Could the Use of Pacifiers in Infancy Be Associated with Binge Eating Disorder and Obesity in Adolescents?

Berna Eroglu Filibeli[1], Gulten Tuncerler[2], Gonca Ozyurt[3], Bumin Dundar[4] and Gonul Catli[5]

[1]*Department of Paediatric Endocrinology, Izmir City Hospital, Izmir, Turkiye*
[2]*Department of Paediatric Allergy and Immunology, Adnan Menderes University, Aydin, Turkiye*
[3]*Department of Child and Adolescent Psychiatry, Izmir Katip Celebi University, Izmir, Turkiye*
[4]*Department of Paediatric Endocrinology, Izmir Katip Celebi University, Izmir, Turkiye*
[5]*Department of Paediatric Endocrinology, Faculty of Medicine, Istinye University, Istanbul, Turkiye*

ABSTRACT

Objective: To explore the association between the use of pacifiers during infancy and the occurrence of binge eating disorder (BED) and obesity in adolescence.

Study Design: A case-control study.

Place and Duration of the Study: Department of Paediatric Endocrinology, Izmir Tepecik Training and Research Hospital, Izmir, Turkiye, from January 2022 to January 2023.

Methodology: One hundred thirty-seven obese adolescents, aged 12-18 years, with a body mass index (BMI) above the 95th percentile, and 123 healthy subjects, with a BMI between the 3rd-95th percentiles, who had a similar age and gender distribution, were included. A survey, including questions about feeding during the infantile period and oral habits (chewing gum, nail-biting, smoking, and substance use) in adolescence, was applied to the mothers of all participants. The presence of BED was evaluated according to DSM-5 diagnostic criteria.

Results: No significant difference was found between the obese and control groups regarding age, gender, and the use and duration of the pacifier. In the obese group, total breast milk intake period, night feeding after one year, nail-biting behaviour, and smoking rate were higher than in the control group ($p < 0.015$, $p < 0.001$, $p < 0.027$, and $p < 0.015$, respectively). BED was detected in 53.3% of the cases in the obese group ($p < 0.001$). There was no statistically significant difference between obese patients, with and without BED, in terms of the use and duration of pacifier ($p = 0.136$).

Conclusion: This study suggested that pacifier use in the infantile period (0-12 months) was not associated with oral habits, binge eating disorder, and obesity in adolescence. However, continuing night feeding (00-07 A.M, breast milk or formula) after one year of age may be related to obesity.

Key Words: *Childhood obesity, Pacifier, Binge eating disorder, Adolescents*.

How to cite this article: Filibeli BE, Tuncerler G, Ozyurt G, Dundar B, Catli G. Could the Use of Pacifiers in Infancy Be Associated with Binge Eating Disorder and Obesity in Adolescents?. *J Coll Physicians Surg Pak* 2025; **35(12)**:1574-1578.

INTRODUCTION

Childhood obesity is a growing concern for public health worldwide. Breastfeeding provides protection against obesity in both childhood and adulthood.[1] The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of a child's life. To maintain exclusive breastfeeding (EBF), the use of pacifiers, a common method to calm infants, is recommended to be avoided by the WHO, according to the WHO's Ten Steps to Successful Breastfeeding. Although pacifiers have been criticised for the early cessation of breastfeeding, research on the subject has reported conflicting results.[2]

Correspondence to: Dr. Berna Eroglu Filibeli, Department of Paediatric Endocrinology, Izmir City Hospital, Izmir, Turkiye
E-mail: bernafilibeli@gmail.com
....
Received: January 05, 2024; Revised: March 06, 2025; Accepted: October 29, 2025
DOI: https://doi.org/10.29271/jcpsp.2025.12.1574

