

IDENTIFICATION OF FACTORS ASSOCIATED WITH THE USE OF PACIFIERS IN CHILDREN

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Abstract:

Background: A pacifier is a rubber, plastic or silicone nipple given to the baby on sucking. In its standard appearance, it has a nipple, a mouth shield, and handle. Most children have a strong suction reaction. Some children, even suck thumb or fingers before their birth. Beyond nutrition, suction is often soothing, calming effect. There are many factors associated with using a pacifier such as; help to put the baby to sleep, calm the child when disturbed / irritable, wake up from nap / sleep, ride the car / transport, keep the child comfortable and calm, prevent the child from sucking thumb, school / social environment, calming the baby when teething, it reduces the risk of the sudden infant distress syndrome (SIDS), and cultural issue. **Aim:** To identify factors associated with the use of pacifiers in children. **Methods:** A descriptive design was used. **Population & Setting:** The target population of this study consisted of 52 mothers of children who coming at Emtidad Nasir primary health care center - Khartoum for vaccination during the study period. **Tools:** Structured Interviewing Questionnaire was used to collect the required data. **The results:** Most of studied sample were male children (80.8%) and their age less than 6 months (80.8) equally. Mothers level of education fewer of them were university (21.1%), the majority of mothers aged < 20 years old (59.6). Total factors related to the child (e.g. First born, breastfed infant, end of the pacifier, decreased weight, and breastfed in the first hour after birth) mean score and SD were 7.64±2.377. While the total factors related to the mothers (e.g. primigravida, cultural issues, have uncertainty about ability to breastfeed and difficulty in breastfeeding, nervousness and impatience, the pacifier is convenient for the mother, stop crying of a baby, didn't know believe that pacifier uses impacts speech production, mother not healthy) mean score and SD were 11.18±3.569. **Conclusion:** The current study concludes that the children using a pacifier were significantly correlated with child if he/she is first born, breastfed infant, the child doesn't end the use of the pacifier, decrease in child weight, the initial feeding is formula, mothers primigravida, mothers uncertainty about her ability to breastfeed and difficult in breast feeding, mother did not know the effect of using a pacifier on her children, and whom advised the mother to give her child a pacifier. **Recommendation:** conduct of health education programs for mother in all health care facilities about benefit and risk regarding using a pacifier for their children.

Keywords: Associated factors; Children; Use of Pacifiers

Introduction:

Breastfeeding is known to be the ideal form of infant feeding, not only because of its direct nutritional benefits to the infant, but also for the prevention of many other physiological benefits of the infant and mother [1].

The Canadian Pediatric Society and the American Academy of Pediatrics recommend exclusive breastfeeding for the first six months of healthy infant life. After that period, additional food items should be introduced, and breastfeeding can be continued as a complementary source of

food. Babies have a strong sucking reaction that helps to breastfeed. The sucking process is also found to be useful in calming children. In one Canadian study, more than 80% of parents use pacifiers for their children. However, in recent years the "nipple confusion" was suspected between the breast, bottle, and pacifier [2].

In 2005 the American Academy of Pediatrics recommended that caregivers should provide infants between one and six months of sucker (doll, soothing, Pinky) when they put them to sleep. The recommendation was based on studies (De-Kun et al., 2005; Fleming et al., 1999; Arnestad, Andersen & Rognum, 1997; Fleming et al., 1996; Hauck et al., 2003) showing pacifier use is associated with decreased risk of sudden infant death syndrome (SIDS). Pacifier use also mitigates the SIDS risk associated with soft bedding and prone sleeping position (Task Force on Sudden Infant Death Syndrome (2005) [3].

Sucking is an important milestone for every newborn to master to ensure exclusive breastfeeding after birth, and also contributes to self-regulating behavior and bonding. Non-nutritive absorption, or non-feed sucking, is a prelude to food absorption and carries various physiological benefits including improved digestion, behavior regulation, pain management, and aspiration prevention. In addition, the American Academy of Pediatrics published recommendations on the use of pacifiers in healthy infants associated with reducing the risk of Sudden Infant Death Syndrome. The use of pacifiers is an old practice, but often becomes a point of discussion when parents and professionals aim to protect and encourage breastfeeding as it is better suited for infant care [4].

