ANALYSIS OF THE RELATION OF INTRAUTERINE DIGITAL SUCKING WITH THE PERMANENCE OF THE HABIT IN THE POST BIRTH CHILD

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ABSTRACT

AIM: This research aims to investigate the development of this habit's appearance, which may be observed even at the intrauterine stage and which also persists for a long time. **MATERIAL AND METHODS:** 25 gestations that presented children practicing intrauterine digital sucking habits were followed-up. The initial analysis was accomplished through routine ultrasound examination, using pregnant women between the 4th and 8th gestation months who visited João de Barros Barreto University Hospital. Detecting this habit, every quarter an afterbirth accessory was carried out,over a 1 year period, in order to observe the habit's persistence. This phase was developed in the Dental Office of the Brasil Sorridente Program. Statistical analysis were carried out regarding the obtained outcomes using the described statistics and inferential methods, and the Chi-square test with 5% significance level was applied. **RESULTS:** This research observed that 72% of babies were male gender and 28% female gender, 68% of babies persisted with the digital sucking habit 1 month afterbirth, 72% until the second month, 56% until the fifth month and 48% until one year old. Assessing the habit's post natal persistence according to gender, the binominal test was applied which was significant (p=0.0186). It was concluded that the number of male babies with digital sucking habit was above the female gender (p=0.0455), the habit's persistence was reduced by 50% when compared with the first month, however, the p=0.2474 indicates that the reduction was not significant. **CONCLUSION:** Our outcomes cannot be generalized; however they can be used as a base for future research in this area.

KEYWORDS

Digital sucking. Digital habit. Primary dentition. Ethiological malocclusion factors.

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INTRODUCTION

Digital sucking is the initial form of body manipulation, which may be observed in an early stage through routine ultrasounds in intrauterine babies. The choice of the fingers to be sucked occurs in the course of random moves of the child, and represents an act of complex coordination through which they take control of their environment. However, such habit may become harmful, leading to the child developing dental misalignments, malocclusions, facial asymmetries, lip deformities, tongue misplacement, interference with speech and deglutition[1].

Seen as a conduct disorder, digital sucking may last for years in a child, yet it may start at a very early stage. However, effectively, when would this practice of harmful consequences to a child's occlusion begin? With the encouragement of prenatal consultation and ultrasounds, we have frequently discovered intrauterine children practicing digital sucking, especially of the thumb, which lead us to think of adverse situations which cause them to adopt such practice, all or almost all, mainly focusing on the emotional and psychological aspect of the child as the main cause[2].

Considering the high prevalence of digital sucking habit in children, it becomes very important in odontological practice to seek and understand a relationship between the sucking practiced in intrauterine life and the continuation of such practice, as well as determining whether potential disorders which occurred with the mother, during pregnancy, may have affected them psychologically and then be related to the appearance of the habit in the child, seeing that currently waiting to treat harmful effects already installed no longer makes sense, because in addition to being more difficult and complicated, it becomes more costly[3].

With data obtained from the study of digital sucking habits, we hope to contribute to the process of prevention of various problems which may appear and alter the correct occlusional development in the child.

The initial psychological development phase which occurs in humans is called the oral phase, where the satisfaction of pleasures and self subsistence are related to the perfect functioning of the stomatognathic system, being the buccal cavity responsible for eating functions and acknowledgement of the environment itself.

Moyers (1991) addresses various theories which seek to explain digital sucking. He highlights that various forms of understanding of the subject are not fully incompatible with each other. He specifically suggests that the digital sucking habit should be seen as a behavioural standard of multivariate nature. It's possible that digital sucking begins for a reason and is then

maintained in subsequent ages due to other factors[4].

Digital sucking comprises a progressive conduct disorder, which may begin very early and acquire characteristics typical of the development moment. It's intimately related to emotional satisfaction, and may be associated to a lack of affection or even feeding at the beginning of life[5]. Digital sucking has, mainly, the function of protecting the individual from stress, which may be a way of releasing anxiety[6].

The moment of appearance of the habit has meaning. Those that appear during the first weeks of life are related to feeding problems. Many children, however, later, find in digital sucking the release of emotional stresses which they are not able to overcome, finding comfort in regressing to infantile behavioural standards[7].

Habits of non nutritive sucking, such as digital sucking, when prolonged over four years of age, are considered deleterious and liable to intervention, due to the possibility of causing damage to occlusion and facial growth of children, in addition to the associated psychological aspects[8,9, 10, 11].

