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Assessment of Weight Management Nutrition Knowledge Level Among Individuals Applying to a Diet Center

Diyet Merkezine Başvuran Bireylerde Ağırlık Yönetimi Beslenme Bilgi Düzeyinin Değerlendirilmesi

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Abstract

Objective: This study aimed to assess the level of nutritional weight management knowledge among individuals applying to a private nutrition and diet counseling center for weight management.

Materials and Methods: Data were collected between January and May 2025 using voluntary face-to-face survey interviews. The sample size was determined to be at least 176 individuals based on a G*Power analysis for two independent groups with a 95% confidence level and a 5% margin of error; a total of 180 individuals were included in the study, comprising 90 new and 90 established patients. The socio-demographic characteristics of the participants were given in the first part, and the second part included the Weight Management Nutrition Knowledge Questionnaire (WMNKQ).

Results: The mean BMI was 29.08±11.59 kg/m², and the WMNKQ score was 25.31±5.21. The results revealed a significant difference in clinical variables, including diet follow-up duration (p=0.001), presence of diagnosed disease (p=0.001), and disease-specific diet application status (p=0.025). Individuals with postgraduate education had statistically significantly higher WMNKQ scores than those with a high school or associate degree ($p < 0.05$). Positive and statistically significant relationships were found between WMNKQ scores and BMI (r=0.232, p=0.002) and duration of diet continuation (r=0.268, p=0.011).

Conclusion: The level of knowledge regarding weight management is closely related to individuals' clinical characteristics, the duration of nutritional follow-up, and education level. These findings highlight the need to examine different clinical groups and educational interventions and may contribute to the development of more effective weight management programs.

Keywords: BMI, nutrition education, obesity, weight management nutrition knowledge

Öz

Amaç: Bu çalışmada özel bir beslenme ve diyet danışmanlık merkezine başvuran bireylerin ağırlık yönetimine ilişkin beslenme bilgi düzeylerinin değerlendirilmesi amaçlanmıştır.

Materyal ve Metot: Çalışma verileri Ocak-Mayıs 2025 tarihleri arasında yüz yüze anket yoluyla gönüllülük esasına göre toplanmıştır. Örneklem büyüklüğü G*Power analiz yöntemi kullanılarak hesaplanmış; %95 güven düzeyi ve iki bağımsız grup için %5 hata payı baz alınarak en az 176 bireyin çalışmaya dâhil edilmesi beklenmiştir. Çalışmaya 90 yeni hasta ve 90 mevcut hasta olmak üzere toplam 180 birey katılmıştır. Katılımcıların sosyo-demografik özellikleri birinci bölümde verilmiş, ikinci bölümde Ağırlık Yönetimi Beslenme Bilgi Anketi (AYBBÖ) yer almıştır.

Bulgular: Ortalama BKI 29,08±11,59 kg/m², AYBBÖ puanı ise 25,31±5,21 olarak bulunmuştur. Bireylerin ABBYÖ puanları analiz edilmiş ve sonuçlar klinik değişkenler olan diyet takip süresi (p=0,001), tanılı hastalık varlığı (p=0,001) ve hastalığa özgü diyet uygulama durumu (p=0,025) açısından anlamlı bir fark ortaya koymuştur. Lisansüstü eğitim düzeyine sahip bireylerin AYBBÖ puanları, lise ve ön lisans mezunu olan bireylere göre istatistiksel olarak anlamlı derecede yüksektir (p<0,05). Korelasyon analizleri sonucunda AYBBÖ puanları ile BKİ (r=0,232, p=0,002) ve diyete devam etme süresi (r=0,268, p=0,011) arasında pozitif ve istatistiksel olarak anlamlı ilişkiler bulunmuştur.

Sonuç: Sonuç olarak ağırlık yönetimine ilişkin bilgi düzeyinin, bireylerin klinik özellikleri, beslenme takip süresi ve eğitim düzeyi ile yakından ilişkili olduğu görülmektedir. Bu bulgular, farklı klinik gruplar ve eğitim müdahalelerinin incelenmesi gerekliliğini ortaya koymakta ve daha etkili kilo yönetimi programlarının geliştirilmesine katkı sağlayabilir.