Pacifier use has also been associated with orofacial structures, such as anterior open bite and posterior crossbite.[3] It has been suggested that pacifiers might have harmful effects on chewing functions owing to morphologic changes in the oral region.[3] On the other hand, the American Academy of Paediatrics recommends that parents consider offering pacifiers to infants aged one month and older at the onset of sleep to reduce the risk of sudden infant death syndrome (SIDS).[4] Few studies examining the effect of pacifier use on infant obesity revealed that the relationship between pacifier use and obesity remains unclear.[5,6]

Binge eating disorder (BED) is characterised by recurrent binge eating, involving the consumption of an amount of food that is larger than what others would eat under comparable circumstances within a particular time, and is associated with a feeling of loss of control over eating.[7,8] BED is also associated with overweight and obesity,[8] psychiatric disorders such as depression and anxiety,[9] and substance use.[10] Although many studies have noted that negative emotions or mood may play a role in binge eating, there is no clear evidence.[9] However, in a study evaluating the effectiveness of group therapy for women with

BED, it was reported that food acted as a pacifier when powerful emotions were present or during times of stress.[11]

The first stage of psychosexual development is the oral stage, according to Freud's psychosexual theory. It occurs between birth and 12 months, and an infant derives most of their pleasure from their mouth.[12] If the oral need is not met during the oral stage, developmental issues such as overeating, alcohol abuse, smoking, and nail-biting may emerge in later life.

Non-nutritive sucking is a natural reflex in infants, but the use of pacifiers to support this reflex may lead to changes in oral habits, eating disorders, and obesity. Research has shown that oral habits such as nail-biting,[13] chewing gum, smoking,[14] alcohol use, and binge eating[9] are common among obese individuals. Additionally, changes in chewing patterns (mastication) may be linked to nutritional status and contribute to weight gain. Given these factors, oral habits are thought to influence the development of obesity. This led to the hypothesis that pacifier use during infancy might be associated with BED and obesity in adolescence. The study aimed to investigate whether this relationship was connected to other oral habits, such as nail-biting, chewing gum, smoking, or alcohol use.

METHODOLOGY

A case-control study was conducted in the Department of Paediatric Endocrinology, Izmir Tepecik Training and Research Hospital, Izmir, Turkiye, from January 2022 to January 2023. The Local Ethics Committee of Training and Research Hospital for Interventional Clinical Studies approved the study in the light of the Helsinki Declaration (Approval No. 2022/01-28; dated: 17.01.2022). Written informed consent was also obtained from the parents of subjects before the study.

A qualitative-quantitative method adopting a transformative mixed-model research design was used.[15] G*Power program, version 3.1.9.2 for Windows, was used to calculate the sample size. Since there were no similar studies in the literature regarding the difference between two mean values at a moderate level, the effect size was taken as 0.5 (using Cohen's criteria), alpha as 0.05, and power as 0.90. Adding a 10-15% margin of error, the sample size was determined to be at least 121 subjects for each study group.

The study included 137 obese adolescents, aged 12-18 years, with a body mass index (BMI) above the 95th percentile, and 123 healthy subjects, with a BMI between the 3rd-95th percentiles, who had a similar age and gender distribution. Exclusion criteria for the obese group included syndromic obesity, endocrine disorders associated with obesity (such as hypothyroidism, Cushing's syndrome, hypothalamic obesity), chronic diseases, and the use of medication (such as systemic steroids). These conditions were excluded based on clinical and laboratory findings, including complete blood count, thyroid function tests, cortisol levels, and liver and renal function tests. Participants in the obese and control groups were randomly selected according to the inclusion criteria for both groups.

An experienced nurse performed anthropometric measurements of all adolescents. Height was measured using rigid wall-mounted stadiometers, which were calibrated consistently throughout the study. Weight was measured using a scale (SECA, Hamburg, Germany). Measurements were recorded to the nearest 0.1 centimetres (cm) for height and 0.1 kilogram (kg) for weight. The weight of each participant was measured with all clothing removed except undergarments. BMI was calculated by dividing weight (kg) by height squared (m^2). For calculating BMI percentiles and BMI-SDS (standard deviation score of BMI), data from the Centres for Disease control and Prevention (CDC) were used. Paediatricians (GC and BEF) conducted physical examinations and puberty evaluations. The findings for pubertal development were evaluated according to Tanner staging.