The American Academy of Pediatrics recommends that parents consider using a sucker for their babies at bedtime and

sleep. However, there has been concern that the use of a pacifier on a large scale may have adverse effects with regard to the period of breastfeeding, the application of dental malocclusion, and infections [5]. It is estimated that two thirds of infants received bottles and lactation feeds during the first year of life. However, the use of these tools can affect breastfeeding and stimulate change in children's health [6].

An increase in pacifier- and baby bottle-sucking habits have been observed, as evidenced by a prevalence of 75% to 79% in industrialized western countries in recent decades. However, sucking habits are rarely observed in places like Tanzania and Zimbabwe, and when they occur, typically psychological disturbances are among the causes. Among the Inuit Native American peoples, sucking habits are practically nonexistent [7].

As early as the Neolithic (10,000 BC), some form of oral organ was used to control the crying of children. The flippers have evolved through many physical stages from bone, coral, ivory or cloth with natural or synthetic rubber recently. Alcohol, opium, food and sucrose were also used along with pacifiers to pacify infants or provide accommodation. The use of pacifiers is widespread, ranging from 63% to 84% in infants and children up to the age of 6 years. At an estimated cost of \$ 3-5 per pacifier, along with the US birth rate of about 4 million infants a year, assuming an 80% prevalence, the pacifier industry generates an estimated \$ 9.6-16 million a year from a sales sucker. This is a gross underestimation, since it is assumed that each baby uses only one pacifier [8].

The pacifiers are usually considered the children of thumb sucking to be the comforts and security of children while growing up. Children often start using a pacifier when their caregivers give them as a way to calm the child down from crying

or discomfort. This non-food method often helps the caregiver more than the child [9]. The performance of a sucker to stimulate (non-nutritive sucking) and use by children represents a cultural phenomenon developed on the basis of the process of assimilating the beliefs and practices created by previous generations. However, offering a controversial sucker among health professionals, who may recommend or not recommend its use is also based on personal experiences with cultural impact [10]. The use of pacifiers is increasingly spreading in various modern cultures, recommended recently since sucking pacifier accompanied by tranquility on children, reduces crying, improves sleep, has analgesic effects, partially provides the need for suction, reduces the risk of sudden death in the first 6 months of Life. Furthermore, most evidence does not support any negative relationship between the use of a pacifier and the duration of breastfeeding or individuality [11].

Breast milk is superior to infant formula. Ten steps to success in breastfeeding, a document developed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), specifically indicate that artificial nipples and pacifiers should not be given to breastfeeding. Anxiety about pacifiers for infants breastfeeding focuses on "nipple confusion" This is that the pacifiers and supplemental bottles do not facilitate effective breast absorption and can contribute to an incorrect latch. The pacifier has become a cultural base in many parts of the world and their use seems to correlate with a low rate of death syndrome [12].

A pacifier is an object designed for use by children aged two to five years of age. It works on replacing nipple breast mother. Although the alternative is convenient and effective for thumb sucking children, its use is highly questionable. To the development of medicine and technology,

damage was discovered related to its use and was associated with poor dental development. Moreover, the use of any industrial raw materials may cause harm to the child's health during the growth process [13].

It has been suggested that children in Chilean Patagonia use milk bottles and pacifiers far beyond the recommendations of health workers. Of fundamental importance is to answer the question, what kind of nutrition, breast or bottle, is better for oral cavity architecture and the effect of early speech acquisition. The development of oral car structures is reflected in the development of cranial facial and dental. To determine the potential risk factors for speech disorders in children, a better understanding of the link between nutrition in early life and absorption behavior and the development of subsequent speech is needed [14].

Doctors often asked for guidance on the use of children, especially with regard to benefits and risks, and when the child was appropriate. Benefits of using a pacifier include analgesic effects, shorter hospital stays for preterm infants, and reducing the risk of sudden infant death syndrome. The recommended pacifiers for pain relief in neonates and infants who undergo invasive procedures, in emergency department (e.g. Heel sticks, venous puncture, and vaccinations). Possible complications of using a pacifier, especially with long-term use, include a negative effect on breastfeeding, bad teeth, and otitis media [15].

Significance of the study:

Pacifiers may result in breastfeeding difficulties, dental problems, increased risk of middle ear infections, speech problems, swallowing difficulties, dependency, and negative social impacts. Babies who take a pacifier tend to wean earlier than those who do not.

The aim of the study:

To identify factors associated with the use of pacifiers in children.

