate olfactory, the researcher attached gauze soaked in 5 drops of 2% lavender essence oil on the right shoulder to the baby's clothes 15 minutes before the start of the examination. This attachment was done by anti-allergy tape and before the examination began, it was removed from the clothes. To stimulate the taste, 33% glucose in the amount of one ml was used 2 minutes before the start of the examination. In this way the glucose solution prepared by the researcher was drawn into the syringe and the needleless syringe was placed in the baby's mouth and emptied into the baby's mouth during 30 seconds with gentle movements along with the infant's sucking. In the mother's breast milk intervention group (the mother's breast milk group), the mother was asked to wash her hands and express the fresh milk and pour it into the cups existed in the ward that were packed and given to the mother two minutes before the start of the examination. Two ml of the mother's fresh milk was drawn into the syringe by the researcher, gently placed in the baby's mouth, and emptied into the baby's mouth during 30 seconds with gentle movements along with the baby's sucking.

2-6. Ethical consideration

In order to observe ethical considerations, a written consent was obtained in two versions from the parents for the entry of their baby in this research. Mothers were assured that their information would remain confidential and they would be able to leave the study at any time. The present study has an ethical license with the code IR.SSU.REC.1397.018 from the ethics committee of Shahid Sadoughi University of Medical Sciences in Yazd and the clinical trial registration number: IRCT20180310039023N1.

2-7. Data Analyses

After collecting the data and recording it in the SPSS software version 20.0, the normality of the data was assessed by skewness and kurtosis criteria and due to the fact that the absolute magnitude of skewness and kurtosis sizes of the studied data were less than the allowable limit of 2, the data had a normal distribution. Therefore, data analysis was performed through descriptive statistics including frequency and percentage for Qualitative data (i.e., sex), mean and standard deviation for quantitative data (gestational age, chronological age, weight, pain score), and inferential statistics. Comparison between Qualitative data was performed by chi square and comparison between quantitative data was done using ANOVA test in three groups of study. Post hoc Tukeys' test was done to find out which specific groups' means of pain score (compared with each other) are different. A repeated one way ANOVAs was used for testing the differences of mean scores of pain in serial measurement across three groups. P-value less than 0.05 was considered statistically significant

3- RESULTS

The results of the present study showed that there were 19 boys (63.3%), and 11 girls (36.7%) in the multi-sensory stimuli intervention group and breast milk intervention group and 16 boys (53.3%), and 14 girls (46.7%) in the control group. The results of Kai-Square test showed that there was no significant difference between the three groups in terms of gender variable (P = 0.05). The variance analysis test also showed that three groups were homogeneous in terms of fetal age, chronological age, birth weight and weight at the time of examination (**Table. 1**).

Table-1: Comparison of the intervention and control groups in terms of demographic characteristics.

Variables	Groups	Mean ± SD	P-value
Fetal age (week)	Multi-sensory stimulation	30.2 ± 1.1	0.33
	Breast milk	30.1 ± 8.6	
	Control	30.2 ± 8.6	
Chronological age (day)	Multi-sensory stimulation	30.2 ± 7.8	0.52
	Breast milk	30.1 ± 1.8	
	Control	30.1 ± 2	
Birth weight (gram)	Multi-sensory stimulation	1329.341 ± 3.4	0.15
	Breast milk	1452.525 ± 6.2	
	Control	1555.459 ± 3.4	
Weight during examination (gram)	Multi-sensory stimulation	1596.343 ± 8.5	0.06
	Breast milk	464 ± 1823.6	
	Control	507 ± 1847	

*ANOVA test, SD: Standard deviation.

The results of the analysis of variance test (one-way ANOVA) showed that there was no statistically significant difference between the mean score of pain in the three groups in the stage before the start of the eye examination. During the eye examination, there was an increase in pain scores in three groups. During the first and second eye examinations, a significant statistical difference was observed between the mean pain scores in the three groups (P= 0.001) (**Table.2**). According to the results of the Post hoc Tukey test, the pain score during the first eye examination in the control group was significantly higher than the Multi-sensory stimulation and mother's breast milk intervention groups (P = 0.001). But there was no significant difference between the two intervention groups (P = 0.53). The pain score during the second eye examination in the control group was significantly higher than the Multi-sensory stimulation and mother's breast milk intervention groups (P = 0.01, P= 0.001, respectively). There was also a significant difference between the two intervention groups (P = 0.01), as the mean pain score of the intervention group (1) was lower than the intervention (2). At 30 seconds after the end of the eye examination, a decrease in the mean pain score was observed and there was a statistically significant difference between the mean pain score in the three groups (P= 0.001). At 1.5 minutes after the end of the eye examination, the average pain score continued to decline in all groups. And a statistically significant difference was observed between the groups (P=0.001). At 5 minutes after the end of the eye examination, there was no statistically significant difference between the mean pain scores of the groups (**Table.2**). According to the results of the Post hoc Tukey test, the average of pain score in 30 seconds after the end of the eye examination in the control group was still significantly higher than the Multi-sensory stimulation and mother's breast milk intervention groups (P = 0.001). However, no significant difference was observed between the two intervention groups (P=0.09). At 1.5 minutes after the end of the eye examination, the difference

