

Prolonged pacifier usage in infancy does not cause eating behavior problem later

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SUMMARY : Kaymaz N, Yıldırım Ş, Cevizci S, Bulur N, Topaloğlu N, Binnetoğlu FK, Tekin M, Kılıç M, Özmert EN. Prolonged pacifier usage in infancy does not cause eating behavior problem later. Turk J Pediatr 2015; 57: 487-491.

The objective of this study conducted in children aged 3–7 years was to determine whether pacifier use during infancy is associated with eating problems in later periods. A total of 85 children (55.2 ±12.3 months) admitted to hospital with eating problems and with no organic pathology in scans, and 97 healthy children (52.24±10.97 months) without eating problems, were assigned to case and control groups, respectively. Eating problems were classified into five groups and investigated via a questionnaire. The presence of eating problems was analyzed for association with pacifier use. There was no significant difference between the two groups in terms of pacifier use (chi-square test: 0.141, p=0.707), and pacifier use is not related to a poor appetite in later periods. Pediatric healthcare providers and parents should be informed with regard to the subject.

Key words: eating problems, infant, pacifier usage, poor appetite.

Nutritional problems often develop between the ages of 18 months and 3 years.¹ According to their parents, approximately 25–35% of toddlers and preschoolers are poor or “picky” eaters.² Nutrition and eating problems often cause parent-child conflict and can be a serious concern for parents; however, in most cases, these children have an appetite that is normal for their age and rate of growth.³ Appetite can be affected by numerous environmental factors, which can be classified as belonging to the child, to the mother, or to the environment. Pacifiers have never previously been addressed in terms of being one such environmental factor. They are used to soothe infants, to reduce stress and pain during procedures, and to aid sleeping.⁴ Recent studies have shown an inverse relationship between the use of pacifiers and the risk of sudden infant death syndrome (SIDS), especially when use is during sleep. Encouraging the use of pacifiers is recommended to reduce the risk of SIDS.⁵ However, pacifiers may cause

dental malocclusion, recurrent otitis media, and gastroenteritis,⁶⁻⁸ and, particularly in the long-term, potential complications of pacifier use include a negative effect on breastfeeding; frequency of breastfeeding may be reduced as a result of using a pacifier to soothe an infant,⁹ since a child with a pacifier continually in its mouth may experience partial oral fulfillment. Thus, use of pacifiers may affect feeding. If the frequency of feeding in the early period of childhood is low, it may become a habit in subsequent periods, leading to poor appetite. The aim of the present study was to evaluate whether the use of pacifiers during infancy can lead to lack of appetite in later periods.

Material and Methods

A case-control study was conducted in 182 children (100 boys, 82 girls) aged 3–7 years who had been admitted to Mardin Women and Children’s Hospital, Mardin, Turkey. Children with the complaint of poor appetite and no

organic pathology were included in the poor appetite group, and healthy children with no eating problems and from the pediatric outpatient clinic of the same hospital were included in the control group. Poor appetite was defined as having at least one of the following eating problems: limited intake of nutrients, refusal to eat, preferring to drink rather than eat, picky eating, long duration of chewing, and lack of interest in meals. Exclusion criteria for both groups were as follows:

- Premature babies
- Children with abnormal oral skills and a habit of vomiting
- Chronic diseases (asthma, hypertension, inflammatory diseases, hyperthyroidism, etc.)
- Abnormal laboratory findings (previous records of complete blood count, erythrocyte sedimentation rate, C-reactive protein, serum electrolytes, venous blood gas, blood glucose, blood urea nitrogen, creatinine, serum protein and albumin, serum iron, total iron binding capacity, saturation, ferritin, calcium, phosphorus, alkaline phosphatase, liver enzymes, serum immunoglobulins, tissue transglutaminases, thyroid function tests, and urinalysis)
- Children of parents who practiced inappropriate feeding techniques (including threats, prodding, scolding, punishment, pleading, bribing, or coercing), which are considered to reduce, rather than increase, food intake
- Children going to a day-care center (n=3)

The study was carried out in the form of a questionnaire, which was completed during a face-to-face interview by parents of children who agreed to participate in the study. The

questionnaire was composed of two parts. In the first of these, the questions were designed to gather information regarding the children's demographics, including age, gender, gestational age, birth weight, and delivery mode. The second part consisted of questions relating to infant feeding habits, time of beginning complementary feeding, end of night-time feeding and non-nutritional habits, such as pacifier use and bottle use. Beginning and cessation times of pacifier use were enquired of, and pacifier use duration was calculated. To minimize the recall bias, children aged under 7 years were enrolled in the study. In total, 237 patients were surveyed, and 27 children (11 in the case group, 16 in the control group) were not included as their mothers chose not to participate. Incomplete answers to the survey led to the exclusion of nine children from the case group and 19 children from the control group. Socioeconomic status (SES) was defined as "good, moderate, or bad" according to the perception of the parents. The parents provided written informed consent for the participation of their children, and the necessary legal and university ethical committee approvals were obtained.