Digital sucking is a physiological and necessary act, and as such, needs to be respected. It's so inherent to the foetus that, even fed through the placenta, they instinctively and energetically suck their tongue, lips and fingers in a way which, when born, this function is fully developed[12].

The etiology of non nutritive sucking habits has been widely researched. In medical and odontological literature there are divergent explanations for this complex problem[13]. Three theories attempt to explain the prolongation of such a habit in children: (1) insufficient satisfaction of sucking needs during childhood[2, 13, 14], (2) emotional disorders[15, 16], (3) learned habit[17, 18].

Contrary to the majority of studies referred to, Brazelton (1990) observed that breastfed babies sucked their fingers more than bottle fed babies. He discovered that the act of sucking the finger began immediately after birth and was used during the following periods: at bed time, upon waking, when resting, during or after playing and when stopping breastfeeding. Then, when they begin to walk, the baby would suck their fingers when becoming over excited and when needing to relax. At 7 months, the frequency and duration of sucking the fingers would increase for up to a period of four hours per day. After this phase, it would decrease. Whenever babies learned a new motor ability, such as sitting or crawling, dependence during the learning period would increase. However, finally, when the new stage was achieved, the habit would decrease[19].

The sucking habit contributes as an etiological factor in the deterioration of

occlusion and alteration of the normal standard of facial growth, which may become a harmful habit, according to frequency, intensity, duration, individual predisposition, age and nutritional conditions; consequently, of an individual's health[4, 18,20].

Current psychiatry attempts to analyse the most logical etiological factors associated with the habit, as being of a hereditary predisposition, home environment, a cause of stress which introduces escapism[21].

A recent study analysed the presence of digital and hand sucking in the foetus in intrauterine life, with important factors related to pregnancy for its manifestation. Two ultrasound exams were carried out in 55 pregnant women, between the periods of 20-24 and 25-30 weeks, so that approaches were performed using a questionnaire, with the purpose of evaluating the level of satisfaction of the woman's pregnancy.

Pregnant women with systemic problems also participated in the sample, seeing that the authors of the research wanted to verify whether there was any correlation between the presence of the digital sucking habit and problems during pregnancy.

Statistically there were no significant differences between the pregnant woman's health condition and the level of pregnancy acceptance with the manifestation of digital sucking in the foetus. Cochran's Q test did not evidence any significant differences between the signs of digital sucking in foetuses and the installation of the habit in newborn babies[22].

MATERIAL AND METHODS

Initially, the project referent to this research was submitted for evaluation by the human research ethics committee of the Federal University of Pará (UFPA), which obtained a favourable report, under protocol number 005/2005.

This work, due to being a longitudinal study, was performed in two phases. The first, that observed pregnant women who presented the foetus practicing the digital sucking movement, identified through routine ultrasound. When the foetus was identified practicing digital sucking, the mothers were asked about any emotional stress condition present at the time or near it. And in the second phase, follow-up of these children for investigation of the persistence or not of the habit, during their first year of life, through clinical tests.

All pregnant women were informed regarding the research in which they would be participating and, after reading the term of informed consent, they signed it.

To comprise the sample, 288 pregnant women who attend the Ultrasound Service of the University Hospital João de Barros Barreto were examined. Of them, only 35 were suitable in the inclusion criterion and were able to participate in the research.

As an inclusion criterion, pregnant women with gestational ages ranging between 16 to 32 weeks, clinically healthy were considered. These gestational ages were chosen due to being periods in which the foetus is found totally formed. In this phase, the amount of amniotic fluid is sufficient to allow greater foetal movement[41]. In the eighth and ninth months, visualisation becomes more difficult, because there is less space and fluid for foetal movement. For the children, the inclusion criterion was: foetus with no dysplasia; practicing digital sucking movements, in at least one (1) routine ultrasound exam.

The first data collection was performed in the ultrasound exam room of the University Hospital João de Barros Barreto; at this moment only the presence of the foetus sucking the thumb was verified during the routine ultrasound exam and following the pregnant women were registered in an Excel spreadsheet for further follow-up.

The second part of data collection was carried out after the baby's birth. The registered mothers were contacted for a new assessment consultation with the researcher, a month after the birth of their babies, in the Brasil Sorridente Program at the Odontology School of the UFPA for verification of the persistence of the baby's digital sucking habit. This exam was repeated in the 2nd, 5th, 7th, 9th and 12th months to allow better control regarding the persistence of digital sucking habit.