Anahtar Kelimeler: Ağırlık yönetimi beslenme bilgi düzeyi, beden kütle indeksi, beslenme eğitimi, obezite

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INTRODUCTION

The World Health Organization (WHO) defines obesity as the accumulation of excessive fat tissue in the body, which increases the risk of developing metabolic disorders such as non-alcoholic fatty liver disease, insulin resistance, and cardiovascular diseases. According to WHO data, 39% of adults worldwide are overweight or obese, and excess body weight is a major risk factor for noncommunicable diseases.[1,2] Based on the Türkiye Health Survey, 21.1% of the population in Türkiye is classified as obese. When evaluated by gender, 24.8% of women are classified as obese and 30.4% as borderline obese. Among men, 17.3% are obese, and 39.7% are borderline obese.[3] Globally, the prevalence of obesity is reported as 36.9% in adult men and 38% in women.[4] Changing dietary patterns, decreased physical activity levels, environmental factors, and individual lifestyle choices all contribute to the development of obesity.[5] Obesity treatment includes lifestyle modifications, pharmacological therapies, and surgical interventions, with lifestyle-based programs focusing on dietary changes, physical activity, and behavioral strategies to support weight control.[6,7] Portion control plays a critical role in combating obesity, particularly given the positive association between increasing portion sizes and energy intake.[8,9] Research indicates that reducing portion sizes can lead to lower energy intake and contribute to maintaining a healthy body weight.[10] Individuals with a high level of eating awareness have been found to consume smaller portions, and they are more careful about high-energy foods.[11] This suggests that nutrition knowledge and awareness facilitate weight management by promoting healthier food choices, and that energy-restricted diets are recommended as a primary approach in managing obesity.[12] Therefore, disseminating nutrition education at public level and raising awareness should be among the priority goals of obesity prevention strategies.[13]

Understanding nutritional principles does not guarantee behavioral changes that lead to successful long-term weight loss. This study aimed to assess the nutritional knowledge levels of individuals attending a specialized nutrition and diet center regarding weight management.

MATERIALS AND METHODS

Ethical Considerations: This research received ethics committee approval from the Afyonkarahisar Health Sciences University Non-Interventional Scientific Research Ethics Committee (Date: 3.01.2025, decision no: 2025/13). Participants who volunteered to participate in the research were informed about noting down the details (purpose, procedure, data use) and provided informed consent. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Research Design and Sampling: The study data were collected through face-to-face surveys with volunteers attending the Private Nutrition and Diet Center between January and May 2025. The study was designed as a cross-sectional study, and convenience sampling was employed because high participation rates were targeted. The inclusion criteria of the study were defined as having no prior academic training in nutrition, not having previously received nutrition education or counseling from any diet center, participating voluntarily, and being between 18 and 64 years of age. Exclusion criteria included not volunteering, being under 18, or being 65 or older. The required sample size was calculated using the G*Power (3.1.9.7) analysis method.[14] Based on a 95% confidence level and a 5% acceptable margin of error for two independent groups, a minimum of 176 participants were planned for inclusion. A total of 180 individuals were included in the study: 90 new patients and 90 established patients. A ‘new patient’ refers to an individual who applies to the diet center for the first time and receives dietary counseling for the first time, whereas an ‘established (old) patient’ refers to individuals who are regularly followed by the dietitian and have attended at least four or more counseling sessions.

Data Collection: The survey form used in the study consisted of two parts. The first part of the 12-question survey addressed the individuals' sociodemographic characteristics, including age, gender, education, and income status, as well as their diagnosed disease status, participation in medical nutrition therapy, and duration of visits to a dietitian. The second part consisted of the Weight Management Nutrition Knowledge Questionnaire, which has been validated for use in Turkish. Before participating in the study, individuals were informed about its purpose, scope, and procedures, and they provided informed consent.

Weight Management Nutrition Knowledge Questionnaire (WMNKQ): A validity and reliability study of the WMNKQ, developed by Mikhail et al.,[15] conducted by Onbaşı and Akçil Ok[16] for its adaptation into Turkish. The scale covers important nutritional knowledge areas for weight management, such as the energy density of foods, the effect of portion size and portion control on nutritional intake, the consumption of alcoholic and sugar-sweetened beverages, the effects of access to different foods on consumption, and reliable sources of nutritional information. This scale, consisting of 43 items, is scored out of 1 for each correct answer. The lowest possible

score is 0, and the highest is 43. Because there is no cut-off point on the scale, the participants' total average score is considered the cut-off point. Higher scores indicate a high level of nutritional knowledge regarding weight management.[17] The original Cronbach's alpha value of the scale was reported as 0.88,[15] and the value in the adaptation study was 0.75.[17] In the study, the scale demonstrated a high level of reliability, with a Cronbach's alpha of 0.84.

