ORIGINAL ARTICLE

Relationship between Infant Feeding and Obesity and Overweight in Young Adulthood

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Abstract

Objective: Overweight and obesity described as the most serious public health issues that can lead to long-term consequences .This study conducted to investigate whether breastfeeding has a preventing effect on the prevalence of overweight and obesity in adulthood.

Materials and Methods: This descriptive cross-sectional study was performed on students in Shahid Sadoughi University of Medical Sciences (n=300) in 2013. Data were collected through cluster sampling method. Data was collected via a researcher made checklist. Data was analyzed using descriptive statistics, t-test, chi square and ANOVA in SPSS-16 software.

Results: The mean (±Standard Deviation) of body mass index (BMI) of students were 21.91 ± 0.4 kg/m^2. The mean BMI of men was significantly higher than women**.** The prevalence of overweight and obesity was 16.7%. Based on the result, approximately 96.4% of the children had been ever breastfed; 11.1% of the children were breastfed for less than 6 months. Researcher found no association between the duration or exclusivity of breastfeeding and obesity and overweight in later life.

Conclusion: The results of our study did not show a significant association between the duration or exclusivity of breastfeeding and BMI in young adulthood**.**

Keywords: Bottle feeding, Breast feeding, Obesity, Overweight

Introduction

Overweight and obesity described as the most serious public health issues that can lead to long-term consequences (1). There is an obesity global epidemic and its prevalence is increasing in some areas (2). Obesity is a major risk factor for many chronic diseases, including type 2diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer (3). Also, Obesity and its complications account for great cost for health system (4).

The prevention of obesity is the best solution; so it is necessary to identify risk factors of obesity. Genetic predisposition, current lifestyle and events during early life are the important determinant of obesity risk in later years (2). Unhealthy nutrition (increasing intake of energy-dense foods, high in sugar and fat) and sedentary lifestyles with limited

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physical activity are two important risk factors of obesity.

The infant feeding practices may be related to obesity and overweight and increase risks of some disease in adult life (5). Breast milk is an unique nutritional source and has beneficial effects for children include a lower risk for ear and respiratory infections, atopic dermatitis, gastroenteritis, necrotizing enter colitis, type 2diabetes, and sudden infant death syndrome. Beneficial effects for mothers include decreased risk of breast and ovarian cancer and type 2diabetes (6).

Difference in the composition of breast milk and formula milk (such as the sodium and fatty acid content) may have impact on later life obesity (7). Bioactive factors in the milk, a lower energy intake and a lower protein intake may relate to the lower obesity risk in people who were fed with breast milk (2).

A recent meta-analysis showed that over short follow-up periods, breastfeeding may have a direct influence on preventing overweight development, while energy and protein intake during infancy might be related with weight and height attained in later years (5).

Recently, some studies have been conducted to evaluate the effect of breastfeeding on later life obesity (4). Some studies showed that breastfeeding may have a preventing effect on obesity (8-10). Also, there is a time dependent relationship between duration of breastfeeding and obesity (11,12) but more recent studies have reported null effects (13,14). There are many conflicting studies about the effects of breastfeeding on later obesity in childhood and Adolescence. Factors affecting the choice of breastfeed are associated with education, income level, culture, influence of family and friends, and these variables are also associated with risk for adult obesity.

If a relationship between infant feeding and later obesity risk is confirmed, may have an impact for breastfeeding promotion policy; this may be a valuable opportunities to parents for the prevention of obesity in their children during childhood and adolescence.

This study conducted to investigate whether breastfeeding has a preventing effect on the prevalence of overweight and obesity in later life.

Materials and Methods

This descriptive-analytic study was conducted in Yazd-2013 to examine the infant nutrition feeding and overweight and obesity in young adulthood. The sample size was calculated as 300 students of Shahid Sadoughi University of Medical Sciences based on a confidence interval of 95%, a correlation coefficient r=0.3 between duration of breastfeeding and obesity and overweight and test power equivalent to 80%.

Data were collected through cluster sampling method, 15 clusters and 15 students from each cluster were selected from five faculties of Shahid Sadoughi University of Medical Sciences. Clusters were involved by considering academic discipline and entrance year. Inclusion criteria for participant were older than 18 years and agreement to participate. Also, participants who had not responded to all questions and non-native people were excluded from this study.

The data were collected by a researcher made checklist. The interview began with demographic variables including; sex, age, height, weight and history of other chronic diseases. Body mass index (BMI) was calculated as weight/height2 (kg/m2). BMI classification was including: Underweight (<18.50), Normal range (18.50 - 24.99), Overweight (25.00 - 29.99), Obese (≥30.00). Then the other questions were asked about infant feeding, duration of breastfeeding and the starting time of supplementary feeding. The answers to these questions were based on maternal recall of infant feeding practices. Statistical analyses were performed using SPSS-16. The analysis included: descriptive statistics (mean and standard deviation (SD)), T-test and analysis of variance (ANOVA), chi square tests for testing the significance of difference for nominal variable and Pearson's correlation for assessing the relationship

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between variables. The 5% level of statistical signify cance was considered.