Descriptive and inferential statistical methods were applied in order to analyse the results. In the interferential treatment the statistical Chi-square test was applied (for a sample). The significance level of 5% was established as a decisional standard for rejection of nullity hypothesis.

RESULTS

288 pregnant women were examined; of these, 12% (35 pregnant women) presented foetus practicing digital sucking at the time of the routine ultrasound, however, only 25 babies remained until the end of such research, since that throughout the research there were pregnant women who lost their foetus, some didn't return to their visits during the pre-established periods, some returned to their hometown not being able to return and some gave their children up for adoption.

When assessing the foetus' sexes, it was observed that 72% were male and 28% female. Applying the inferential analysis, results have shown that the number of males with digital sucking habit was much higher in relation to females, p=0.0455.

DISCUSSION

Most studies regarding buccal habits[23,21,24,17], mainly digital sucking, present

the etiology and treatment from newborns, with few studies regarding sucking activity beginning in intrauterine life, as well as the monitoring of this activity.

Of the 25 foetus' which presented the habit of intrauterine digital sucking, 68% (17 babies) persisted with digital sucking habit a month after birth. Up until the second month, 72% (18 babies) persisted with the habit. Up until the fifth month, 56% (14 babies) persisted with the habit and this number remained until the seventh month. When completing the ninth month the number decreased to 48% (12 babies) and the previous number remained until the 12th month (Table 1).

Table 1. Digital sucking habits according to month, n=25.

Up until when digital sucking was used	Number of babies	Percentage
Month 0	25	100.0
Month 1	17	68.0
Month 2	18	72.0
Month 5	14	56.0
Month 7	14	56.0
Month 9	12	48.0
Month 12	12	48.0

Generally, it was observed that the persistence of digital sucking habit reduced by half in relation to the initial month. However, the result of the p=0.2474 indicates that the reduction was not significant.

In specialised literature we find that in intrauterine life, instinctively, the foetus sucks the lips, tongue and fingers, in a way which these functions are found fully developed when they are born[5]. In this work the act of taking the fingers or hand into the mouth were considered signs of sucking and leaning towards initiation of postnatal digital sucking.

According to the results, 68% of the foetuses continued with the sucking habit after one month of life; of these 48% continued up until one year of life.

This reduction was not significant since many of the babies probably suck their thumb in order to release emotional tension which they are not able to overcome, in other words, in a way which enables babies to discharge their anxiety. For Moyers (1991)[4] it is likely that finger sucking has begun for a reason and is sustained in the subsequent ages by other factors.

It was observed that in the second month there was an increase in the percentage of infants with thumb sucking habit, which went from 68% to 72%. This increase is due to the fact that babies, who had abandoned the habit, had then resumed it.

Of the 68% of babies who had had the habit in the first months of life, only 48% of

them continued the habit. The child, who sucked their thumb after the first year of life, tends to suck it for longer periods of time. This act gradually reduces, disappearing between two to five years old, approximately. Corroborating our research, another study noted that from birth to 2 years the habit occurs in 50% to 67% of children. From 2 to 5 years of age this number drops from 24% to 43%. From 6 to 10 years of age the prevalence is around 17%, while in children over 10 years of age the habit exists in 10% of children[25].

The physiological need of suction ceases between nine and twelve months of age whereas the psychological need to persist exists for a longer time, for example, during times when the child is unhappy, tired, worried, anxious or nearly sleeping[8]. Corroborating this idea, the habit of finger sucking in 19 children is observed in other reserach[24]. The initiation of this habit occurred in 38.9% of cases soon after birth, between 1 and 4 months 44.4% and 16.7% began the habit after 6 months of age. The average time to abandon the habit of sucking finger(s) was approximately 9.4 months, however only 13 children abandoned the habit[24].

The continued digital sucking habit is the result of a change in behaviour reflecting poor oral development, becoming compensatory during periods of stress[23].

Assessing the presence or not of the habit of digital sucking in accordance with gender, it was observed that seven babies were female, six (86%) persisted with the habit of digital sucking at one month old. In the second month, the number of babies returned to 7. Upon completing the fifth month, six infants (86%) persisted with digital sucking and maintained the same amount as in the previous 12 months. Of the 18 male babies, 11 (61%) of infants were observed persisting with the habit in the first and second month. In the fifth and seventh months, the persistence of digital sucking was 8 (44%). In the 9th month it decreased to 6 (33%) babies and remained the same amount as the previous 12 months (Table 2).