2. METHODS

Design: A descriptive community based design was used for this study

Setting: The study was conducted in Emtidad Nasir primary health care center - Khartoum.

Subjects: The target population of this study consisted of 52 mothers of children who coming for vaccination during the study period.

Type of Sample: A purposive sample

Inclusion Criteria:

Mothers willing to participate

Healthy child

A tool for the study: The data for this study were collected using the following tool:

Structured Interviewing Questionnaire:

consists of four parts:-

Part-1: Socio-demographic designed questionnaire was used to collect the demographic data related to mothers and their children in the study; which included the following characteristics: mothers' age, mothers' educational level, child age, child's gender.

Part-2: Structured designed questionnaire was used to collect the child factors of using a pacifier consists of 9 multiple choice questions; each question has 2 choices (yes or no) only one is correct.

Part-3: Structured designed questionnaire was used to collect the mothers factors related to giving their children a pacifier consists of 10 multiple choice questions; each question has 2 choices (yes, no) only one is correct.

Part-4: Structured designed questionnaire was used to collect frequency of pacifier use consists of 10 options.

Validity of the tools:

The tools were tested for their content by three experts in the field of Pediatric Nursing and community health nursing to ascertain relevance and completeness.

Reliability of the tools:

Reliability was applied by the researcher for testing the internal consistency of the tool by administration of the tool in the same subjects before collecting the data to actually assess the clarity and simplicity of the questions. Reliability was estimated among 15 participants. The correlation coefficient was 0.83 which indicates that the questionnaire is reliable to detect the objectives of the study.

Procedure of data collection:

Agreement was obtained from the director of the primary health care center, and then approval for carrying out the study was obtained after explaining the aim of the study. Mothers were approached individually to explain the purpose and the nature of the study. Tools of the study were developed and implemented by the researcher using the interview questionnaire sheet to assess mothers and child factors related to using of a pacifier. The questionnaire was distributed to the mothers and the researcher was present during data collection for any help and guidance . Each interview was implemented on an individual basis and lasted for about 20-30 minute for each tool according to the mother's attention and willing to cooperate or talk with the researcher.

Duration of study: Data were collected throughout a period of the 3-months between June & August 2017.

Ethical consideration:

A verbal consent was taken from mothers to participate in the study after explanation of the purpose of the study. Informing study subjects' that the confidentiality and privacy of any obtained information will be ensured. Respecting the right of the study sample to be withdrawn from the study at any time.

Statistical analysis:

Data were collected by questionnaire from the mothers by a researcher. Mothers and child factors relating to use of pacifier

were calculated. Manual coding was done to check any error in coding. The manual coding and tables were developed before entering the data. Double entry of data from researcher was done to prevent potential data entry error. The data were checked and cleaned by performing preliminary frequency distribution to enhance accuracy and reliability. The data collected were tabulated & analyzed by SPSS (statistical package for the social science software) statistical package version 20 on IBM compatible computer. P-value of 0.05 was used to determine significance regarding:

- P-value > 0.05 to be statistically insignificant .
- P-value ≤ 0.05 to be statistically significant, and P-value ≤ 0.001 to be highly statistically significant.

3. RESULTS

Table (1): Characters of the mother and child age in studied group

Items	Study group (No = 52)		Mean	SD
	NO	%		
Mother age: < 20 20 – 30 >30	31	59.6	1.62	.820
	10	19.2		
	11	21.2		
Child age: < 6 months > 6 months	42	80.8	1.19	.398
	10	19.2		

Table (1): represents the characters of the mother and child age . It showed that; more than half of the mother aged less than 20 years old (59.6%). The majority of child age is less than 6 months 42 (80.8 %).

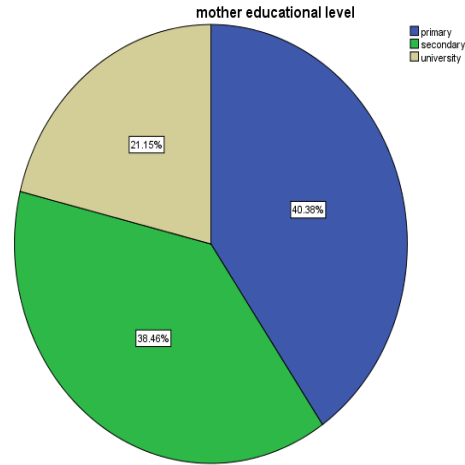


Figure (1) Categories the mother educational level (n=52)

Figure (1): Illustrates the mother educational level. It was demonstrated that the majority were in primary school, followed by secondary school , and finally university level .