Body weight and height were measured by the same researcher (NB). Body mass index (BMI) was calculated using the formula weight (kg)/height² (m²), taking the standard reference height and weight percentiles for Turkish children, according to age and gender¹⁰, and BMI percentiles were based on the World Health Organization (WHO) Multicentre Growth Reference Study Group (2007). Patients under the 5th percentile were evaluated as underweight, those between the 5th and 85th percentile were classed as normal weight,

Table I. Demographic Characteristics of the Patients

	Poor-appetite group (n=85)	Control group (n=97)	
	Mean±SD	Mean±SD	P
Age (mo)	55.28±12.35	52.24±10.97	0.106*
Birth weight(g)	3096.47±618.98	3188.97±480.22	0.210*
BMI	14.96±1.45	16.31±1.38	0.001*
Gender	N (%)	N (%)	0.1**
Female	31 (36.5)	48 (49.5)	
Male	54 (63.5)	49 (50.5)	

*Mann-Whitney U test, SD: Standard deviation; ** Chi-square test

BMI: Body mass index value when admitted to study

those between the 85th and 95th percentile was categorized as overweight, and those above the 95th percentile were evaluated as obese.

Statistical analysis was carried out using a Statistical Package for the Social Sciences, version 19.0, software package. Pearson’s χ^2 test was used to compare categorical variables. Continuous variables were shown as mean±SD or median (min-max), where applicable. The mean differences between groups were compared using the Student’s t test, while the Mann Whitney U test was applied for comparisons of the median values. Categorical data were analyzed by Pearson’s Chi-square or Fisher’s exact test, where appropriate.

Results

A total of 182 children (100 boys and 82 girls) were enrolled in the study. The demographic characteristics of the participants are summarized in Table I.

In the case group, 31 children (36.5%) used a pacifier for a mean duration of 18.06±13.20 months (median: 12.00, min:2-max:54), and in the control group 38 children used a pacifier (39.2%) for a mean duration of 19.26±9.04 months (median:24, min:3-max:30). There was no significant difference between the two groups in terms of pacifier use (chi-square test: 0.141, p=0.707) and the duration of use (p=0.210).

Among the children that used a pacifier, 31 (44.9%) had a poor appetite, and 38 (55.1%) had a normal appetite. The appetite status in pacifier users and non-users is shown in Figure 1.

The mean BMI percentile values of participants who used pacifier (n=69) and those of non-users (n=113) were similar (15.87±1.58 vs. 15.56±1.54, respectively p=0.188).

Children identified by their parents as having an eating problem were significantly thinner than other children (Table I). The mean BMI percentile of the normal appetite group was significantly higher than that of the poor appetite group (16.31±1.38 vs. 14.96±1.45; Student’s t test: p<0.001).

Evaluating both groups together, 169 participants (92.86%) were breastfed. All (n=85) of the poor appetite group (100%) were breastfed, and this ratio was 86.6% (n=84) in control group.

Duration of breastfeeding was 16.15±8.50 (min:1-max:48) months in the poor appetite group, and 14.67±6.88 (min:3-max:30) months in the control group. There was no difference between the two groups in terms of duration of breastfeeding (Student’s t test: p=0.213).

The participants who used a pacifier were breastfed for an average of 11.78±8.67 (min:1-max:48) months, while non-users were breastfed for an average of 17.32±6.49 (min:1-max:36) months. The average duration

Table II. Feeding Characteristics of Pacifier Users and Non-Users During Infancy Period According to Case and Control Groups

	Poor-appetite group (n=85)		P*	Control group (n=97)		P*
	Used pacifier (n=31) Mean±SD	Not used pacifier (n=54) Mean±SD		Used pacifier (n=38) Mean±SD	Not used pacifier (n=59) Mean±SD	
Duration of breastfeeding (mo)	14.00±10.47	17.38±6.92	0.08	9.22±5.04	17.26±6.10	<0.001
Duration of formula (mo)	21.60±4.54	19.00±4.65	0.31	10.23±5.44	12.55±4.79	0.07
Duration of bottle usage (mo)	20.00±14.34	20.75±7.97	0.85	21.42±5.03	18.84±4.65	0.12
Beginning time of complementary feeding (mo)	5.94±1.61	5.65±1.28	0.37	6.55±1.11	6.44±1.09	0.62
Duration of night-time feeding (mo)	20.87±8.89	21.11±7.47	0.90	21.11±4.62	19.85±3.58	0.14

*Independent student T test, p values show comparison of pacifier using and not using groups in case and control groups.

of breastfeeding was significantly shorter in pacifier-users ($p=0.001$; Mann Whitney U test). The correlation between duration of breastfeeding and pacifier use is shown in Figure 2.

In the poor appetite group, duration of breastfeeding was similar between pacifier users and non-users, whereas in the control group, duration of breastfeeding was significantly longer for non-users ($p<0,001$). Other feeding characteristics are shown in Table II.

