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Dietary satisfaction and quality of life in individuals following diet programs satisfaction of diet programs

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Abstract

Purpose – The purpose of this study was to assess individuals' satisfaction with their diet programs and evaluate the impact of their diet on their quality of life (QOL).

Design/methodology/approach – This cross-sectional study was conducted with 812 females and 334 males (n = 1,046) aged 18–65 years, all of whom were following a diet program under the guidance of a dietitian. The questionnaire included personal information as well as items related to dietary satisfaction and QOL, measured using the SF-36 scale.

Findings – Of the participants, 38.4% were aged 18–24, and 32.6% were aged 25–40. The mean score for dietary satisfaction was 3.0 ± 0.9 (out of 5), while the mean scores for the mental and physical components of the QOL scale were 62.0 ± 17.8 and 74.3 ± 19.2, respectively. Factors such as age, BMI and duration of the diet were associated with dietary satisfaction, whereas age, gender, health status, diet type and BMI impacted QOL ($p < 0.05$). Dietary satisfaction scores showed a weak positive correlation with QOL scores ($r = 0.125$; $p < 0.01$).

Originality/value – Dietary satisfaction and QOL are influenced by demographic characteristics, health status, diet type and the duration of the diet program. Additionally, there is a correlation between dietary satisfaction and QOL. To ensure the sustainability and suitability of long-term dietary plans, it is crucial to monitor patients' dietary satisfaction. In this context, assessing the QOL in individuals on diet programs, using a newly validated diet satisfaction scale, adds originality and value to the study.

Keywords Body weight, Quality of life, Personal satisfaction

Paper type Research paper

Introduction

Healthy lifestyle practices are among the important factors that prolong the life span of individuals and with the increase in life expectancy, maintaining the healthy status and quality of lifestyle has gained significance (Vanleerberghe *et al.*, 2017). Healthy nutrition and maintenance of weight are important criteria for the protection of the health status in individuals

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(Kolotkin *et al.*, 2001). The success of diet programs applied for weight management and disease state depends on its easy adaptability and sustainability, which in turn is again determined by the satisfaction of the patient with his diet. Although specific dietary meal plans are prepared according to the needs and preferences of each individual, there may be changes in terms of expectations and satisfaction on behalf of the patients, as the duration of the dietary plan (program) prolongs. In order for dietitians to evaluate the dietary satisfaction of patients with the diet programs, a set of questions should be addressed to the patients which would enable them to understand them better, and make the necessary changes in the diet for greater satisfaction and compliance (Eskici and Yilmaz, 2021).

Quality of life (QOL) for individuals, is affected by factors such as income, education, housing, social status. Health of the individual has an important place among these factors. Health-related QOL is a measure that covers the physical, psychological and social aspects of health and shows where the individual puts his/her life in terms of health-related expectations, standards and concerns (Testa and Simonson, 1996). This measure has been used in many studies to improve health or treatment of diseases in individuals (Rubin and Peyrot, 1999; Chirico *et al.*, 2017). In this context, obesity and being overweight has been found to have an inverse relationship with QOL due to the increased prevalence in chronic diseases (Kolotkin and Andersen, 2017). Therefore, success of a diet program may be expected to have a positive impact on QOL. However, a few studies have been conducted on dietary satisfaction of individuals, success of diet programs and effects on QOL. As the satisfaction levels of individuals with implemented diet program increase, they are more likely to adhere to the dietary plan, achieve a healthy weight and improve QOL. This study identified the key challenges in sustaining patients' diets by evaluating the QOL while following the program and also assessing their satisfaction level, using a newly validated scale. The validated dietary satisfaction scale has not been used yet in Turkish patients, to identify the QOL, while enrolled in the program. Therefore, this study has been aimed to address the above and it is believed that, understanding patients from this perspective will not only support the weight loss process but also increase the success rate of long-term weight maintenance programs.

The aim of this study was to determine the dietary satisfaction of a group of adult individuals with their diets programs and to examine the relationship with their QOL.

Material and methods

The study was conducted on 812 female and 334 male (n = 1,046) individuals between the ages of 18–65 who applied to the nutrition and diet polyclinics of Istanbul Medipol University Hospitals in Istanbul, Turkey between January and April 2022. The criteria for inclusion in the research were as follows; (i) to be aged between 18 and 65 years, (ii) undergone or enrolled in a diet program under the consultancy of a dietician and (iii) having no perception disorders (such as Dementia, Alzheimer's disease) or communication problems.