between the control group and the two intervention groups was significant (P=0.001); and there was a significant difference between the two intervention groups (P = 0.01). Five minutes after the end of the eye examination, there was no significant difference between the pain scores of the three groups (P> 0.05).

Table-2: Comparison of mean pain score in the three groups studied at the time of measurement.

Stage	Intervention (1)	Intervention (2)	Control	P-value
	Mean ± SD	Mean ± SD	Mean ± SD	
Before eye examination	0.3 ± 0.9	0.5 ± 1.3	0.8 ± 1.5	0.29
During the first eye examination	8.2 ± 0.8	8.6 ± 1.1	10.2 ± 1.5	0.001
During the second eye examination	11.1 ± 1.2	12.1 ± 1.6	13.2 ± 1.3	0.001
30 seconds after the end of the eye examination	6.1 ± 1.8	7.07 ± 1.9	9.3 ± 1.2	0.001
1.5 minutes after the end of the eye examination	0.8 ± 1.8	2.2 ± 2.06	5.9 ± 1.9	0.001
5 minutes after the end of the eye examination	0.6 ±1.8	0.1 ± 5.3	1.1 ± 3.9	0.12

* ANOVA test, SD: Standard deviation.

According to **Figure.2**, the mean pain score in all three groups had an increasing trend until the end of the second eye examination and then a decreasing trend. The results of the statistical ANOVA with repeated measurements showed that regardless of the type of group the changes in the mean pain score over time were significant. Also, the trend of its changes between the studied groups has been different over time (P = 0.001) (**Table. 3**). The ANOVA test with repeated measurements showed that the trend of changes in the mean score of pain had a statistically significant difference between the three groups during the study, as in the Multi-sensory stimulation intervention group compared to the other two groups, there was less increase in the mean pain score until the end of the eye examination; there was also a further decrease in the average pain score of Multi-sensory stimulation group after the end of the eye examination (P<0.001).

Table-3: Time effect and the interaction of time and groups on changes in mean pain score.

Effects	F	P-value
Time	948	0.001
Time and group interaction	10.9	0.001
Comparison of total times in groups	61.16	0.001

* ANOVA with repeated measures.