For the inferential analysis the binomial test, which used only events from the 12th month, was applied. Therefore the result was significant (p=0.0186) indicating that the digital sucking habit persisted among girls, while boys tended to abandon the habit in the last analyzed month.

Chacon (1997)[26] compares the child's digit with a compass , stating that both the baby and the needle feel safe with the instrument. Sucking their finger(s), the baby brings all the pleasures and sensations of the world into their mouth, since this is the main perception organ at birth.

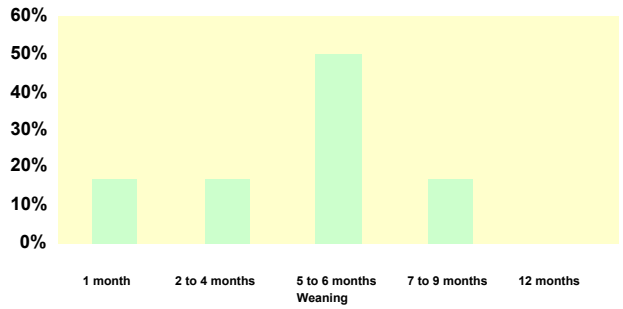
Of the 12 babies who persisted with the digital sucking habit until the first year of life, 100% were breastfed. Of these babies, 16.67% were weaned when they were a month old,

16.67% were weaned between 2 and 4 months, 50.0% were weaned between 5 and 6 months, 16.66% were weaned between 7 and 9 months and no occurrence was observed when they were 12 months old (Figure 1).

Table 2. Digital sucking habits according to gender, n=25.

Until when digital sucking was used	Female		Male	
	(n=7)	Percentage	(n=18)	Percentage
Month 0	7	100.0	18	100.0
Month 1	6	86.0	11	61.0
Month 2	7	100.0	11	61.0
Month 5	6	86.0	8	44.0
Month 7	6	86.0	8	44.0
Month 9	6	86.0	6	33.0
Month 12	6	86.0	6	33.0

Figure 1. Percentage of children according to the weaning period and that persisted with the habit up until 12 months of age, n=12.



Although most authors[23,10,14,27,20] assert that exclusive breastfeeding does not lead to the development of the deleterious habit of digital sucking, it was observed in this study that all 12 children (48%), who persisted in the habit for 12 months, were breastfed. The weaning period ranged from 1 month to 9 months, however 50% of babies were weaned between 5-6 months. The justification for this percentage of children who developed the habit of non-nutritive sucking, even having been breastfed, may find subsidies in fact the child operated automatic suction in order to obtain pleasure or emotional fulfilment through the thumb.

Shoaf (1979)[13] in his research, found results similar to those revealed, so that children who were breast-fed have twice the prevalence of sucking habits than those who were bottle fed, although the duration of the habit is two and a half times lower when compared with children who are bottle fed, eliminating the habit within two years duration. Farsi (1996) also notes a lack of correlation between breastfeeding and acquiring the habit of digital sucking.

Brazelton (1990)[19] also observes in his studies that breast-fed babies sucked their finger/(s) more than bottle-fed ones. The act of thumb sucking was found to be initiated immediately after birth and was used during periods such as: bedtime, upon awakening, resting during or after play, and leaving the mother's breast.

In order to seek correlations between the presence of intrauterine digital sucking and

the emotional state of pregnant women, it was observed that 23 women (92.0%) presented with problems that suggested stressed conditions, and only two women (8%) reported no cases of emotional disorders (Table 3). Applying the statistical test showed that the number of mothers with problems suggests a condition of emotional stress was indeed significant, since the p<0.0001.

It is the general consensus in literature that distress and emotional trauma suffered by pregnant women cause problems for the normal development of the foetus[22]. However, there is no scientific evidence that emotional states influence the behaviour of the mother and baby in organic structures, except in the case of glandular alterations resulting from emotional stress, which generate excessive motor activity of the foetus, persisting for the duration of stress[22].

Table 3. Occurrence of pregnant women with problems that suggested stressed conditions, during the intrauterine period, all babies with digital sucking habit.

Mother's emotional stress condition	**(n=25)**	**Percentage**
Yes	23	92.0
No	2	8.0
p-value	< 0.0001*	

*Chi-Square test.

Regarding the effect of problems which suggest a condition of emotional stress from the onset of signs of sucking, this research showed that 92% of women had an emotional stress condition. These values are statistically significant (p <0.001). Corroborating this idea a study of newborn babies[23] showed that 65.8% of mothers who had their pregnancy without emotional and health problems, had fewer children without the habit of finger sucking.