Ethical approval for the study was obtained from the Istanbul Medipol University ethics committee (dated 08.02.2022, numbered E-10840098-772–02-909) and all participants gave written informed consent. As the voluntariness was taken as a basis for participation, all the participants signed the volunteer consent form. This study was conducted in accordance with the principles of the Declaration of Helsinki.

Descriptive characteristics of participants

The descriptive characteristics of the participants were determined by means of a questionnaire. Gender, age, presence of diseases (diagnosed by a physician), type and duration of diet were interrogated. BMI (kg/m^2) was calculated from the weight and height stated by them. BMI of

participants was evaluated according to World Health Organization, 2022 (WHO) classification criteria. BMI of <18.5 was considered underweight, between 18.5 and 24.9 were considered normal weight, between 25.0 and 29.9 were considered pre-obesity, BMI of 30 and above was considered obese (class I, II and III). The implemented diet programs by participants included ones for losing weight, for diseases and short-term specific dietary plans based on personal choice. Diet programs were formed by individually and weekly.

Dietary satisfaction scale

The Diet Satisfaction Scale was developed in 2019 by Jospe *et al.* (2020). Validity and reliability studies of the scale in Turkey were conducted by Eskici and Karahan Yılmaz, 2021. The validated scale comprising of nine items, to be scored between 1 and 5. The highest score for each item being 5, maximum score that could be obtained from all items is 45. There was no reverse scoring for any item in the scale. Higher the score, the higher was the satisfaction with the diet. For each item, a score higher than 3.0 (or 27.0 in total) indicated individual's satisfaction for the diet was more than average. The factor loads of the items varied between 0.505 and 0.894 and the item total correlations varied between 0.422 and 0.847. The Cronbach's alpha coefficient of the nine-item scale was found to be 0.902. The Diet Satisfaction Scale was chosen for strong validity and reliability in Turkish (Cronbach's alpha reliability coefficient = 0.902). The authors performing the validation study have recommended the scale to be suitable for use in the assessment of dietary satisfaction of Turkish individuals aged 18–65 who followed diet programs for various reasons (Eskici and Yilmaz, 2021).

Quality of life short form (SF36) scale

QOL short form-36 (SF-36), a self-assessment scale examining 8 domains (components) of health having 36 items in total was developed by Rand Corporation in 1992 (Ware and Sherbourne, 1992) and its Turkish validity and reliability studies were conducted by Kocyigit *et al.*, 1999. The scale was evaluated under physical component score (PCS) and mental component score (MCS). The subcomponents included in SF-36 that defined PCS were physical functioning, physical role limitations, general health perceptions, and bodily pain and the sub-components that defined MCS were mental health, vitality, social functioning and emotional role limitations. Each sub-component was scored ranging from 0 to 100 based on the responses for items listed under each sub-component. The SF36 Scale was chosen for its proven validity and reliability in Turkish (Cronbach's alpha reliability coefficient = 0.761), as well as its ease of use in clinical settings. It has been widely used in many studies in the literature and have been reported to be suitable for Turkish adults in diseases and non-diseased conditions (Kocyigit *et al.*, 1999).

Analysis of data

The data obtained was analyzed using SPSS Statistical software version 26. Independent Sample T-test was used to compare the normally distributed paired groups, and one-way ANOVA was used for comparison of multiple groups. Mann Whitney *U* test was used to compare paired groups that did not show normal distribution, and Kruskal Wallis H Test was used to compare multiple groups that were not normally distributed. *Post hoc* tests were used to analyze the differences between the groups. Pearson and Spearman's tests were used for correlation analysis. The relationship between dietary satisfaction score of participants (independent variable) and their QOL scores were analyzed by simple linear regression analysis. The level of significance for all data obtained was accepted at 0.05 value ($p < 0.05$) (Tabachnick and Fidell, 2013; George and Mallery, 2003).

Results

Descriptive characteristics of participants

Of the 1146 participants, 70.9% were females and 38.4% were between the ages of 18–24, 32.6% were between 25 and 40 years. Based on the WHO BMI classification, 5.1% were found to be underweight, 48.0% were normal, 30.5% were preobese and 16.5% were obese. When enquired about diseased status, 31.2% of the participants stated to have been diagnosed with at least one disease, by a physician. Cardiovascular, endocrine and diabetes were among the main diseases diagnosed. Regarding participation in diet programs, 82.6% of the participants stated to have undergone diet for weight maintenance, 7.9% for a specific disease and 9.5% for a short-term diet based on personal choice. As per duration of diet undergone by the participants, 32.1% of the participants followed a diet program for a month or less, 16.7% between 1 and 3 months, 21.4% between 3 and 6 months, 9.9% between 7 and 9 months, 2.2% between 10 and 12 months and 16.5% for more than 12 months (Table 1).