The authors developed a simple and comprehensive questionnaire based on the currently available literature.[9,16,17] The questionnaire consisted of 15 items (Yes/No, multiple-choice, and fill-in-the-blanks answers). The first section included four questions about gender, date of birth, physical evaluation, and parents' anthropometric measurements. It was filled by the physicians (GC and BEF). The second section was answered by a patient's mother. It had 11 questions regarding breastfeeding, traditional methods for weaning, pacifier and bottle use, speech impairment, and oral habits in adolescence. Night feeding was defined as the intake of breast milk or formula between 00:00 and 07:00 hours. In traditional weaning methods, mothers apply certain substances (tomato paste, pepper, hair, tape, and lipstick) to their breasts to terminate breastfeeding quickly.[17] Questions about oral habits aimed at querying chewing gum, nail-biting, and the use of smoking, alcohol, and foreign substances, which can lead to changes in masticatory function, nutritional status, and appetite balance.[16]

In the surveys, no identifiers were used to denote the identity of participants. The survey was performed face-to-face with all mothers. According to DSM-5 criteria, the child psychiatrist (GO) evaluated all participants for BED.

Statistical data analyses were conducted with SPSS version 24 (SPSS, Chicago, IL, USA). All values are presented as mean ± SD or median (25-75p) values. The distribution of data was evaluated with the Kolmogorov–Smirnov test. The Mann-Whitney U test was used to compare non-normally distributed data. Categorical variables were compared using the Chi-square test and expressed as counts and percentages. A value of $p < 0.05$ was considered statistically significant.

RESULTS

A total of 137 obese subjects (median age: 14.6 years) and 123 healthy subjects (median age: 15.2 years) were included. There were no significant differences between the groups regarding gender, birth weight, or gestational week. However, in obese adolescents, weight SDS, height SDS, BMI-SDS, and parents' BMI were higher than the healthy adolescents (Table I).

Table I: Demographic characteristics of adolescents.

Parameters	Obese group (n = 137)	Control group (n = 123)	p-values*
Birth weight (grams)	3300 (3000-3700)	3100 (3000-3500)	0.126
Gestational week	40 (39-40)	40 (38-40)	0.386
Gender (girl/boy)	92/45 (67.2%-32.8%)	78/45 (63.4%-36.6%)	0.527
Age (years)	14.6 (13.1-16.0)	15.2 (13.5-16.4)	**0.037**
Weight SDS	3.34 (2.5-4.0)	-0.42 (-1.0-0.3)	**<0.001**
Height SDS	0.3 (-0.39-0.94)	-0.25 (-0.8-0.4)	**<0.001**
BMI SDS (kg/m^2)	2.98 (2.49-3.42)	-0.32 (-1.02-0.37)	**<0.001**
BMI of mother (kg/m^2)	29.9 (25.6-33.9)	27.6 (25.3-31.1)	**0.008**
BMI of father (kg/m^2)	28.0 (26.1-31.4)	26.6 (24.2-29.4)	**<0.001**

*SDS: Standard deviation score; BMI: Body mass index; BMI-SDS: Standard deviation score of body mass index. Data are given as median (25-75p) values. *Mann-Whitney U test, Chi-square test.*

Table II: Infantile nutrition characteristics and oral habits of the groups.

