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Eating Attitude, Nutrition Knowledge and Behaviors Among Female Preschool Teachers in İstanbul: A Cross-Sectional Study

İstanbul'da Kadın Okul Öncesi Öğretmenlerinin Yeme Tutumu, Beslenme Bilgi Düzeyi ve Davranışları: Kesitsel Bir Araştırma

Elif EMİROĞLU[a], Mutlu Tuçe ÜLKER[a], Funda ELMACIOĞLU[a]

[a]Department of Nutrition and Dietetics, İstinye University Health Sciences Faculty, İstanbul, Türkiye

ABSTRACT Objective: The aim of this study is to determine the eating attitude, nutritional knowledge and behaviors of preschool teachers. **Material and Methods:** This descriptive cross-sectional study was conducted with the participation of 709 female preschool teachers working in 174 private kindergartens in İstanbul between May 17-31, 2021. The questionnaire form was applied to the participants face to face; the age information and body weight and height measurements of the individuals were recorded. Nutritional knowledge levels of the participants were evaluated with the Nutrition Knowledge Level Scale, their eating attitudes were evaluated with the Eating Attitudes Test 26 and their nutritional behaviors were evaluated with the Three-Factor Eating Questionnaire. The data were analyzed with the SPSS and $p<0.05$ was considered statistically significant. **Results:** The body mass index of 29.6% of the teachers is outside the range of 18.5-24.9 kg/m^2. Only 35.7% of individuals have a good/very good level of nutrition knowledge; it was determined that 13.8% of the participants had an impaired eating attitude. As the age of teachers increases, the level of nutrition knowledge increases, food selection develops positively and uncontrolled eating behavior decreases; however, body weight, body mass index and some feeding behaviors (emotional eating and cognitive restriction) increased. **Conclusion:** It has been determined that the nutritional knowledge level of teachers, which is one of the important factors in the development of healthy eating behaviors in preschool children, is not at a sufficient level, and this may be related to negative results in eating attitudes and behaviors.

Keywords: Pre-school teachers; nutrition; attitude; knowledge; behavior

ÖZET Amaç: Bu araştırmanın amacı, okul öncesi öğretmenlerinin yeme tutumu, beslenme bilgi düzeyi ve davranışlarının belirlenmesidir. **Gereç ve Yöntemler:** Kesitsel, tanımlayıcı tipteki bu çalışma, 17-31 Mayıs 2021 tarihleri arasında, İstanbul ilinde yer alan 174 özel anaokulunda görev yapmakta olan 709 kadın okul öncesi öğretmeninin katılımı ile gerçekleştirilmiştir. Anket formu katılımcılara yüz yüze uygulanmış olup; bireylerin yaş bilgileri ile vücut ağırlığı ve boy uzunluğu ölçümleri kaydedilmiştir. Katılımcıların beslenme bilgi seviyeleri Beslenme Bilgi Düzeyi Ölçeği ile yeme tutumları Yeme Tutum Testi 26 ile beslenme davranışları ise Üç Faktörlü Yeme Anketi ile değerlendirilmiştir. Veriler SPSS programı ile analiz edilmiş ve $p<0,05$ istatistiksel olarak anlamlı kabul edilmiştir. **Bulgular:** Araştırmaya katılan öğretmenlerin %29,6'sının beden kitle indeksi 18,5-24,9 kg/m^2 aralığı dışındadır. Bireylerin sadece %35,7'sinin beslenme bilgi düzeyi iyi/çok iyi seviyede olup; katılımcıların %13,8'inde bozulmuş yeme tutumu olduğu belirlenmiştir. Öğretmenlerde yaş arttıkça beslenme bilgi seviyesi artmakta, besin seçimi olumlu yönde gelişmekte ve kontrolsüz yeme davranışı azalmaktadır; ancak vücut ağırlığı, beden kitle indeksi ve bazı beslenme davranışları (duygusal yeme ve bilişsel kısıtlama) artmaktadır. **Sonuç:** Okul öncesi çocuklarda sağlıklı beslenme davranışlarının geliştirilmesinde önemli etkenlerden biri olan okul öncesi öğretmenlerinin beslenme bilgi seviyelerinin yeterli düzeyde olmadığı, bu durumun da yeme tutum ve davranışlarındaki olumsuz sonuçlarla ilişkili olabileceği belirlenmiştir.

