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THE PROTECTIVE EFFECT OF EXCLUSIVE BREASTFEEDING ON PRESCHOOLERS' OVERWEIGHT AND OBESITY

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ABSTRACT

Background: The early years of life may be a particularly sensitive time when there is a rise in the range of body fatness levels. Overweight and obesity in 4- to 5-year-old children may be linked to the time of the adiposity rebound, when body mass index (BMI) rises from the childhood trough. **Objectives:** To assess the protective effect of breast milk on preventing preschool overweight and obesity among a sample of Mosul province in Iraq. **Patients and methods:** This is a cross sectional study conducted at Al Salam Teaching Hospital during the period from the first of April 2022 to the first of April 2024, all patients were randomly chosen. The study included 100 subjects with overweight and obesity, aged less than 6 years (cases), which were matched with another 100 subjects with normal weight and same age (controls). The questionnaire includes three parts, part one for sociodemographic information of the study participants. Part two for breast feeding information and part three for watching TV hours and attending kindergarten. **Results:** There were 200 patients included in this study 105 (52.5%) of them were boys and 95 (47.5%) of them were girls, with boy to girl ratio was (1.1/1). Comparison between case with overweight and obesity and those with normal weight regarding their sociodemographic information. No significant association and no statistically significant difference between the two groups regarding their gender, age, maternal age, current maternal work, family income and paternal educational level. But it's evidence that protective association and statistically significant difference between the two groups regarding their overall breast-feeding history, exclusive breast feeding for 6 months and 4 months. In contrast to bottle finding which is risky and statistically difference in case group in comparison to control group. Moreover, risky association and statistically significant difference between the two groups kindergarten attendance, but risky association with no significant difference for TV watch. **Conclusions:** Breastfeeding during infant's life especially within the first 4-6 months of life significantly reduces the risk of overweight and obesity among Iraqi preschool children.

KEYWORDS: Natural feeding, Overweight, Obesity, Preschool. Prevention, Pediatrics.

1- INTRODUCTION

Since the 1970s, childhood overweight and obesity have become a global epidemic.[1-2] Obesity can be start from infancy to adolescence and adulthood, and it is a major source of medical problems. Obesity has been linked to several chronic conditions in adults, including diabetes, stroke, ischemic heart disease, hypertension, and cancer.[3-4]

The early years of life may be a particularly sensitive time when there is a rise in the range of body fatness levels.[5] Overweight and obesity in 4- to 5 year old children may be linked to the time of the adiposity rebound, when body mass index (BMI) rises from the childhood trough.[6] Children with low birth weight (BW) tend to gain weight quickly, perhaps leading to obesity in adulthood.[7] Children with higher BW ranges had higher BMI in adulthood, indicating monitoring.[8] Several studies have shown that BW has a significant impact on growth status throughout childhood.[7-8] Additionally, many studies linked breastfeeding to childhood obesity.[9-10] However, the protective impact of breastfeeding on childhood obesity remains conflicting.

Furthermore, Breastfeeding is recommended for infants under 6 months due to its nutritional, immunological,

cognitive, emotional, economic, and environmental benefits.[11] Breast milk also includes a number of hormones, including ghrelin and leptin, which could play a role in controlling children growth and development. These hormones may also have an impact on how energy balance is regulated in both adults and children.[12] It is thought to be crucial to concentrate efforts on preventing childhood overweight and obesity as therapy has not been able to reverse the problem. Breastfeeding is a great and affordable way to do this goal.[13]

The aim of the study is to assess the protective effect of breast milk on preventing preschool overweight and obesity among a sample of Mosul province in Iraq.

2- PATIENTS AND METHODS

This is a case control study conducted at Al Salam Teaching Hospital during the period from the first of April 2022 to the first of April 2024, all patients were randomly chosen. The study included 100 subjects with overweight and obesity, aged less than 6 years (cases), which were matched with another 100 subjects with normal weight and same age (controls). Patients with unavailable information or those with chronic pathologies, and with a history of prematurity were excluded from the study. The questionnaire includes information about patients' gender, age, weight, height, economic status, current maternal work, parental education and obesity, TV hours, and kindergarten attendance. The nutritional diagnostic was based on WHO curves released in 2007.[14] Children under 6 years of age are classified as overweight if their weight for height falls between +1 and +2 standard deviations (SD) or between the 85th and 97th percentiles, and obese if their weight for height is > +2 DS or ≥ 97 percentile. The researchers made the nutritional diagnosis.

Analysis of data was carried out using the available statistical package of SPSS 30 (Statistical Package for Social Sciences-version 30). Data were presented in simple measures of frequency and percentage. Odds ratio (OR) is a measure of association between an exposure and an outcome. OR equal to one indicates "no association" between the exposure and the disease. If less than one indicates protective, if more than one indicates risk effect, if the 95% confidence interval for the OR does not contain one, then risky association between the exposure and disease can't reached. The significance of different percentages (qualitative data) was tested using chi-square test. Statistical significance was considered whenever the P value was less than 0.05.

3- RESULTS

There were 200 patients included in this study 105 (52.5%) of them were boys and 95 (47.5%) of them were girls, with boy to girl ratio was (1.1/1).