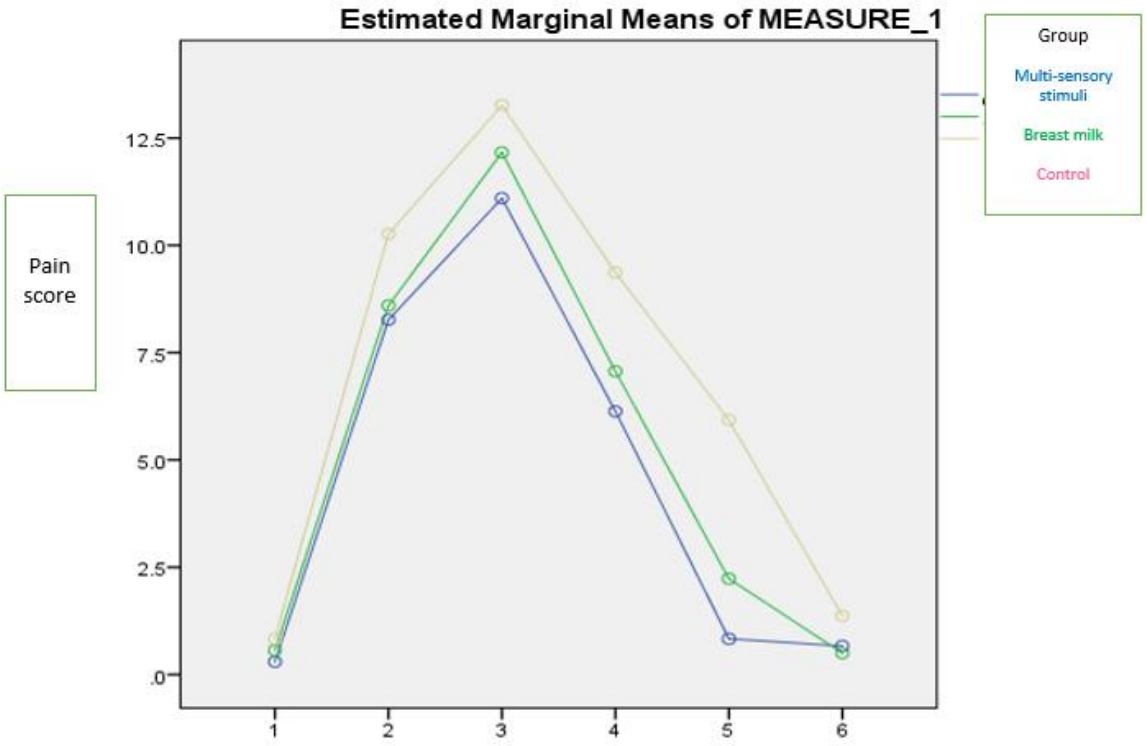

Fig.2: The trend of changes in the mean pain index in the six stages of evaluation in the studied groups.

4- DISCUSSION

The present study aimed to compare the effect of multi-sensory stimuli and breast milk on pain intensity in premature infants on retinopathy screening. According to the findings of the present study, there was no statistically significant difference between Multi-sensory stimulation and mother's breast milk intervention and control groups in terms of gestational and chronological age, birth weight, weight at examination and the gender of the baby, and the groups were homogeneous (P> 0.05). According to the findings of the present study, during the first and second eye examinations, the pain score in all three groups had an increasing trend. As the intensity of pain in all three groups reached its maximum during the second eye examination. The pain scores of all three groups were in the mean range (6-12, total score 21) during the eye examination and 30 seconds later. However, the pain score in the control group during the second eye examination was 13.2 $\pm$ 1.3 (total score 21), which was in the range of severe pain; the mean pain score in the control group was significantly higher than other groups. In the next stages of examinations, the mean scores of pain were declining in all three groups, and this reduction was significantly greater in the two intervention groups than in the control group. Moreover, 5 minutes after the eye examination, the pain score in all three groups returned to baseline. Therefore, there was no significant difference among the three groups. A study by Daley et al. in Turkey (2014) aimed to investigate the effect of sucrose and non-nutritional sucking on pain scores from eye examinations in premature infants. The results of their study showed that the pain score during the eye examination reached its maximum and it was 13.7±2.1 in the intervention group, and 16.4 ±1.8 in the control group (22). In the study of Taplak

and Erdem, which was conducted to compare the breast milk and sucrose on the reduction of neonatal pain during the retinopathy examination of premature infants, the pain score during eye intervention reached its highest level, which was 16.2±6.04 in breast milk intervention group and 15.58± 2.02 in the sucrose intervention group and 18.88 ± 1, 6 in the control group (23). According to a study by Rosalie et al. (2014) aiming to evaluate the effectiveness of breast milk in reducing infant pain during eye examinations for retinopathy screening, the pain score was maximized during eye intervention, and it was (12.7 ± 16) in the case group and (15.5 ±1.7) in the control group (24). The results of these studies are consistent with the present study. In a study by Zeraatie et al., which was performed to determine the effect of multi-sensory stimuli on premature infants during retinopathy, the results showed that the pain score in the intervention and control group before the eye examination was not statistically significant.

During the first and second eye examinations, the pain score in both groups continued to increase, however, this increase in the control group was significantly higher than the intervention group. There was a reduction in pain at all times after the examination. There was also a significant difference between the two groups at all stages in terms of pain intensity (P= 0.001). Thus, the results of this study are consistent with the present study. Except that in the present study, the pain score returned to baseline after 5 minutes, but in Zeraatie et al.'s study, the pain score returned to baseline after two minutes (17). A study by Bellieni et al. (2002) was carried out aiming to determine the effect of multi-sensory stimulation on the blood test pain from heel in term infants, which is consistent with the present study in terms of the effect of multisensory stimuli on pain intensity (25). Multi-sensory stimulation is likely to reduce pain in infants by inhibiting or reducing painful impulses by the posterior horn of the spinal cord according to the gate control theory of pain (11). Marsh et al. used local anesthesia to reduce the pain of retinopathy screening in premature infants. The results of their study also showed that with the beginning of the eye examination, a significant increase in pain score was created in both groups. Yet the rate of the so-called increase in the intervention group was significantly lower than the control group. After 5 minutes from the end of the eye examination, the pain score in both groups returned to baseline, which is consistent with the present study (26). The results of Taplak and Erdem's study showed that the average pain in the intervention groups (breast milk group and sucrose group) was lower than the control group. Though there was no significant difference between the two intervention groups in terms of pain rate. However, the return of baseline changes in the breast milk intervention group was faster than in the sucrose-receiving group (23). A study by Rosali et al. (2014) also showed a significant reduction in the severity of pain during and after retinopathy examination in the intervention group of breast milk compared to the control group (24).