Scores for diet satisfaction and QOL scales

According to the data obtained from 1146 participants, the mean score of diet satisfaction scale was found to be 3.0 ± 0.9 and the mean QOL score was 69.2 ± 16.3. The mean MCS was 62.0 ± 17.8 and the mean PCS was 74.3 ± 19.2. Age was found to have an effect on diet satisfaction and QOL scores. Individuals between the ages of 41–65 had significantly higher dietary satisfaction scores (3.1 ± 0.9) ($p < 0.001$) and lower QOL scores (66.7 ± 18.3) as compared to individuals in other age groups ($p = 0.048$). Gender did not have an effect on diet satisfaction ($p = 0.879$); however, the QOL score was significantly higher in males (70.9 ± 16.3) than females (68.5 ± 16.3) ($p = 0.022$). While the presence of chronic diseases did not affect diet satisfaction, it had an impact on QOL. The QOL scores of individuals with

Table 1. Descriptive characteristics of participants

Characteristic	Category	*n* (1,146)	%
Age (years)	18–24	440	38,4
	25–40	373	32,6
	41–65	332	29,0
Gender	Female	812	70.9
	Male	334	20.1
Any diagnosed disease by physician	Present	357	31.2
	Absent	789	68.8
Type of diet	Weight management	947	82.6
	Disease-specific	90	7.9
	Personal choice	109	9.5
Duration of diet (months)	<1	368	32.1
	1–3	192	16.7
	4–6	245	21.4
	7–9	113	9.9
	10–12	25	2.2
	>12	203	17.7
BMI (kg/m^2)	<18.5	58	5.1
	18.5–24.9	550	48.0
	25.0–29.9	349	30.5
	30 or more	189	16.5

Source: Authors' own work

(at least one diagnosed) disease (65.5 ± 16.8) were significantly lower than those without the disease (70.9 ± 15.8). The diet types of the participants did not affect the diet satisfaction score, but the QOL scores (69.9 ± 16.5) of those who followed the weight management diet were found to be significantly higher than the other participants. The duration of diet affected the diet satisfaction score, but not the QOL score. Diet satisfaction scale scores of users who have been on a diet for 12 months or longer were significantly lower than those who had been on a diet for a less than a month. Therefore, the increase in diet duration decreased the diet satisfaction scores ($p = 0.016$). BMI values of individuals affected diet satisfaction score and QOL scores. Diet satisfaction was significantly higher ($p = 0.016$) but QOL lower in higher BMI groups as compared to underweight and normal BMI groups ($p = 0.001$) (Table 2).

A weak correlation was found between diet satisfaction scores with QOL total ($R = 0.125$), PCS ($R = 0.127$) and MCS ($R = 0.095$) component scores. On the other hand, a strong positive correlation was found between the QOL total score and PCS ($R = 0.935$) and MCS ($R = 0.835$) ($p < 0.001$) component scores of the QOL scale. In addition, a moderate positive correlation was also found between PCS and MCS component values ($R = 0.587$) ($p < 0.001$) (Table 3).

Table 2. Diet satisfaction and quality of life scores according to descriptive characteristics of participants

Characteristic	Diet satisfaction score			Quality of life score		
Age (years)	$\bar{X}$ ± SD	F ve χ^2	*p*	$\bar{X}$ ± SD	F ve χ^2	*p*
18–24	2.9 ± 0.8	1.886	*0.000*	71.3 ± 14.3	1.379	*0.048*
25–40	3.0 ± 0.9			69.0 ± 16.3		
41–65	3.1 ± 0.9			66.7 ± 18.3		
Gender	$\bar{X}$ ± SD	*t* veya U	*p*	$\bar{X}$ ± SD	*t* veya U	*p*
Female	3.0 ± 0.9	–0.152	0.879	68.5 ± 16.3	2.295	*0.022*
Male	3.0 ± 0.8			70.9 ± 16.3		
Diagnosed disease	$\bar{X}$ ± SD	*t* veya U	*p*	$\bar{X}$ ± SD	*t* veya U	*p*
Present	3.0 ± 0.9	1.489	0.137	65.5 ± 16.8	–5.258	*0.000*
Absent	3.0 ± 0.8			70.9 ± 15.8		
Type of diet	$\bar{X}$ ± SD	F ve χ^2	*p*	$\bar{X}$ ± SD	F ve χ^2	*p*
Weight management	3.0 ± 0.9	1.956	0.142	69.9 ± 16.5	5.822	*0.003*
Disease-specific	3.1 ± 0.7			66.4 ± 16.8		
Personal choice	3.1 ± 1.0			65.1 ± 17.3		
Duration of diet (months)	$\bar{X}$ ± SD	F ve χ^2	*p*	$\bar{X}$ ± SD	F ve χ^2	*p*
<1	3.1 ± 0.8	2.787	*0.016*	69.4 ± 15.7	0.941	0.453
1–3	3.0 ± 0.9			69.3 ± 15.9		
3–6	3.0 ± 0.8			68.8 ± 17.0		
6–9	3.0 ± 0.9			69.2 ± 16.9		
9–12	3.0 ± 0.8			75.7 ± 13.6		
>12	2.8 ± 0.9			68.4 ± 16.9		
BMI category (kg/m^2)	$\bar{X}$ ± SD	F ve χ^2	*p*	$\bar{X}$ ± SD	F ve χ^2	*p*
<18.5	2.7 ± 0.7	3.454	*0.016*	70.0 ± 15.9	5.513	*0.001*
18.5–24.9	3.0 ± 0.9			70.6 ± 16.1		
25–29.9	3.0 ± 0.8			69.1 ± 16.4		
30 or more	3.1 ± 0.9			65.1 ± 16.5		