Anahtar Kelimeler: Okul öncesi öğretmenleri; beslenme; tutum; bilgi; davranış

Adequate and balanced nutrition are among the most important determinants of lifelong health and provide the necessary nutritional components for optimal growth and development in childhood. Nutritional habits and behavior in childhood can be sustained in adulthood and may affect health in later stages of life. Nutrition education is critical to developing healthy eating behavior at an early age.[1] The opinion report published by the Academy of Nutrition and Dietetics, Society for Nutrition Education

Correspondence: Mutlu Tuçe ÜLKER
İstinye Üniversitesi Sağlık Bilimleri Fakültesi, Beslenme ve Diyetetik Bölümü, İstanbul, Türkiye
E-mail: mutlu.ulker@istinye.edu.tr

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and Behavior and School Nutrition Association in 2018 explains the importance of nutrition programs and interventions targeting children in age groups from preschool to high school. The report recommends that nutrition education, an important component of comprehensive school nutrition programs, be integrated into compulsory and/or elective courses or presented as an independent curriculum; and it highlights the necessity of coordinating the work of teachers and parents in the development and implementation of nutrition education curriculum and materials.[2] The 2018 practice report of the Academy of Nutrition and Dietetics examined nutrition programs and services in schools and reported that teachers did not receive sufficient incentives in this regard and that lesson hours were insufficient to accomplish what was necessary. The report emphasized that dietitians, who use their skills in nutrition program management, food service management, community nutrition and nutritional care, are the most competent occupational group in managing school nutrition programs.[3] A systematic review of nutrition education interventions (2018) showed factors increasing the effectiveness of nutrition education in preschool children to include predetermining the nutritional behaviors that must be changed, implementing purposefully planned activities, involving parents, introducing age-appropriate activities, designing short but frequent sessions to adapt to children's short attention spans, and training teachers at school.[1]

In the preschool period, children spend most of their time in kindergartens. It is thought that kindergarten teachers or institutional staff lack knowledge of nutrition and may trigger insufficient/excessive food consumption and junk food choice during this period.[4] Kindergarten teachers play an important role in health promotion, nutrition education and prevention of childhood obesity, and teachers' nutrition and health behavior can have an impact on children's behavior.[5] Health and nutrition education for teachers may improve children's nutritional behavior and food choices, reducing the risk of developing non-communicable diseases related to nutrition in the later stages of their lives.[6,7]

In order to plan an effective nutrition education for kindergarten teachers, it is first necessary to determine the needs of the target group in this regard. The aim of this study is to determine the eating attitude, nutritional knowledge and behaviors of preschool teachers.

MATERIAL AND METHOD

STUDY DESIGN

This descriptive cross-sectional study was conducted between May 17-31, 2021. The research includes female preschool teachers who are actively working in İstanbul, and the sampling method is simple random sampling. Female individuals during pregnancy and lactation were not included in the study. The reasons for limiting the research to İstanbul is that the province has the highest population in Türkiye (18.49% of the total population of the country), with 50.1% of the total population being male and 49.9% being female, and the city hosts populations with different socio-cultural characteristics.[8] According to National Education Statistics' 2019-2020 data, the total number of institutions providing preschool education in İstanbul is 4,181 and the number of private institutions is 2,546.[9] The sample size was targeted to be at least 5% (127) of the number of private institutions, and in this context, the research was carried out with the participation of a total of 709 preschool teachers working in 174 private kindergartens serving 33 different districts of İstanbul.

DATA COLLECTION

Research data were collected through a questionnaire form in face-to-face interviews. The questionnaire form consists of four parts (Part 1-Age and Anthropometric Measurements, Part 2-Nutrition Knowledge Level, Part 3-Eating Attitudes, Part 4-Nutritional Behaviors).