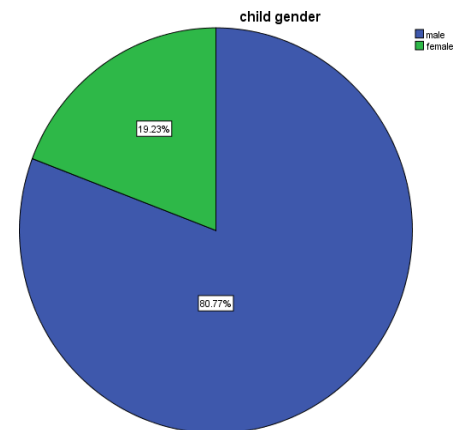


Figure (2) Categories the child gender (n=52)

Figure (2): showed the child gender. It was demonstrated that the majority of gender were male (80.77%).

Table 2: Factors related to the child using a pacifier in the study group.

Statement	Yes No (%)	No No (%)	Mean ± SD
The child first born	31 (59.6)	21 (40.4)	1.40±0.495
Child breast fed infant	20 (38.5)	32 (61.5)	1.62±0.491
Child end of pacifier	11 (21.2)	41 (78.8)	1.79±0.412
Child decreased weight	34 (65.4)	18 (34.6)	1.35±0.480
Child breastfed in the first hour after birth	22(42.3)	30(57.7)	1.48±0.499
Total factors related to the child mean score and SD regarding child using a pacifier			7.64±2.377

Table (2): illustrates factors related to the child use the pacifier. It was found that, mean of total score was 7.64±2.377.

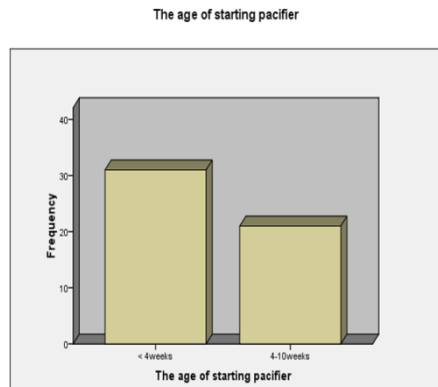


Figure (3) Categories the age of a child starting a pacifier (n=52)

Figure (3): Illustrates the child factor related to age of a child starting a pacifier. It was demonstrated that more than half of the children had started using of pacifier before 4 weeks age.

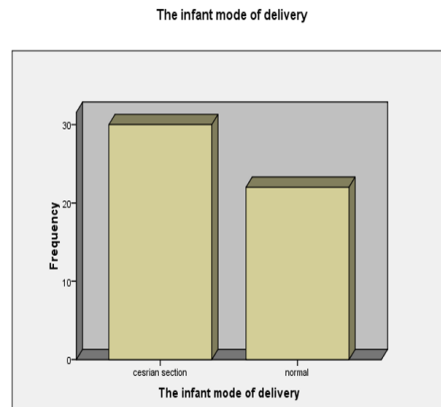


Figure (4) Categories the infant mode of delivery (n=52)

Figure (4): Demonstrates the child factor related to infant mode of delivery, more than half of the study group were delivered by cesarean section mode.

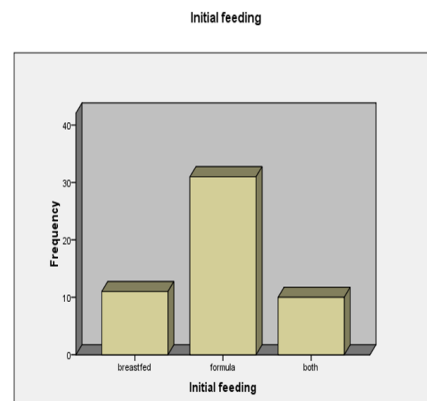


Figure (5) Categories the infant, initial feeding (n=52)

Figure (5): presents the child factors related to infant, initial feeding, the majority starting feeding with formula.

Table 3: Factors related to the mother in the study group.