Results

The mean (±SD) age of participants was 23±1.1 years. The mean (±SD) BMI of students were 21.91 ± 0.4 kg/m^2. The mean BMI of men was significantly higher than that of women (*P*-value<0.001); the mean BMI was 23.86 ± 0.3 for men and 20.93 ± 0.9 for women. BMI classification frequency in students was: underweight (14.3%), normal range (69%), overweight and obese (16.7%). The results of Pearson correlation showed that there was a positive significant correlation between age and BMI. (*P*-value=0.004)

Based on the result, approximately 96.4% had been ever breastfed, 3.7% (11 people) were fed with formula milk and 35.7% (107 people) with both formula and breast milk. Also, according to Table 1, most of participants (63.5%) were breastfed for up to two years, and only 11.1% were breast fed for less than 6 months. Duration of formula milk in most of participants (41.5%) was 6-12 month after birth.

Table 2 shows the frequency distribution of BMI based on duration of formula milk. Regarding the relationship between the start of feeding with formula milk and normal BMI in adolescent, the following results were achieved: 84.4% of participants with normal BMI started feeding when they were less than 3 months of age. But the results did not show an association between BMI and introduction time of formula milk.

The mean (±SD) BMI were 21.91±0.4 for people who were breastfed, 21.49 ± 0.6 for people who were fed with formula milk and 21.96± 0.3 for people were fed with both formula and breast milk. (*P*-value=0.35)

According to ANOVA test, people who were breastfed less than 3 months had the lowest BMI and the people who were breastfed more than 2 years had the highest BMI (*P*-value=0.47). But researcher found no association between the duration or exclusivity of breastfeeding and obesity in later life.

Discussion

The present study was conducted to determine the association between infant breastfeeding and overweight and obesity in young adulthood. The results showed that the mean BMI was 21.91 which were in the normal

Table 1. Demographic characteristics of study participants

Variables		Frequency	%
Gender	Male	100	33.3
	Female	200	66.7
Infant feeding	Breast milk	182	60.7
	Formula milk	11	3.7
	Both	107	35.7
Duration of breastfeeding	<3 month	17	5.9
	3-5 month	15	5.2
	6-12 month	48	16.7
	12-24 month	183	63.5
	>24 month	25	8.7
The introduction time of formula milk	<3 month	32	27.1
	3-5 month	25	21.2
	6-12 month	49	41.5
	>12 month	12	10.2

Table 2. BMI based on the introduction time of formula milk

the introduction time of formula milk	BMI			*P*-value
	Underweight	Normal	Overweight & obesity	
<3	3(9.4%)	27(84.4%)	2(6.2%)	0.23
3-5	0(0%)	19(76%)	6(24%)	
6-12	5(10.2%)	31(63.3%)	13(26.5%)	
>12	1(8.3%)	8(66.7%)	3(25%)	

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range. The prevalence of overweight and obesity was 15.7% and 1% respectively. Review of other studies showed that the prevalence of obesity and overweight in the students was less than 20%. The prevalence of overweight and obesity in students of Rafsanjan University of Medical Sciences, Tehran and Sharif University was 12.1%, 16.7% and 19.29 % respectively (15-17).

In our study, mean BMI in males was significantly higher than females. The prevalence of obesity and overweight was also higher in men than females in Mohammadi et al study (18) other studies have confirmed this issue (15,16). In this study, males mean age was higher than females. BMI increased with aging; perhaps because the prevalence of obesity was higher in men. Also, this may be due to poor eating habits in men.

In this study, there was a positive relationship between age increase and high BMI. It was consistent with other studies (15,16).

Results showed no significant relationship between breastfeeding and BMI in later life. Ravelli et al. represented that BMI in adulthood was not influenced by the type of feeding in infancy (19). In this study, People who were breastfed for less than 3 months had the lowest BMI; Also, People who were breastfed for more than 2 years had the highest BMI. But the results did not show an association between BMI and total duration of breastfeeding; it was consistent with other studies (20-22). Some studies have not confirmed the protective effect of breastfeeding against obesity in later life (23). Even a study showed that the risk of obesity increases with increasing duration of breastfeeding (24). According to Brion & colleagues' study, previous reports have shown a relationship between breast feeding and BMI, are likely to be influenced by confounding factors (25). Owen et al. did not show an association between BMI and breastfeeding after controlling confounding factor such as socio-economic factors, maternal smoking during pregnancy and Parents' Obesity (7). Also, Razae et al. indicated that effect of Breastfeeding on the side of confounding variables can have an impact on children's weight (26). A limitation of this study is reliance on maternal recall of infant-feeding practices.

The results of our study did not show a significant association between the duration or exclusivity of breastfeeding and BMI in later life. Perhaps, the result of previous studies have shown a relationship between breast feeding and BMI, are likely to be influenced by confounding factors. Also, variables that were not measured in our study, such as genetics, culture, environmental factors and socio-economic factors may effect on the relationship between breastfeeding and obesity and overweight in adulthood.

Conclusions

The results of this study did not show a significant correlation between the duration or exclusivity of breastfeeding and obesity and overweight in young adulthood. Perhaps, the factors such as genetics, culture, environmental factors and socio-economic factors that were not measured in this study influence the relationship between breastfeeding and blood obesity and overweight in young adulthood.

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