Age and Anthropometric Measurements

Part 1 includes age information, measurements of body weight, height, and body mass index (BMI) value and classification. Body weight was measured by the researcher using a scales and height was measured with a non-stretchable measuring tape.[10] BMI, which is used practically in the clinic, was calculated by the researcher with this formula: BMI=body weight (kg)/height^2 (m^2). BMI is classified according to World Health Organization standards (Table 1).[11]

TABLE 1: WHO body mass index classification.

BMI (kg/m²)	Nutritional status
<18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Pre-obesity
30.0-34.9	Obesity class I
35.0-39.9	Obesity class II
<40	Obesity class III

WHO: World Health Organization; BMI: Body mass index.

Nutrition Knowledge Level

The nutrition knowledge levels of the participants were evaluated with the Nutrition Knowledge Level Scale (NKLSA), developed by Batmaz in 2018. The scale consists of 2 parts (nutrition knowledge level and food choice). The first section measures the basic nutrition knowledge level of the individual; a maximum of 80 points can be obtained from this section. The 2nd section evaluates the nutritional preferences of individuals; a maximum of 48 points can be obtained from this section. In the first section, scores below 45 points are considered poor, between 45-55 points are considered moderate, scores between 56-65 points are considered good, and scores above 65 points are considered very good. In the second section, scores below 30 points are considered poor, between 30-36 points are considered moderate, between 37-42 points are considered good, and above 42 points are considered very good.[12]

Eating Attitudes

The Eating Attitudes Test (EAT) developed by Garner and Garfinkel in 1979 is used in many countries. The purpose of the scale is to determine risky eating attitudes.[13] The adaptation of the 26-item form of the scale (EAT-26) to Turkish and its validity-reliability study were carried out by Erguney-Okumus and Sertel-Berk in 2020. EAT-26 consists of 3 parts: a-demographic data (7 questions), B-eating habits (26 questions), and C-eating behavior (5 statements). Scores of 20 and above from part B of the scale indicate a deterioration in eating attitudes.[14]

Nutritional Behaviors

Nutritional behaviors of individuals were evaluated with the Three-Factor Eating Questionnaire (TFEQ-R18). TFEQ-R18, developed by Stunkard and Messick and revised by Karlsson et al., has been translated into Turkish by Kıraç et al., and its validity and reliability have been proven. The scale, which examines uncontrolled eating, cognitive restriction, and emotional eating behavior, consists of a total of 18 items and has a 4-point Likert-type rating (1, absolutely true; 2, mostly true; 3, mostly false; and 4, absolutely false).[15,16]

ETHICAL CONSIDERATIONS

Application permission was obtained from all institutions where the research would be conducted, and all participants were informed about the study and their written consent was obtained. Ethics committee approval was obtained from İstinye University Social and Human Research Ethics Committee (date: May 06, 2021, meeting number: 2021/08; decision no: 03). This study was conducted in accordance with the Declaration of Helsinki.

STATISTICAL EVALUATION

The data obtained from the questionnaire was analyzed using the SPSS 22.0 package program (IBM SPSS Statistics for Windows, Version 22.0, USA). Arithmetic mean, standard deviation, minimum and maximum values are given for continuous variables; number and percentage values are given for categorical variables. The normal distribution of the data was evaluated with the Shapiro-Wilk test and the possible relationships between the data that did not show normal distribution were analyzed with the Spearman correlation test. Data with a p value below 0.05 was considered significant.[17]

RESULTS

This study was carried out with the participation of a total of 709 female individuals and the average age of the participants was 29.61±7.32. When the participants were classified according to their BMI, it was determined that 17.8% of the individuals were overweight and 4.8% were obese/morbidly obese (Table 2).

According to the results obtained from NKLSA, only 35.7% of the participants have good/very good nutrition knowledge level, and 69.9% of them demonstrate good/very good food choice.