Statistical Analysis: The data in this study were analyzed using the IBM SPSS Statistics software package (Version 22). Since normality is a fundamental assumption for selecting appropriate statistical methods, the data distribution was assessed prior to conducting inferential analyses. To determine whether the scores of WMNKQ were normally distributed, both the Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted. Additionally, Skewness and Kurtosis values were examined to support the evaluation of distribution. As the continuous variables demonstrated normal distribution, descriptive statistics, including the mean, standard deviation, minimum, and maximum values, were used to summarize these variables. For categorical variables, frequencies (n) and percentages (%) were reported. Independent samples t-tests and one-way ANOVA were used to examine group differences. The relationships between continuous variables were assessed using correlation analyses. Pearson correlation coefficients were used for normally distributed variables, while Spearman's rank-order correlation was applied when the assumption of normality was not met. Correlation coefficients were interpreted as follows: <0.2 very weak, 0.2–0.4 weak, 0.4–0.6 moderate, 0.6–0.8 high, and >0.8 very high. All statistical analyses were interpreted using a significance level of $p < 0.05$.

RESULTS

A total of 180 individuals participated in the study. Most participants were female (87.2%; n = 157), while the proportion of male participants was 12.8% (n = 23). The mean age of the participants was 36.35 ± 9.08 years, with an age range of 18 to 64 years. The mean Body Mass Index (BMI) was determined as 29.08 ± 11.59, with a minimum value of 18.22 and a maximum value of 47.87. The majority of participants were married individuals, 77.2%, while the rate of singles was 22.2%. In terms of educational level, more than half of the participants held a bachelor's degree (50.6%), while the others had high school, associate's degrees, and postgraduate degrees. When the occupational distribution was examined, the largest group consisted of civil servants (40.6%) and freelancers (22.8%). Of the participants, 55.0% had a diagnosed disease, and 53.3% reported following a disease-specific diet. Because WMNKQ has no defined cutoff point, the total score obtained from the scale was evaluated based on the mean value. In this study, the mean total score obtained from the 180 participants on the scale was 25.31 ± 5.21 (Table 1).

Table 1. Socio-demographic characteristics of the participants.

Variable		**Data**
Gender, n (%)	Female	157 (87.2)
	Male	23 (12.8)
Age (year), Mean±SD		36.35 ± 9.08
BMI Group, n (%)	Underweight	2 (1.1)
	Normal	47 (26.1)
	Pre-obese	61 (33.9)
	Obese	70 (38.9)
BMI (kg/m^2), Mean±SD		29.08 ± 11.59
Marital status, n (%)	Single/Divorced/Widowed	41 (22.8)
	Married	139 (77.2)
Education Level, n (%)	Illiterate / Primary school	3 (1.7)
	Secondary education	5 (2.8)
	High school	33 (18.3)
	Associate degree	23 (12.8)
	Bachelor's degree	91 (50.6)
	Postgraduate (Master's/PhD) degree	25 (13.8)

WMNKQ: Weight Management Nutrition Knowledge Questionnaire; BMI: Body Mass Index.

Continuation of **Table 1**

Variable		**Data**
Occupation, n (%)	Housewife	34 (18.9)
	Self-employed	41 (22.8)
	Civil Servant	73 (40.6)
	Worker	11 (6.1)
	Retired	2 (1.1)
	Student	10 (5.6)
	Unemployed	8 (4.4)
	Other	1 (0.5)
Duration of Follow-Up with a Dietitian, n (%)	New Patient	90 (50.0)
	Old Patient	90 (50.0)
Diagnosed Disease Status, n (%)	Yes	99 (55.0)
	No	81 (45.0)
Disease-Specific Diet Situation, n (%)	Yes	96 (53.3)
	No	84 (46.7)
WMNKQ Mean Score, Mean±SD		25.31 ± 5.21

WMNKQ: Weight Management Nutrition Knowledge Questionnaire; BMI: Body Mass Index.

When the distribution of mean scores on the WMNKQ is examined in Table 2, it is seen that 52.8% (n=95) of the participants had low nutritional knowledge (<25.31). In comparison, 47.2% (n=85) had high nutritional knowledge (>25.31).

Table 2. Mean WMNKQ scores of the participants.

		Data
WMNKQ Mean Score, n (%)	Low (<25.31)	95 (52.8)
	High (>25.31)	85 (47.2)

WMNKQ: Weight Management Nutrition Knowledge Questionnaire.