Table 3.1 shows comparison between case with overweight and obesity and those with normal weight regarding their sociodemographic information. No significant association and no statistically significant difference between the two groups regarding their gender, age, maternal age, current maternal work, family income and paternal educational level.

Table 3.1: Comparison between the cases and controls regarding their sociodemographic information.

Variable	Cases	Controls	Odds ratio (confidence interval)	P value
Gender				
-Male	57	51	1.273 (0.827-1.628)	0.394
-Female	43	49	Referent	
Age:				
- More than 4 years	61	52	1.443 (0.929-1.892)	0.199
- Less than 4 years	39	48	Referent	
Maternal age				
- Less than 35 years	67	62	1.244 (0.849-1.549)	0.495
- More than 35 years	33	38	Referent	
Current maternal work				
- Employee	31	42	Referent	0.106
- House wife	69	58	1.611 (0.889-2.291)	
Family income				
- Less than 250 thousand ID per person per month	60	64	0.843 (0.539-1.248)	0.560
- More than 250 thousand ID per person per month	40	36	Referent	
Paternal educational level				
- Illiterate	31	27	1.389 (0.783-1.568)	
- Primary	27	26	1.257 (0.829-1.467)	0.873
- Secondary	23	24	1.160 (0.591-1.320)	
- Higher	19	23	Referent	

Table 3.2 shows comparison between cases and controls regarding their breast-feeding history. It's evident that protective association and statistically significant difference between the two groups regarding their overall breast-feeding history, 6 months and 4 months exclusive breast feeding. In contrast to bottle finding which is risky

and statistically difference in case group in comparison to control group.

Table 3.2: Comparison between the cases and controls regarding their breast-feeding history.

Variable	Cases	Controls	Odds ratio (confidence interval)	P value
Exclusive breast feeding for 6 months:	21	73	0.098 (0.028-0.238)	<0.001
Exclusive breast feeding for 4 months:	29	65	0.219 (0.129-0.591)	<0.001
Mixed feeding:	38	63	0.359 (0.289-0.602)	<0.001
Bottle feeding:	77	48	3.626 (2.102-5.209)	<0.001

Table 3.3 shows comparison cases and controls regarding their TV watching hours and attending kindergarten. Risky association and statistically significant difference between the two groups kindergarten attendance, but risky association with no significant difference for TV watch.

Table 3.3: Comparison between the cases and controls regarding their watching TV hours and attending kindergarten.

Variable	Cases	Controls	Odds ratio (confidence interval)	P value
TV watch:				
- Less than 1 hour watch per day	22	15	**1.598 (1.084-1.879)**	0.671
- More than 1 hour watch per day	37	21	**2.209 (1.578-2.892)**	
Kindergarten attendance	41	21	**2.614 (1.789-3.329)**	**0.022**

4-DISCUSSION

The study main findings that, breast feeding is a protective factor against both overweight and obesity in preschool children. Moreover, the study found that preschool children had lower risk of overweight and obesity among those who exclusively breastfed for 6 and 4 months compared to those who received mixed feeding or formula. This is in agreement with different global studies.[15-16] The fact which promote a public health concern as breast milk contains bioactive factors that contribute to healthy growth and development, potentially influencing gene expression and metabolic pathways related to weight regulation. Additionally, breastfed infants also tend to develop better self-regulation of food intake compared to formula-fed infants, which can help prevent overfeeding and excessive weight gain.[15]

On the other hand, in spite of been not significant association or statistically not significant, overweight and obesity found in this study to be more prevalent in boys among preschool age group. This trend is not consistently observed across all studies and may vary depending on age and specific population. The inconsistent findings highlight the need for more research to better understand the factors contributing to overweight and obesity in preschool children, and to determine whether there are real differences in prevalence between boys and girls in this age group. Yu Zhang et al[17] and Antonela Matana et al[18] studies' findings. Potential contributing factors include differences in body composition between sexes, variations in eating habits, and differing activity levels. In same way those who aged more than 4 years found to have more overweight and obesity than children age less than 4 years. Studies consistently show that obesity prevalence rises as children get older. For example, one study of Australian children indicates that obesity prevalence increases from 12.7% among 2-5 years old to 20.7% among 6-11 years old and 22.2% among adolescents.[19] Moreover, overweight and obesity were found more frequently among preschool children whose mothers were younger than 35 years old, housewives, low income and low educational levels. The exact mechanisms linking these variables to childhood obesity are still being explored, highlighting the need for further study. However, Zahra Hassanzadeh-Rostami et al[20] and Emilio García García et al[21] showed comparable results.

The study found watching TV is risky for having overweight and obesity with proportional rate to the time of watching, which is consistent to Gang Zhang et al[22] and Adrián Nieto et al[23] studies' finding. This is due to impacting children with TV program can affected their social and physical activity as a result increase their weight.

Regarding children attendance to kindergarten, the study found it was risky for have childhood overweight and obesity (2.6 times) which is going with Meghan E McGrady et al[24] and Inyang A Isong et al[25] studies' findings.

5- CONCLUSIONS

Breastfeeding during infant's life especially within the first 4-6 months of life significantly reduces the risk of overweight and obesity among Iraqi preschool children.

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