Statement	Yes No (%)	No No (%)	Mean ± SD
Mother primigravida	31(59.6)	21(40.4)	1.40±0.495
Using of pacifiers is correlated with cultural issues	41(78.8)	11(21.2)	1.21±0.412
Did you have uncertainty about your ability to breastfeed and difficulty in breastfeeding?	42(80.8)	10(19.2)	1.19±0.398
Mother nervousness and impatience	31(59.6)	21(40.4)	1.40±0.495
The pacifier is convenient for the mother	45(86.5)	7(13.5)	1.13±0.345
Did you use a pacifier to stop crying of a baby?	45(86.5)	7(13.5)	1.13±0.345
Do you believe that pacifier uses, impacts speech production?	8(15.4)	44(84.6)	1.85±0.364
Give your child's pacifier because you are not healthy	7(13.5)	45(86.5)	1.87±0.715
Total factors related to the mothers mean score and SD regarding child using a pacifier			11.18±3.569

Table (3): illustrates factors related to the mother of child use the pacifier. It was found that, mean of total score was 11.

18±3.569.

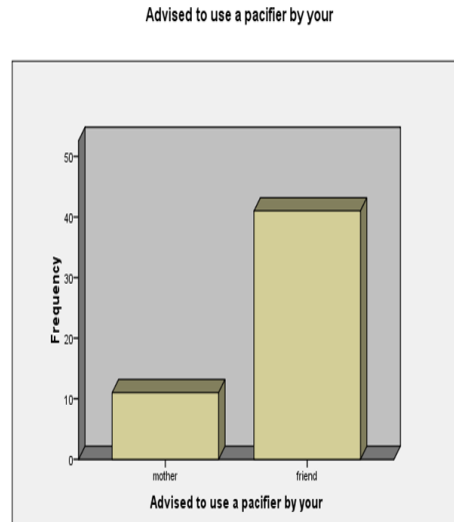


Figure (6) Categories the mother's whom advise her to use a pacifier for their children (n=52)

Figure (6): illustrate the mother whom advised her to give her child a pacifier, the majority advised by their friends.

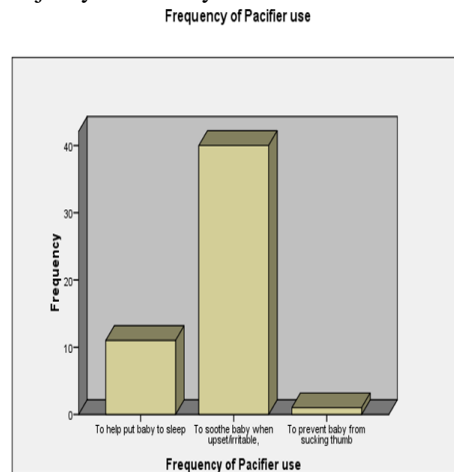


Figure (7) Categories the frequency for use a pacifier for their children (n=52)

Figure (7): showed the frequency for use a pacifier for their children, the majority of mothers gives their children a pacifier to soothe baby when upset or irritable.

Table 4: Relationship between child using a pacifier and other child characteristic.

Statement	A child using a pacifier	
	Pearson Correlation	Sig.
Is child is first born	-.434*	.001
Did your child breast fed infant?	-.920**	.000
The age of starting pacifier	-.022-	.876
Is your child end of Pacifier, age discontinue use?	-.613**	.000
Did your child decreased weight	-.444**	.001
The infant mode of delivery	-.214-	.128
Is infant breastfed in the first hour after birth	.214	.128
Initial feeding	.595**	.000

Table 4:Represents relationship among child using a pacifier and other child factors. It was reported that; regarding a child is first born, breastfed infant, end of the pacifier, decrease in child weight, and initial feeding there was a statistical significant positive correlation. While in relation to the child age of starting pacifier, the infant mode of delivery, and if an infant breastfed in the first hour after birth there was no a statistically significant.