Parameters	Obese group (n = 137)	Control group (n = 123)	p-values*
Exclusively breastfeeding period (months)	6.0 (4-6)	6.0 (4-7)	0.341
Breast milk intake period (months)	18 (12-24)	12 (9-18)	**0.015**
Traditional weaning methods	14.6% (n = 20)	21.1% (n = 26)	**0.033**
Pacifier use	38.7% (n = 53)	45.5% (n = 56)	0.264
Duration of pacifier use (months)	18 (12-24)	18 (11.5-30)	0.872
Bottle use	59.1% (n = 81)	63.4% (n = 78)	0.479
Night feeding after one year (breastfeeding or formula)	57.7% (n = 79)	43.9% (n = 54)	**<0.001**
Speech impairment	5.1% (n = 7)	10.6% (n = 13)	0.099
Chewing gum	52.4% (n = 33)	47.6% (n = 30)	0.955
Nail-biting	62% (n = 57)	38% (n = 35)	**0.027**
Experiencing an outburst	64.2% (n = 88)	60.2% (n = 74)	0.499
Smoking	16.8% (n = 23)	5.7% (n = 7)	**0.005**
Alcohol use	4.4% (n = 6)	0.8% (n = 1)	0.076
Substance use	1.5% (n = 2)	0% (n = 0)	0.179
Presence of BED	53.3% (n = 73)	0% (n = 0)	**<0.001**

*BED: Binge eating disorder. Data are given as median (25-75p) values. *Mann-Whitney U test, Chi-square test.*

Table III: Infantile nutrition characteristics and oral habits in the obese group according to BED status.

Parameters	Obese group (n = 137)		p-values*
	BED (n = 73)	Without BED (n = 64)	
Gender			0.067
Girls	60.3% (n = 44)	75% (n = 48)	
Boys	39.7% (n = 29)	25% (n = 16)	
Obesity in family members	69.9% (n = 51)	56.3% (n = 36)	0.099
Exclusively breastfeeding period (months)	6 (4-6)	6 (5-6)	0.449
Traditional weaning methods	21.9% (n = 16)	6.3% (n = 4)	**<0.001**
Breast milk intake period (months)	18 (12-24)	18 (12-24)	0.901
Pacifier use	32.9% (n = 24)	45.3% (n = 29)	0.136
Duration of pacifier usage (months)	21.5 (12-30)	16 (7-24)	0.159
Bottle use	57.5% (n 42)	60.9 % (n = 39)	0.686
Night feeding after one year (breastfeeding or formula milk)	54.8% (n = 40)	60.9% (n = 39)	0.364
Speech impairment	6.8% (n = 5)	3.1% (n = 2)	0.323
Chewing gum	20.5% (n = 15)	28.1% (n = 18)	0.301
Nail-biting	41.1% (n = 30)	42.2% (n = 22)	0.897
Experiencing an outburst	68.5% (n = 50)	59.4% (n = 38)	0.267
Smoking	21.9% (n = 16)	10.9% (n = 7)	0.086
Alcohol use	6.8% (n = 5)	1.6% (n = 1)	0.131
Substance use	2.7% (n = 2)	0% (n = 0)	0.182

*BED: Binge eating disorder. Data are given as median (25-75p) values. *Mann-Whitney U test, Chi-square test.*

While the EBF period was similar in both groups, the breast milk intake period was longer in the obese group. There were no significant differences in the use of pacifiers or bottles in both groups. However, traditional weaning methods were more common in the control group (p = 0.033). It was observed that night feeding after one year, nail-biting, and smoking cigarettes were more frequent in the obese group (p <0.001, p <0.027, and p <0.005, respectively). The BED rate was 53.3% in the obese group (p <0.001; Table II).

According to the presence of BED, infantile nutrition characteristics and oral habits in the obese group were presented in Table III. There was no difference between the obese patients with and without BED in pacifier use, pacifier initiation time, duration of use, and oral habits. However, traditional weaning methods were more common in the obese group with BED (p <0.001).