Thus, the results of these two studies are consistent with the present study. Breast milk, which contains about 7% lactose, can be effective in reducing pain. However, Gray et al. stated that the result of some studies have shown that the analgesic effect of breast milk is due to the baby's skin contact with the mother (27). But others have suggested that breast milk may reduce physiological responses to painful stimuli in relation to memories of breastfeeding (28). The use of breast milk, especially in infants whose mothers are unable to attend to their baby's bed (due to hospitalization or labor pains, etc.) is

beneficial. Breast milk, and especially colostrum, has less sugar than sucrose solutions. Some studies have suggested that breast milk is more effective in reducing pain than sugar solutions (15). Therefore, this analgesic effect cannot be simply related to the sweet taste of breast milk, and there are definitely other factors influencing this process that are still unknown. It can be said that by breastfeeding and through experiencing the same taste and remembering the experience of breastfeeding, it is possible to help reduce the feeling of pain during painful examinations. In this regard, studies have shown that breast milk has no effect on reducing infant pain, which is not in line with the results of the present study.

In a review entitled "The Best Effective Steps to Reduce Neonatal Eye Examination Pain", Francis stated that the results of some studies have shown that breast milk has no effect on reducing neonatal pain (16). Also, Bilgen et al. (2001) showed that breast milk does not reduce the pain caused by heel blood test in infants. In this study, crying time and behavioral criteria of pain were used (29), the contradiction in the results of the studies is probably due to differences in the procedure, pain measuring instruments, samples studied and the type of painful procedure. Therefore, researchers suggest further studies on the effect of breast milk and its effective volume in reducing infant pain alone or in combination with other non-pharmacological methods of pain (30). In all studies that were reviewed, the pain score at the pre-examination stage did not differ significantly between groups (12-17, 23, 26). With the start of the eye examination and the placement of the speculum in the eye, the pain score increased, and this increase in the control group was usually higher than the other groups. At the end of the eye examination, the process of increasing the pain score stopped and began to decrease and returned to its baseline after 2 to 5 minutes. However, the methods used to control pain, the duration of the eye examination, the type of eye examination, and the pain assessment tool in different studies have led to differences in their results. It is important to note that no study was found to compare the effect of multisensory stimuli and breast milk on neonatal pain. Therefore, studies have been mentioned which have been performed separately in the context of the effect of breast milk and multisensory stimuli on the severity of pain during retinopathy screening examination in infants or they have been compared with other methods.

One of the limitations of the present study was the lack of complete control over the mothers of the control group. It was possible for the mother to take special care of the baby by singing lullabies, massaging, and making eye contact. It can be said that since these proceedings are not considered as a set of interventions, it has not interfered in this research. Evaluating the effect of multi-sensory stimulation and breast milk simultaneously on reducing the pain of retinopathy screening and comparing it with the performance of each one alone is suggested for future studies, as well as other studies on the effect of multi-sensory stimuli and breast milk on other variables such as infant weight gain, besides other painful interventions in infants.

According to the results of this study, multisensory stimulation and breast milk both can be used to reduce pain in preterm infants during ROP examinations. Although the effect of multisensory stimulation was slightly greater, breast milk could be a good alternative to a multisensory stimulation because it is a natural, safe and effective analgesic at no cost. Also, in the absence of the mother, expressed breast milk can have analgesic effects on the baby.

5- CONCLUSION

Based on the results, both sensory stimulation and breast milk intervention groups reduced the pain score, so multisensory stimulation and breast milk both can be used to reduce pain in preterm infants during ROP examinations. Although the effect of multisensory stimulation was slightly greater, breast milk could be a good alternative to a multisensory stimulation because it is a natural safe and effective analgesic at no cost.

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7- CONFLICT OF INTEREST: None.

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