According to the data obtained from EAT-26, 13.8% of the participants had deterioration in their eating attitudes (Table 3).

According to the data obtained from EAT-26, it was reported that 12% of the participants lost 9 kg or more in the last 6 months. 44.7% of the participants experienced binge eating attacks at least once, 3.1% made themselves vomit at least once to control their body weight, 6.6% used laxatives, diet pills or diuretics at least once. 46.3% exercised at least once a day for more than 60 minutes during this period (Table 4).

Correlations between age and body weight and NKLSA, EAT-26 and TFEQ-R18 scores were examined in order to determine the nutritional education/counseling needs of teachers with different ages or body weights. Each participant's body weight was associated with emotional eating, uncontrolled eating and cognitive restriction (p=0.00 and r=0.15; p=0.005 and r=0.11; p=0.005 and r=0.19, respectively), and their age was associated with body weight, BMI, nutritional knowledge level, food choice, uncontrolled eating and cognitive restric-

TABLE 2: Some socio-demographical characteristics and anthropometric measurements of the participants (n=709).

	Value
Age [years; mean±standard deviation (minimum-maximum)]	29.61±7.32 (22-69)
Body weight [kg; mean±standard deviation (minimum-maximum)]	61.05±10.21 (39.5-135)
Body height [m; mean±standard deviation (minimum-maximum)]	1.64±0.06 (1.45-1.80)
BMI [kg/m^2; mean±standard deviation (minimum-maximum)]	22.83±3.68 (15.94-45.63)
BMI classification [n (%)]	
Underweight (<18.5 kg/m^2)	50 (7.1%)
Normal (18.5-24.9 kg/m^2)	499 (70.4%)
Overweight (25.0-29.9 kg/m^2)	126 (17.8%)
Obese (30.0-39.9 kg/m^2)	32 (4.5%)
Morbidly obese (>40.0 kg/m^2)	2 (0.3%)

BMI: Body mass index.

TABLE 3: Data on nutrition knowledge, eating attitudes and behaviors of the participants (n=709).

	Value
NKLSA (nutrition knowledge level) [mean±standard deviation (minimum-maximum)]	53.6±6.8 (31-75)
NKLSA (nutrition knowledge level) [n (%)]	
Poor (below 45)	59 (8.3%)
Moderate (45-55 points)	397 (56.0%)
Good (56-65 points)	216 (30.5%)
Very good (above 65)	37 (5.2%)
NKLSA (food choice) [mean±standard deviation (minimum-maximum)]	39.2±5.4 (23.0-48.0)
NKLSA (food choice) [n (%)]	
Poor (below 30)	30 (4.2%)
Moderate (30-36 points)	183 (25.8%)
Good (37-42 points)	271 (38.2%)
Very good (above 42)	225 (31.7%)
EAT-26 [mean±standard deviation (minimum-maximum)]	11.0±9.9 (0-75)
EAT-26	
Below 20 points	611 (86.2%)
20 points and above	98 (13.8%)
TFEQ-R18 (uncontrolled eating) [mean±standard deviation (minimum-maximum)]	34.9±21.0 (0-100)
TFEQ-R18 (emotional eating) [mean±standard deviation (minimum-maximum)]	39.5±30.8 (0-100)
TFEQ-R18 (cognitive restriction) [mean±standard deviation (minimum-maximum)]	49.7±19.6 (0-100)

NKLSA: Nutrition Knowledge Level Scale; TFEQ-R18: Three-Factor Eating Questionnaire-Revised 18; EAT-26: Eating Attitude Test-26.

TABLE 4: Some data on participants' eating attitudes (n=709).