Table 5: Relationship between child using a pacifier and mothers characteristic

Statement	A child using a pacifier	
	Pearson Correlation	Sig.
Is mother primigravida?	-.352*	.011
Mother working outside or housewife?	.031	.825
Is using of pacifiers is correlated with cultural issues	-.080-	.573
Did you have uncertainty about your ability to breastfeed and difficulty in breastfeeding?	.363**	.008
Mother nervousness and impatience	-.022-	.876
The pacifier is convenient for the mother	.187	.185
Did you use a pacifier to stop crying of a baby?	-.169-	.232
Do you believe that pacifier uses, impacts speech production?	.310*	.025
Advised to use a pacifier by whom?	.377**	.006
Did you give your child's pacifier because you are not healthy?	.050	.724
Frequency of pacifier use	.138	.328

Table 5:Represents relationship among child using a pacifier and mothers factors. It was reported that; if the mother is primigravida, mother uncertainty about ability to breastfeed and difficulty with breastfeeding, the mother believes that pacifier uses impact speech production,

and advised to use a pacifier by whom, there was a statistical significant positive correlation. While in relation mother working outside or housewife, is using of pacifiers is correlated with cultural issues, mother nervousness and impatience, the pacifier is convenient for the mother, mother uses a pacifier to stop crying of a baby, the mother gives child's pacifier because she is not healthy, and frequency of pacifier use there was no a statistically significant.

4. DISCUSSION

Non-nutritive sucking is a natural reflex for a fetus and newborn, usually manifested by sucking the hands and fingers. The pacifier also referred to as a -dummyl has been used as a method for fulfilling this innate desire. So assess the factors that contribute to using of pacifier by mothers for their children very important to prevent the most common complication such as a negative effect on breastfeeding, dental malocclusion, and otitis media [14].

The current study documented that, the children using a pacifier age less than 6 months were higher than others, and children gender male was higher than female. Most mothers, age less than 20 years old, these results supported by **Gabriela dos Santos Buccini et al. (2014)** [6]. They observed a predominance of children aged under six months and of the male gender. **Clarita Barbosa (2009)** [14] also observed that the majority were boys, and one quarter of mothers were younger than 20 years, and approximately half of the mothers had a high school education. In our study fewer of mothers completed higher education or university level, these results disagree with **Elaine Cristina (2017)** [10] who mentioned that the majority of the cases, complete high school or higher education. All these studies presented that the majority were male, this may be due to the male sex is anxious less patience than female. The

majority of mothers age is less than 20 years old, this due to their age is younger and having uncertainty regarding how to breastfeed her child. The majority of child age is less than 6 months, to help the child to be calm, and the majority of mothers having higher education this also may be due their working outside the home. This similarity and differences also may be due to the differences in setting, and study design.

The present study reported that, approximately one quarter of the children were breastfed within the first hour after birth. More than half of children uses of pacifier, these results supported by **Gabriela dos Santos Buccini et al. (2014)** [6]. They mentioned that two quarters of the children were breastfed within the first hour after birth. And few of them exclusively used pacifiers. These differences may be due to hospital policies and regulation, our study is descriptive, done in Sudan developing countries, while Gabriela study is cross sectional and done in Brazil is a middle income country. The factors related to the child use the pacifier. In the current study the majority of children starting using of a pacifier before 4 weeks child age this result supported by **Chelsea E Mauch et al, (2012)** [1] mentioned that pacifiers given to infants before four weeks and used most days.

The available study approved that, the majority of mothers working outside the home, and infant mode of delivery is cesarean section. More than of the mothers were primigravida, these results disagree by **Gabriela dos Santos Buccini et al. (2014)** [6]. Whom mentioned that the majority of mothers did not work outside the home, half of the deliveries were cesarean. Half of the mothers were primiparous, also more than half of mothers were primipara mentioned by **Elaine Cristina (2017)** [10]. The majority of mothers give their child a pacifier to

soothe baby when upset or irritable, and the majority advised by their friends, while **Chelsea E Mauch et al, (2012)** ^[1] mentioned that quarter of mothers were advised to use a pacifier by their mother/mother-in-law with a further 22.7% being advised by a midwife.

In the current study, the majority of mothers give their children a pacifier to soothe baby when upset or irritable, this result supported by **Chelsea E Mauch et al, (2012)** ^[1] mentioned that the majority of mothers used a pacifier in order to soothe their infant (78.3%), to help put them to sleep (57.4%) and to keep them comforted and quiet (40.4%).

5. CONCLUSION

The current study concludes that the children using a pacifier were significantly correlated with child if he/she is first born, breastfed infant, the child doesn't end the use of the pacifier, decrease in child weight, the initial fee is formula feeding, mothers primigravida, mothers uncertainty about her ability to breastfeed and difficult in breast feeding, mother did not know the effect of using a pacifier on her children, and friends advised her to give her child a pacifier.