Contradicting these ideas, research conducted with 42 pregnant women evaluated the degree of satisfaction of pregnancy, the presence of digital sucking and found that the state of satisfaction with pregnancy does not interfere with the foetuses examined who displayed digital sucking[22].

As for Toledo (1996)[28], the primary cause of non-nutritive sucking is related to the lack of maternal care during the postpartum period, causing the baby to relieve their corporal tensions and find alternative needs of stimulus. This framework is justified in the last decades due to a change in the habits and behaviour patterns of family life, where women have become more active in the socio-economic framework. This has consequently led to less contact time with their children, causing a behavioural change in them.

CONCLUSION

Through the results found in this research, we conclude that ultrasound is important, not least to inform pregnant women regarding the development and gender of their foetus', but also for the observation of foetal movement of the hands and fingers in relation to the mouth, because once detected, the ultrasonographist may inform the women, preventing a possible formation of deleterious buccal habit, considered by the orthodontists as the etiology of malocclusion of a more complicated correction.

If the digital sucking habit is detected early, there's an evaluation of the child's potential risk, therefore, we are able to use resources in order to reduce the problem. One of the alternatives would be trying to substitute the digit for a pacifier, because in the future it will be easier to treat the habit.

Early diagnosis and intervention facilitates acting promptly, avoiding the continuity of negative effects of the undesirable habits, when these are already installed.

We also conclude that: (1) the number of male babies with digital sucking habit was higher in relation to female babies; (2) the persistence of the habit reduced by half in relation to the initial month, however, the result of the p=0.2474 indicates that the reduction was not significant; (3) digital sucking habit persisted among girls, whilst boys tended to abandon the habit in the last analysed month.

Our results shouldn't be generalised, however, they serve as a support for more researches in this area.

REFERENCES

1. Black B, Kovesi E, Chusid IJ. Pernicious bucal habits. Ortodoncia 1990;23:40-4.

2. Coeli BM, Toledo OA. Hábitos bucais de sucção: aspectos relacionados com a etiologia e com o tratamento. Rev Odontopediatr 1994;3:43-51.

3. Coletti JM, Bartholomeu JAL. Hábitos nocivos de sucção de dedo e/ou chupeta: etiologia e remoção do hábito. J Bras Odontopediatr Odont Bebê 1998;1:57-73.

4. Colisti LJP, Cohen MM, Fales MH. Correlation between malocclusion oral habits and socieconomic level of preschool children. J Dent Res 1960;39:450-4.

5. Farsi NMA, Salama FS. Sucking habits in saudi children: prevalence, contributing factor on the primary dentition. Pediatr Dent 1996;19:28-33.

6. Fetcher BT. Etiology of fingersucking: review of literature. J Dent Child 1975;42:45-50.

7. Kharbanda OP, Sidhu SS, Shukla DK, Sundaram KR.. A study of the etiological factors associated with the development of malocclusion. J Clin Pediatr Dent 1994;18:9-98.

8. Klein E. The thumb-sucking habit: meaningful or empty? Am J Orthod 1951;59:283-9.

9. Larsson EF. The prevalence and the etiology of the initial dummy-and finger-sucking habit. Amer J Orthod 1985;87:432-35.

10. Lester M, Baer PN. The thumb, the pacifier, the erupting tooth and a beautiful smile. J Pedodont 1987;11:113-9.

11. Graber IM. Ortodoncia: teoria y practica. Nueva Editorial Interamericana; 1974.

12. Ogaard B. The effect of sucking habits, cohort, sex, intercanine arch widths and breast bottle feeding on posterior crossbite in norwegian and swedish 3 years-old children. Am J Orthod Dentofacial Orthop 1994;106:106-61.

13. Queluz PD, Aidar MJ. Chupeta: um hábito nocivo? JBP 1999;2:324-7.

14. Sweden F. The prevalence and etiology of prolonged dummy and finger-sucking habits. Eur J Orthod 1985;7:172-6.

15. Serra-negra JMC, Pordeus IA, Rocha JF. Estudo da associação entre o aleitamento, hábitos bucais e maloclusões. Rev Odont USP 1997;11:79-86.

16. Shoaf HK. Prevalence and duration of thumbsucking in breast-fed and bottle-fed children. J Dent Child 1979;46:34-7.

17. Tenório MDH, Rocha JES, Fraga AB, Tenório DMH, Pereira PS. Sucção digital: observação em ultra-sonografia e em recém-nascidos. Radiol Brás 2005;38:435-8.