When the mean WMNKQ scores of the participants were compared by gender, no statistically significant difference was observed between the groups (p = 0.053). Although the mean score of male participants was higher than that of female participants, this difference did not reach statistical significance (p>0.05). In terms of marital status, a statistically significant difference was found between the groups (p = 0.027). Participants who were single, widowed, or divorced had lower WMNKQ mean scores compared to those who were married. A statistically significant difference was observed according to diet monitoring status (p = 0.001). The mean scores of former patients were significantly higher than those of new patients. When the participants were compared according to whether they had a diagnosed disease, a statistically significant difference was found between the groups (p = 0.001). The mean scores of individuals with a diagnosed disease were higher than those without any diagnosed condition. Finally, in the comparison based on whether participants followed a disease-specific diet, a statistically significant difference was found (p = 0.025). Participants who reported following a disease-specific diet had higher WMNKQ scores than those who did not (Table 3).

Table 3. Comparison of WMNKQ mean scores by demographic characteristics.

Demographic Characters		**WMNKQ Mean Score**	
		Mean±SD	**p-value**
Gender	Female	25.0 ± 5.09	0.053
	Male	27.2 ± 5.62	
Marital status	Single/Divorced/Widowed	24.8 ± 5.09	**0.027**
	Married	26.8 ± 5.33	
Duration of Follow-Up with a Dietitian	New Patient	24.0 ± 5.48	**0.001**
	Old Patient	26.5 ± 4.60	
Diagnosed Disease Status	Yes	26.7 ± 5.20	**0.001**
	No	24.1 ± 4.91	
Disease-Specific Diet Situation	Yes	27.3 ± 4.64	**0.025**
	No	24.1 ± 6.62	

WMNKQ: Weight Management Nutrition Knowledge Questionnaire; *: p-value was obtained by Independent Samples t-test; *: p<0.05.

In this context, although a negative correlation was observed between age and WMNKQ scores, the relationship was not statistically significant (r = –0.096, p = 0.200). In contrast, a statistically significant positive correlation was found between BMI and WMNKQ scores (r = 0.232, p = 0.002). Similarly, an essential and positive correlation was observed between the duration of diet follow-up and WMNKQ scores (r = 0.268, p = 0.011). These findings suggest that as individuals' BMI and duration of dietary adherence increase, their knowledge and skills related to weight management also improve (Table 4).

Table 4. Correlation between participants' demographic variables and WMNKQ mean scores.

Demographic Variables	WMNKQ Mean Score	
	r	p
Age (year)	-0.096	0.200*
BMI	0.232	**0.002****
Duration of Follow-Up with a Dietitian	0.268	**0.011****

WMNKQ: Weight Management Nutrition Knowledge Questionnaire; BMI: Body Mass Index; *: p-value was obtained by *Pearson Correlation test*; **: p-value was obtained by *Spearman's RHO*; *: p<0.05.

In Table 5, the categories "illiterate" and "primary school graduate" were combined to ensure an adequate sample size per group. This combination was made considering the statistical prerequisite that each group must include at least two participants. The analysis revealed a statistically significant difference in WMNKQ mean scores across different education levels. According to the post hoc analysis (Tukey test), participants with postgraduate education had significantly higher WMNKQ mean scores compared to those with high school and associate degrees.

Table 5. WMNKQ mean scores by the education level of the participants.

Scores	Education Level	Mean±SD	F	p
WMNKQ Mean Score	Illiterate / Primary school	21.6 ± 11.06	3.989	**0.002***
	Secondary education	20.2 ± 6.53		
	High school^{+}	23.0 ± 4.90		
	Associate degree^{+}	26.3 ± 4.55		
	Bachelor's degree	25.6 ± 5.11		
	Postgraduate (Master's/PhD) degree^{+}	27.6 ± 3.84		

WMNKQ: Weight Management Nutrition Knowledge Questionnaire; *: p-value was obtained by One-Way ANOVA; $^{+}$: Indicates groups between which Tukey post-hoc analysis showed statistically significant differences.

DISCUSSION AND CONCLUSION

In a study conducted by Mikhail et al., who developed the WMNKQ, the average score of the participants (n=171) on the scale was 24.5 ± 6.2, indicating that the individuals generally had a moderate level of knowledge.[15] Similarly, the average score obtained in this study (n=180) was 25.31 ± 5.21, which is highly consistent with the findings in the development study. In the survey conducted by Onbaşı, the average score of the participants (n=25) on the WMNKQ before the training was 23.6 ± 4.95.[17] Based on the Türkiye Nutrition Guide 2015, it was reported that after the training given in at least 30-minute sessions every ten days for four months, this average score increased to 35.6 ± 4.06, and this increase was statistically significant (p<0.05). In the study, the mean score on the WMNKQ was found to be 24.08 ± 5.49 for new clients, while the mean score for experienced clients was significantly higher (p = 0.001) at 26.53 ± 4.62.