6. RECOMMENDATION

The current study recommended that the conduction of health education programs for mother in all health care facilities about benefit and risk regarding using a pacifier for their children is very important.

7. ACKNOWLEDGMENT

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REFERENCES

1. Chelsea E Mauch, Jane A Scott, Anthea M Magarey and Lynne A Daniels. (2012). Predictors of and reasons for pacifier use in first-time mothers: an observational study. *BMC Pediatrics*. 12:7.
2. Ran D. Goldman. (2013). Pacifier use in the first month of life. *Child Health Update. Canadian Family Physician*. Vol 59.
3. Paul Walsh, Teri Vieth, Carolina Rodriguez, Nicole Lona, Rogelio Molina, Emmet Habebo, Enrique Calder, Cynthia Garcia and Gregory Veazey. (2014) . Using a pacifier to decrease sudden infant death syndrome: an emergency department educational intervention. *PeerJ* 2:e309; DOI 10.7717/peerj.309.
4. Welma Lubbe and Wilma ten Ham-Baloyi. (2017). When is the use of pacifiers justifiable in the baby-friendly hospital initiative context? A clinician's guide. Lubbe and ten Ham-Baloyi *BMC Pregnancy and Childbirth*. 17:130.
5. Brandi L. Joyner, Rosalind P. Oden, and Rachel Y. Moon. (2017). Reasons for Pacifier Use and Non-Use in African-Americans: Does Knowledge of Reduced SIDS Risk Change Parents' Minds?. *J Immigr Minor Health*. 18(2): 402–410.
6. Gabriela dos Santos Buccini, Maria Helena D'Aquino Benício, and Sonia Isoyama Venancio. (2014). Determinants of using a pacifier and bottle feeding. *Rev Saúde Pública*. 48(4):571-582.
7. Viviane V. Degan & Regina M. Puppim-Rontani. (2004). Prevalence of Pacifier-sucking Habits and Successful Methods to Eliminate Them—A Preliminary Study. *Journal of Dentistry for Children*-71:2.
8. Theresa R. Shubert, Swetha Sitaram, and Sudarshan R. Jadcherla. (2017). Effects of Pacifier and Taste on Swallowing, Esophageal Motility, Transit and Respiratory Rhythm in Human Neonates. *Neurogastroenterol Motil*. 28(4): 532–542.
9. Kelsey Elizabeth Wendt. (2014). Parent Perceptions of the

-
- Relationship Between Pacifier Use, Thumb Sucking and Speech Production. University of Arkansas, Fayetteville ScholarWorks@UARK. Rehabilitation, Human Resources and Communication Disorders. <http://scholarworks.uark.edu/rhrcuht/31>.
10. Elâine Cristina Vargas Dadalto, Edinete Maria Rosa. (2017). knowledge about the benefits of breastfeeding and disadvantages of the pacifier related to the mother's practice with preterm infants. *Rev Paul Pediatr.* 35(4):399-406.
 11. Paulo nelson-filho, Márcia Costa louvain, Soraia macari, dutold, Raquel Assed, Bezerra da silva, Alexandra Mussolino de queiroz, Patrícia gaton-hernández, Léa Assed Bezerra da SILVA. (2015). Microbial contamination and disinfection methods of pacifier. *J Appl Oral Sci.* 23(5) 523-8.
 12. Laura Wellington. (2012). Should breastfeeding babies be given pacifiers?. PURLs®. *The Journal of Family Practice.* Vol 61, No 5.
 13. Aliprandini P, Ferreira FB, Bertol LS, Kindlein Júnior W. Comparison of design, materials selection and characterization of pacifiers produced in Brazil. *Australasian Medical Journal AMJ,* 4, 2, 76-80.
 14. Clarita Barbosa, Sandra Vasquez, Mary A Parada, Juan Carlos Velez Gonzalez, Chanaye Jackson, N David Yanez, Bizu Gelaye and Annette L Fitzpatrick. (2009). The relationship of bottle feeding and other sucking behaviors with speech disorder in Patagonian preschoolers. *BMC Pediatrics,* 9:66 doi:10.1186/1471-2431-9-66.
 15. Sumi sexton & Ruby natale. (2009). Risks and Benefits of Pacifiers. <http://aafp.org/afp/.0415/681-s1.html>.
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