In the poor appetite group, 27.1% ($n=23$) of the children were formula-fed, while 49.5% ($n=48$) of the control group were formula-fed. The mean duration of formula feeding was 11.18 ± 5.21 (min:4-max:21) and 20.79 ± 4.69 (min:6-max:30) months in the two groups, respectively. A significantly higher percentage of the children who were formula-fed used pacifiers, in both the case (60.9%) and control (68.8%) groups ($p=0.004$ and $p<0.001$, respectively).

In terms of bottle usage, 40.0% of the

case group and 47.4% of the control group were bottle-fed ($p=0.314$). Pacifier use was significantly higher in bottle-fed children in both the case and control groups ($p=0.041$ and $p<0.001$, respectively).

In the poor appetite group, the mean time of beginning complementary feeding was 5.75 ± 1.40 (min:4-max:9) months, and was 6.48 ± 1.09 (min:4-max:9) months in the control group. The poor appetite group had begun complementary feeding significantly earlier than the control group ($p<0.001$).

There was no statistically significant difference between the groups in terms of self-reported SES ($p=0.122$).

Discussion

In the present study, no relationship was found between use of a pacifier in infancy and poor appetite in later periods. The rate of pacifier use was 37.8% in our study, and while no previous studies have examined pacifier use in Turkish children *per se*, it has been reported as 43.7% in one study.¹¹

Eating habits develop during infancy. Children will have individual appetite patterns, and numerous factors may affect a child's appetite status. Studies of failure to thrive have suggested that these children eat less than their peers, and their mothers define them as having a poor appetite.¹²⁻¹⁴ Similarly, there were more underweight children in the poor appetite group than in the control group in the present study, although no organic pathology was found. Therefore, the worries of mothers with regard to their children's appetite should not be ignored.

Early behavioral intervention can play an important role in normalizing feeding behaviors. Weaning a baby from frequent use of a pacifier may be difficult, particularly when there is compulsive use during the daytime.¹⁵ Such use should be discontinued by the age of 3 or 4 years, in order not to affect speech and dentition.¹⁶ In our study, the group maximum time for pacifier use was 54 months in all children. It is known that pacifier use can lead to poor breastfeeding, due to nipple confusion, and pacifier users have experienced more problems with insufficient milk supplies.¹⁷ In our study, the average duration of breastfeeding for

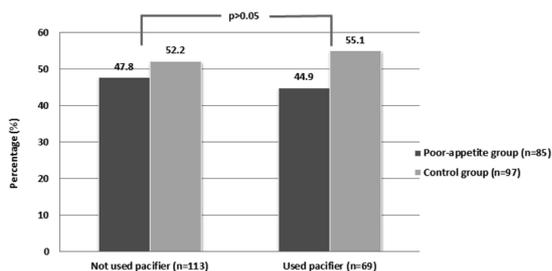


Fig. 1. Appetite status in pacifier users and non-users. The difference was not statistically significant.

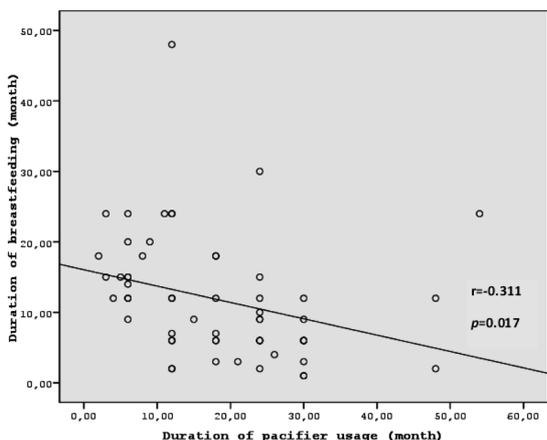


Fig. 2. Correlation between durations of breastfeeding and pacifier usage in our study group.

those using pacifiers was significantly shorter than those not using pacifiers, in accordance with the majority of the literature.¹⁸ One recent study highlighted a strong association between bottle-feeding and pacifier use. Most pacifier users discontinued the habit between 3 and 4 years of age and, in this subgroup of children, 62.2% stopped bottle-feeding at the same age interval.¹⁹ In our study, pacifier use was significantly higher in bottle-fed children, both in the case and in the control groups, and the children who were formula-fed had a significantly higher percentage of pacifier use in both the case and control groups.

There are some limitations to the present study. The research was initially carried out on a regional scale and may not be representative of the situation in other parts of Turkey. Socioeconomic levels were not studied in detail during our research, and upper socioeconomic levels may be under-represented.

In conclusion, use of pacifier in infancy was not related to the poor appetite that develops in later periods. It should be explained to mothers that early weaning from breastfeeding is a potentially negative effect of prolonged pacifier use, without leading to discouragement of such use. To gain an improved understanding, prospective studies with larger populations are required to examine the relationship between poor appetite and pacifier use.

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