Notes: *$p < 0,05$; **$p < 0,01$; F = one-way ANOVA Testi; χ^2 = Kruskal–Wallis H Testi; t = independent sample T or Mann–Whitney U test
Source: Authors' own work

Table 3. Correlation between scores obtained from participants

Scores	1	2	3	4
1. Dietary satisfaction				
r	1			
p				
2. Quality of life (total)				
r	0.125**	1		
p	0.000			
3. Quality of life – MCS				
r	0.095**	0.835**	1	
p	0.001	0.000		
4. Quality of life – PCS				
r	0.127**	0.935**	0.587**	1
p	0.000	0.000	0.000	

Notes: **Correlation at 0.01 (two-tailed); *Correlation at 0.05 (two-tailed); r = correlation co-efficient
Source: Authors' own work

A simple regression analysis was performed to analyze the effect of dietary satisfaction on QOL (Table 4). The relationship between the two variables was found to be linear but weak. In the regression analysis of this model, the model was found to be statistically significant F (1.143) =18.10, $p < 0.01$). However, R^2 (the coefficient of determination) value was found to be 0.016 indicating the proportion of variance in QOL that could be explained by dietary satisfaction was moderately low ($R^2 = 0.016$).

Discussion

This study was conducted to determine the dietary satisfaction of adult individuals with the diet programs they underwent and examine the relationship of dietary satisfaction with QOL. Out of the 1146 participants, most (70.9%) were females and 47.0% were overweight and obese. Therefore the most popular diet programs undergone by the participants were the ones meant for maintenance of weight (82.6%). Although there is limited information regarding a reference for the diet satisfaction scale score in Turkey; however, the mean score of the individuals was found to be 3.0 ± 0.9 out of 5.0 which was considered above average. The mean MCS and PCS component scores of QOL were 62.0 ± 17.8 and 74.3 ± 19.2, respectively, which were found to be considerably higher than the results obtained in another reference study conducted in Turkey on 1271 individuals. The MCS and PCS component scores obtained were 47.7 ± 9.4 and 47.9 ± 8.9, respectively. It was suggested by the authors that characteristics of individuals and environmental factors affected quality of health scores

Table 4. Analysis of diet satisfaction and quality of life scales by simple regression analysis

Variable	*B*	SE_B	β (beta)	*T*	*p*
Dietary satisfaction	2.532	0.109		23.283	0.000
Quality of life	0.007	0.002	0.125	4.251	0.000
$R = 0.125$	$R^2 = 0.016$			F (1.143) = 18.10, $p < 0.01$	

Source: Authors' own work

and may not have standard reference values (Demiral *et al.*, 2006). In this study, gender was not found to be effective on diet satisfaction, but the QOL score was found to be higher in males (70.9 ± 16.3) than females (68.5 ± 16.3) (p = 0.879). There is limited knowledge regarding dietary satisfaction of individuals while undergoing such programs as well the effect on QOL. Kim and Joo, 2014 in their study stressed on the importance of data evaluating the effects of diet programs on QOL, not only from health perspectives but also in terms of research and development of new products in the food industry. The age of the participants was found to be effective on both diet satisfaction and QOL. Results of this study indicated that, while the diet satisfaction scores of the individuals aged 41–65 (3.1 ± 0.9) were higher than the individuals in the other age groups (p < 0.001), their QOL scores (66.7 ± 18.3) were lower (p = 0.048). As age increased, dietary satisfaction increased, but QOL score decreased. This result could be interpreted as the fact that chronic diseases and physical limitations are encountered more frequently with advancing age, reducing the QOL. However, positive results may be obtained from nutritional therapy (Puciato *et al.*, 2017). A study conducted on young adults reported a healthy dietary intervention for 3 weeks reduced depression, anxiety and stress and improving the QOL (Francis *et al.*, 2019). In this study, however, the QOL was not affected to a great extent by diet satisfaction (R = 0.125) probably because in general the QOL of this group was high.