DISCUSSION

In this study, it was hypothesised that pacifier use during infancy might be more common in obese adolescents because pacifiers are associated with oral habits that could lead to BED. However, pacifier use was not different among obese and healthy adolescents (38.7% to 45.5%; p = 0.264). In obese adolescents, pacifier use was 38.7%, and it was lower than in healthy adolescents. However, the difference was not statistically significant. The International Child Care Practices Study reported that pacifier use varied from 12.5 to 71%.[18] A study showed that pacifier use was 37.8% in Turkiye.[19] The frequency of pacifier use was similar in the national data. Few studies evaluating the relationship between pacifier use and obesity mainly focused on infantile obesity, and their results are contradictory.[5,6] In one of them, pacifier use consistently for ≥9 months was associated with a lower incidence of obesity at 9 to 15 months of age, and the authors claimed that pacifiers could be protective against infantile obesity.[5] Another study interpreted that pacifier use in early infancy was related to accelerated infant growth and toddler overweight, as infants using a pacifier were more likely to be overweight at ages one year and two years.[6] A study investigating prolonged pacifier use and eating disorders in 3- to 7-year children found that the BMI percentile of pacifier users and non-user groups were similar.[19] Thus, it was concluded that pacifiers are not associated with obesity in childhood and adolescence, although they may play a role in early life.

This study showed that the presence of BED among adolescents in the obese group did not affect dietary characteristics. Additionally, pacifier use among obese adolescents with BED was similar to that of obese adolescents without BED. It can be concluded that pacifier use does not support the development of BED in obese adolescents. To the best of the authors' knowledge, it was the first study to evaluate pacifier use in obese adolescents with BED.

According to the published studies, the percentage of obesity in BED varies between 32.8 to 87.8%.[11,20] In the obese group, 53.3% of obese adolescents had BED, which is compatible with the literature. EBF and total breast milk intake time were shorter in obese children than in normal-weight children, and no breastfeeding is considered a risk factor for obesity.[1,21] In the study, EBF time was the same in obese and healthy adolescents. In contrast to the literature, the breast milk intake period of obese adolescents was significantly more extended than that of normal-weight adolescents (median duration 18 to 12 months; $p = 0.015$). Safe termination of breastfeeding is as essential as starting and maintaining breastfeeding. Since breastfeeding has a strong effect on the bond between mother and baby, it is emphasised that sudden and early termination of breastfeeding may cause trauma in the baby.[17] In a survey performed in eastern Turkiye, it was shown that most mothers (56.5%) used some traditional practices, instead of natural weaning.[17] This study showed that mothers of healthy adolescents used traditional weaning practices more frequently than mothers of obese adolescents (21.1% to 14.6%; $p = 0.033$). It might be related to the mothers' attitudes, and their babies were not ready to terminate breastfeeding because the total duration of breast milk intake was lower than in the obese group. Furthermore, the rates of traditional weaning methods were lower than those found in the survey performed in eastern Turkiye. The present study's population lives in the Egean region, a more developed part of the country. They might have been educated regarding breastfeeding by healthcare professionals, and their awareness level might be higher. These confounding elements suggest that obesity is a complex disease, and that multiple factors and biological triggers other than inadequate breastfeeding contribute significantly to its development.

Both weight status and parental feeding style strongly affect childhood obesity.[1] Parental obesity increases the risk of obesity in children.[1] Besides, it has been reported that night feeding and, consequently, shorter sleep contribute to infantile obesity, and that reducing night feeding leads to lower BMI.[22] According to a systematic review, short sleep duration is not only a risk factor for infants but also has a major impact on BMI in children and adolescents.[23] In this research, parents of obese adolescents had higher BMIs than those of healthy adolescents. The obese adolescents had a higher rate of night feeding after one year compared to the normal-weight adolescents. These findings suggest that infantile eating habits may play a role in weight status in later life.

Chronic nail-biting is very common in the population; however, it tends to be pathological in common eating disorders, such as anorexia nervosa and bulimia nervosa, as well as in obese patients.[13] In this study, nail-biting was more common in obese adolescents (62 to 38%; $p = 0.027$). However, when obese adolescents were grouped according to the presence of BED, no difference was observed in terms of nail-biting habits. Nail-biting may not be a common symptom of BED.