	Value [n (%)]
Have you ever had binge eating episodes that you felt you couldn't stop?	
Never	392 (55.3%)
Once a month or less	194 (27.4%)
Twice-three times a month	64 (8.9%)
Once a week	33 (4.7%)
Twice-six times a week	16 (2.3%)
Once a day or more	10 (1.4%)
Have you made yourself vomit to control your weight and body shape?	
Never	687 (96.9%)
Once a month or less	12 (1.7%)
Twice-three times a month	3 (0.4%)
Once a week	4 (0.6%)
Twice-six times a week	0 (0%)
Once a day or more	3 (0.4%)
Have you used laxatives, diet pills or diuretics to control your weight and body shape?	
Never	662 (93.4%)
Once a month or less	21 (3%)
Twice-three times a month	9 (1.3%)
Once a week	6 (0.8%)
Twice-six times a week	4 (0.6%)
Once a day or more	7 (1%)
Have you exercised more than 60 minutes a day to lose or control your weight?	
Never	381 (53.7%)
Once a month or less	137 (19.3%)
Twice-three times a month	49 (6.9%)
Once a week	62 (8.7%)
Twice-six times a week	66 (9.3%)
Once a day or more	14 (2.0%)
Have you lost more than 9 kg in the past 6 months?	
Yes	85 (12%)
No	624 (88%)

tion (p=0.00 r=0.25; p=0.00 r=0.27; p=0.001 r=0.13; p=0.00 r=0.17; p=0.02 r=-0.09; p=0.01 r=0.10, respectively) (Figure 1, Figure 2).

DISCUSSION

This cross-sectional study was carried out to examine the eating attitude, nutrition knowledge and behaviors of female preschool teachers.

The KAP (knowledge, attitude and practice) model is implemented to provide health-related behavioral changes. This model aims to improve knowledge and change attitudes and behaviors in order to reduce the economic burden and social effects of disease. A cross-sectional study evaluating the KAP of teachers working in kindergartens in Chongqing, China (2018) considered 222 kindergarten teachers in 80 kindergartens and found that only 54.2% of the participants had a limited nutrition knowledge.[18] Similarly, to determine the knowledge level of preschool teachers about childhood nutrition and the factors affecting it, another study included 200 teachers working in 40 private preschool institutions. In this study asked them 20 questions about child nutrition, then showed the mean score of the teachers to be 69.85±16.34, with the mean score of female teachers higher than that of male teachers. The study reported that the scores of the teachers increased with age and duration of professional experience. Evaluation of the nutrition knowledge levels of the teachers found that 16.5% of the teachers had sufficient, 70.0% had moderate, and 13.5% had insufficient nutrition knowledge.[19] These results were consistent with the results from our studies. Our study evaluated teachers' nutrition knowledge levels with NKLSA and determined that only 35.7% of the teachers had a

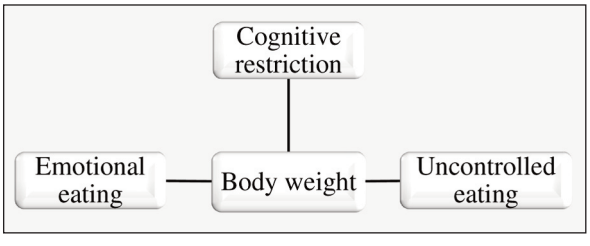

FIGURE 1: The relationship of body weight with some eating behaviors (continuous lines indicate positive correlations).

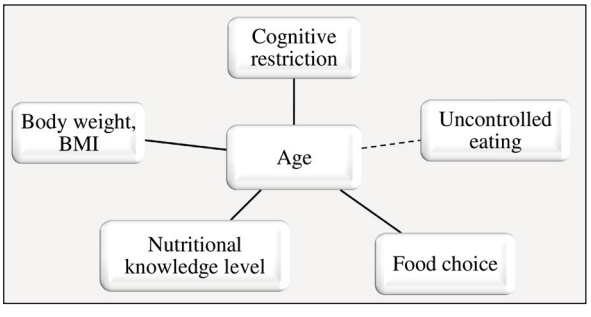

FIGURE 2: The relationship between age and eating behaviors/nutritional knowledge level (continuous lines indicate positive correlations, dashed line indicates negative correlation). BMI: Body mass index.

good/very good level of nutrition knowledge. This data reveals that teachers need education on nutrition.