The study's findings revealed that participants' weight management nutrition knowledge varied significantly depending on variables such as education level and the duration of their visit to a dietitian. Knowledge scores were found to increase statistically significantly as education level increased; the highest scores were observed in postgraduate graduates, and the lowest scores were observed in primary school graduates. The higher nutritional knowledge levels of individuals who began dietitian support earlier indicate that knowledge is strengthened over time through experience. These findings are consistent with the study conducted by Mitchell et al.,[18] which demonstrated that nutritional knowledge levels are significantly associated with long-term weight loss. At an eighteen-month follow-up, individuals reporting greater weight loss were found to have higher knowledge levels on topics such as energy density, portion control, and food variety. A possible explanation for the positive correlation between BMI and knowledge level observed in this study is that individuals with higher BMI may seek dietitian support more frequently and for longer periods, resulting in greater exposure to nutrition education and knowledge accumulation. Additionally, this finding may reflect the well-documented 'knowledge–behavior gap',

in which individuals possess adequate nutritional knowledge but struggle to translate it into sustained behavioral change.

Valmórbida et al., in a cross-sectional study with 263 individuals, reported a statistically significant negative correlation between nutritional knowledge and BMI, waist circumference, and waist-to-hip ratio.[19] Another cross-sectional study by Amenya et al., involving 591 school-aged children aged 8-13 years, revealed that BMI for age was positively correlated with nutritional knowledge and total nutrition and physical activity knowledge.[20] Almasi and Rakıcıoğlu conducted a cross-sectional study with 300 university students aged 18-35 to determine the level of nutrition knowledge among university students and to examine the relationship between nutrition knowledge and dietary intake. They found that students with higher nutritional knowledge had lower daily energy intake compared to those with lower nutritional knowledge.[21]

In some intervention studies with a nutrition component, significant weight loss was observed in the intervention groups after strategies aimed at increasing knowledge (e.g., one-on-one counseling, group education) were implemented. For example, in the study conducted by Martin et al., 26% of individuals who received group-based lifestyle education lost more than 7% of their initial weight, while this rate was only 10% in the control group ($p = 0.002$).[22] Similarly, in the study conducted by Wadden et al., an average of 4.6 kg was lost in the group receiving intensive counseling.[23] Appel et al. observed a weight loss of 5.1 kg in the individual counseling group, and these differences were found to be statistically significant ($p<0.001$).[24] These findings suggest that knowledge level may indirectly impact health behaviors.

These findings suggest that individuals' adequate and accurate nutritional knowledge during the weight management process, particularly their knowledge of energy density, portion size, and food variety, can be a determining factor in long-term weight control. Therefore, intervention strategies aimed at increasing nutritional knowledge should be considered a key component of achieving lasting and sustainable weight management goals.

This study has several limitations. The predominance of female participants limits the generalizability of sex-based comparisons. Given that women are more likely to seek dietary counseling and may differ from men in terms of nutrition knowledge, health motivation, and engagement in weight management practices, the findings may not fully reflect the experiences or knowledge levels of male participants. In addition, the cross-sectional design precludes causal inferences, and the use of convenience sampling and self-reported data may have introduced sampling and social desirability bias. Conducting the study in a single private diet center further limits generalizability, and the translation of knowledge levels into long-term dietary behaviors and weight management outcomes was not evaluated.

In conclusion, this study demonstrates that nutrition knowledge related to weight management varies significantly according to educational background, duration of dietary adherence, and timing of initial engagement in weight management programs. Higher knowledge scores were observed among individuals with postgraduate education and longer exposure to professional support. These findings suggest that nutrition knowledge is shaped not only by educational content but also by accumulated experience and ongoing interaction with health professionals, highlighting the importance of integrating structured and personalized education early in dietary interventions, particularly for individuals with lower educational levels or those new to treatment. Future research should examine how the timing, intensity, and format of nutrition counseling influence both knowledge acquisition and sustainable behavior change.

Ethics Committee Approval: The study was approved by the Afyonkarahisar Health Sciences University Non-Interventional Scientific Research Ethics Committee (Date: 3.01.2025, decision no: 2025/13). The study was conducted in accordance with international declarations, guidelines, and other relevant standards.

Conflict of Interest: No conflict of interest was declared by the authors.

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