The coexistence of obesity and smoking has been reported in several studies.[14] Furthermore, psychiatric comorbidities, such as anxiety, mood, and substance use disorders, are prevalent in BED (10, 25).[9,24] In this study, obese adolescents smoked more than healthy peers (16.8 to 5.7%; $p = 0.005$). However, there were no differences between the BED-obese group and the non-BED-obese group in terms of smoking, alcohol consumption, and the use of other drugs. The study data about infant feeding and the use of pacifiers are based on the expressions of the mothers. Therefore, memory bias is the main limitation of the study.

CONCLUSION

Pacifiers, frequently used worldwide, are not associated with obesity and BED in adolescents. However, constant night feeding after one year can be one of the contributing factors to childhood obesity.

ETHICAL APPROVAL:
Ethical approval was obtained from the Local Ethics Committee of Izmir Tepecik Training and Research Hospital, Izmir, Turkiye (Approval No. 2022/01-28; dated:17.01.2022).

COMPETING INTEREST:
The authors declared no conflict of interest.

PATIENTS' CONSENT:
Written informed consent was obtained from all the participants and their legal guardians.

AUTHORS' CONTRIBUTION:
BEF, GT: Collected the data.
GO: Wrote the manuscript.

BD: Revised the manuscript.
GC: Revised the manuscript critically and supervised the whole study process.
All authors approved the final version of the manuscript to be published.