A study conducted by Shaaban et al. in 2014 included a total of 150 preschool teachers from private and public schools, evaluating their nutrition knowledge level, eating attitudes and behaviors before and after nutrition education was introduced. The study showed that the nutrition knowledge level of private school teachers was at first better than that of the teachers working in public schools. However, by the end of the study, the nutrition education program had increased the level of nutrition knowledge and elicited positive behavioral changes in all the teachers, and the difference between teachers working in private and public institutions had disappeared.[20] Only teachers working in private institutions participated in our study. This indicates that the need for nutrition education of all teachers in the province may be even higher.

Interventions are needed to minimize health inequalities and prevent obesity, especially in groups with low socioeconomic status. Preschool educational institutions are important environments for these interventions. Early childhood education and care programs in kindergartens can promote healthy eating and physical activity. In 2019, Toussaint et al. randomly divided 41 kindergartens and teachers, students and parents working at these institutions serving to the low socioeconomic group in the Netherlands into control and intervention groups. The intervention group received 9 months of training on healthy eating practices and physical activity. As a result of the study, positive changes in knowledge, attitude and behavior related to healthy nutrition and physical activity were observed in the intervention group.[21] A 2019 study conducted by Cooper et al., aimed to examine the nutrition knowledge, attitudes and behaviors of preschool teachers and their mealtime practices. The study included kindergartens serving children of low socioeconomic status families in New York. A total of 660 teachers participated in the research; 420 teachers received nutrition education and 240 teachers did not. The research found that the teachers who received nutrition education scored higher than the teachers who did not receive the education and that the teachers stuck to the mealtime practices. It was concluded that with the increase in the years of experience of the teachers, compliance with mealtime practices and level of nutrition knowledge also increased.[22] The results of our research showed the negativities in the nutrition attitudes and behaviors of teachers. Considering the data of these studies, it reveals the importance of nutrition education to be given to the target audience.

People who are overweight are more likely to experience nutrition-related health problems. A 2018 study conducted by Liu et al. showed that overweight teachers had the highest level of nutritional knowledge, indicating that these participants had a certain level of but insufficient knowledge about nutrition to change their unhealthy lifestyles. The study revealed that kindergarten teachers learn more about nutrition as they get older.[18] Our study's results reveal that with increasing age, teachers demonstrate an increased level of nutrition knowledge, improvements in food choice and decreased uncontrolled eating behavior decreases; however increasing age brings about an increase in body weight and BMI, emotional eating and cognitive restriction. In addition, as body weight increases, emotional eating, uncontrolled eating and cognitive restriction increase in teachers. This data can guide the content and targets of nutrition education programs planned for teachers of varying age groups or different body weights.

The strengths of this study are that the research sample is large and there are limited studies in the literature evaluating the nutrition knowledge, eating patterns and behaviors of preschool teachers. It is thought that our study, which is known to be the first study of its kind in our country, will support other future studies and determine the goals of nutritional interventions to be applied to teachers. Yet this study is not without limitations. First, data obtained with a cross-sectional method did not permit the causality of results to be determined. Second, only teachers working in private institutions were included in this study; there is a need to study preschool teachers working in public institutions.

CONCLUSION

Studies focusing on preschool teachers can play an important role in the development of healthy eating behaviors, protection/improvement of health, and prevention of childhood obesity in preschool children. Nutrition education should first aim to increase knowledge about nutrition and then change eating attitudes and behaviors. In this context, interventions should be planned and executed to expand the nutrition knowledge and improve eating attitudes and behaviors of preschool teachers.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Funda Elmacıoğlu, Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Design:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Control/Supervision:*** *Funda Elmacıoğlu, Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Data Collection and/or Processing:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Analysis and/or Interpretation:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Literature Review:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Writing the Article:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Critical Review:*** *Elif Emiroğlu, Mutlu Tuçe Ülker;* ***References and Fundings:*** *Funda Elmacıoğlu, Elif Emiroğlu, Mutlu Tuçe Ülker;* ***Materials:*** *Elif Emiroğlu, Mutlu Tuçe Ülker.*

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