REFERENCES

1. Hampl SE, Hassink SG, Skinner AC, Armstrong SC, Barlow SE, Bolling CF, *et al*. Clinical practice guideline for the evalu- ation and treatment of children and adolescents with obesity. *Paediatrics* 2023; **151(2)**:e2022060640. doi: 10.1542/peds.2022-060640.
2. Hermanson A, Astrand LL. The effects of early pacifier use on breastfeeding: A randomised controlled trial. *Women Birth* 2020; **33(5)**:e473-82. doi: 10.1016/j.wombi.2019.10.001.
3. Scudine KGO, de Freitas CN, Nascimento de Moraes KSG, Bommarito S, Possobon RF, Boni RC, *et al*. Multidisciplinary evaluation of pacifier removal on oro-dentofacial structures: A controlled clinical trial. *Front Pediatr* 2021; **9**:703695. doi: 10.3389/fped.2021.703695.
4. Jullien S. Sudden infant death syndrome prevention. *BMC Pediatr* 2021; **21(Suppl 1)**:320. doi: 10.1186/s12887-021-02536-z.
5. Amer A, Abusamaan M, Li X, Fischer H. Does pacifier use in infancy decrease the risk of obesity?. *Clin Pediatr (Phila)* 2017; **56(11)**:1018-22. doi: 10.1177/0009922817701171.
6. Hohman EE, Savage JS, Birch LL, Beiler JS, Paul IM. Pacifier use and early life weight outcomes in the intervention nurses start infants growing on healthy trajectories study. *Child Obes* 2018; **14(1)**:58-66. doi: 10.1089/chi.2017.0177.
7. Kjeldbjerg ML, Clausen L. Prevalence of binge-eating disorder among children and adolescents: A systematic review and meta-analysis. *Eur Child Adolesc Psychiatry* 2023; **32(4)**: 549-74. doi: 10.1007/s00787-021-01850-2.
8. Nasrullah MH, Haider MJ, Arif M, Zahid MN, Iftikhar S, Mahmood S, *et al*. Eating disorders and disordered eating behaviors among undergraduate students in Pakistan as measured by eating disorder examination questionnaire (EDE-Q). *Cureus* 2024; **16(4)**:e59158. 2024. doi: 10.7759/cureus.59158.
9. Kessler RC, Berglund PA, Chiu WT, Deitz AC, Hudson JI, Shahly V, *et al*. The prevalence and correlates of binge eating disorder in the World Health Organization World Mental Health Surveys. *Biol Psychiatry* 2013; **73(9)**:904-14. doi: 10.1016/j.biopsych.2012.11.020.
10. Bahji A, Mazhar MN, Hudson CC, Nadkarni P, MacNeil BA, Hawken E. Prevalence of substance use disorder comorbidity among individuals with eating disorders: A systematic review and meta-analysis. *Psychiatry Res* 2019; **273**:58-66. doi: 10.1016/j.psychres.2019.01.007.
11. Seamoore D, Buckroyd J, Stott D. Changes in eating behaviour following group therapy for women who binge eat: A pilot study. *J Psychiatr Ment Health Nurs* 2006; **13(3)**: 337-46. doi: 10.1111/j.1365-2850.2006.00960.x.
12. Fornari V, Dancyger IF. Psychosexual development and eating disorders. *Adolesc Med* 2003; **14(1)**:61-75.
13. Halteh P, Scher RK, Lipner SR. Onychophagia: A nail-biting conundrum for physicians. *J Dermatolog Treat* 2017; **28(2)**: 166-72. doi: 10.1080/09546634.2016.1200711.
14. Chatkin R, Chatkin JM, Spanemberg L, Casagrande D, Wagner M, Mottin C. Smoking is associated with more abdominal fat in morbidly obese patients. *PLoS One* 2015; **10(5)**:e0126146. doi: 10.1371/journal.pone.0126146.
15. Creswell JW, Creswell JD. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th ed, Sage: Newbury Park, California, USA; 2017. Available from: https://www.scirp.org/reference/referencespapers?referenceid=2969274.
16. Pedroni-Pereira A, Araujo DS, Scudine KGO, Prado DGA, Lima DANL, Castelo PM. Chewing in adolescents with overweight and obesity: An exploratory study with behavioral approach. *Appetite* 2016; **107**:527-33. doi: 10.1016/j.appet.2016.08.122.
17. Gurarslan Bas N, Karatay G, Arikan D. Weaning practices of mothers in eastern Turkiye. *J Pediatr (Rio J)* 2018; **94(5)**: 498-503. doi: 10.1016/j.jped.2017.06.019.
18. Nelson EA, Yu LM, Williams S; International Child Care Practices Study Group Members. International Child Care Practices study: Breastfeeding and pacifier use. *J Hum Lact* 2005; **21(3)**:289-95. doi: 10.1177/0890334405278489.
19. Kaymaz N, Yıldırim S, Cevizci S, Bulur N, Topaloglu N, Binnetoglu FK, *et al*. Prolonged pacifier usage in infancy does not cause eating behavior problem later. *Turk J Pediatr* 2015; **57(5)**:487-91.
20. Aguera Z, Lozano-Madrid M, Mallorqui-Bague N, Jimenez-Murcia S, Menchon JM, Fernandez-Aranda F. A review of binge eating disorder and obesity. *Neuropsychiatr* 2021; **35(2)**: 57-67. doi: 10.1007/s40211-020-00346-w.
21. Ortega-Garcia JA, Kloosterman N, Alvarez L, Tobarra-Sanchez E, Carceles-Alvarez A, Pastor-Valero R, *et al*. Full breast-feeding and obesity in children: A prospective study from birth to 6 years. *Child Obes* 2018; **14(5)**:327-37. doi: 10.1089/chi.2017.0335.
22. O'Shea KJ, Ferguson MC, Esposito L, Hammer LD, Avelis C, Hertenstein D, *et al*. The impact of reducing the frequency of night feeding on infant BMI. *Pediatr Res* 2022; **91(1)**:254-60. doi: 10.1038/s41390-021-01397-7.
23. Miller MA, Kruisbrink M, Wallace J, Ji C, Cappuccio FP. Sleep duration and incidence of obesity in infants, children, and adolescents: A systematic review and meta-analysis of prospective studies. *Sleep* 2018; **41(4)**. doi: 10.1093/sleep/zsy018.
24. McCuen-Wurst C, Ruggieri M, Allison KC. Disordered eating and obesity: associations between binge-eating disorder, night-eating syndrome, and weight-related comorbidities. *Ann N Y Acad Sci* 2018; **1411(1)**:96-105. doi: 10.1111/nyas.13467.

• • • • • • • • • • •