In this study, it was determined that BMI values affected dietary satisfaction and QOL scores. As the BMI value increased (especially 30 and above), dietary satisfaction increased (p = 0.016), whereas the QOL score decreased (p = 0.001). QOL is expected to decrease with increased risk of obesity-related chronic diseases as cardiovascular diseases, some cancers, diabetes and musculoskeletal disorders (Ul-Haq *et al.*, 2013; Kortt and Dollery, 2011). Some studies reported depression and a decrease in QOL in obese individuals and with the reduction of weight, QOL scores was found to increase (Belmudes *et al.*, 2020; Martinelli *et al.*, 2021; Payne *et al.*, 2018). Similar was the situation in participants with diseased status, in this study. The QOL scores of participants with at least one diagnosed disease (65.5 ± 16.8) were found to be lower than those without any diseases (70.9 ± 15.8). Mood changes due to physical limitations caused by the disease were reported as one of the major cause of decrease in the QOL in individuals (Chirico *et al.*, 2017). However, a strong correlation was seen between the two component (MCS and PCS) scores and QOL total score (r = 0.587). The two components were also moderately related to each other. Mental and physical health in individuals have been shown to be strongly related to each other and also have a strong effect on QOL (Grassi *et al.*, 2020).

In this study, the correlation of total QOL, PCS and MCS component scores with dietary satisfaction scores was investigated. The correlation was found to be weak for total as well as PCS and MCS components of QOL. On analyzing the simple regression model although the model was found to be linear but due to the weak association (Total QOL R = 0.125, PCS R = 0.127, MCS R = 0.095) the regression value as expected was very low (R^2=0.016). It may be concluded that the proportion of variance in QOL that could be explained by dietary satisfaction was moderately low. In other words, in this study QOL of individuals was not affected to a significant degree by dietary satisfaction, it could have been affected by other parameters.

Nevertheless, in patients with negative health outcomes as obesity or other chronic diseases, improvement in QOL resulting from nutritional interventions can be seen as a factor that enhances long-term dietary adherence. Presenting these improvements to patients as clinical data would serve as an additional motivation for them to adhere to the program. A systematic review covering 116 studies indicated QOL and health-related QOL levels to have been improved significantly as a result of nutritional intervention (Pemau, *et al.*, 2024). In patients with chronic kidney diseases, low protein diet regime for six months indicated high satisfaction level and minimal dropouts (Piccoli *et al.*, 2020). However, studies

regarding QOL and dietary satisfaction in patients following weight loss diet programs are limited.

Apart from all the factors mentioned above, in this study, the dietary satisfaction of individuals who had undergone a dietary program for some reason was analyzed as a whole and its effects on QOL were also was evaluated objectively. As the BMI increased, an increase was observed in the dietary satisfaction scores of individuals aged 30 and over. This could be explained by the positive impact of the diet program on the individuals with respect BMI, improvements in health parameters and body image. Studies indicate improvements in biochemical parameters, physical-mental capacity and psychology of individuals after a certain period of time following the diet program (Yildiran and Mercanligil, 2019; Mohorko *et al.*, 2019). Therefore, attention should be directed toward individuals with high BMI or those requiring long-term dietary plans with a focus on developing new strategies to enhance their motivation.

Variable diet programs are applied to individuals from time to time as a part of healthy lifestyle. These programs may be aimed for maintenance of weight or treatment and management of diseases (Kim, 2021; Locke *et al.*, 2018). Although the dietary satisfaction score of individuals following a diet for weight gain/loss (weight management) was found to be lower as compared to the ones on other diets; in general, the correlation between the type of diet undergone by the participants and dietary satisfaction score was not found to be statistically significant ($p = 0.142$). QOL mean score (69.9 ± 16.5) was however significantly higher for individuals following the diet for weight management, as compared to the other two groups ($p = 0.03$). It may be concluded that diseases affected QOL negatively. On the other hand, as long as patients adhered to their diet programs, dietary satisfaction was not affected by the type of diet programs. The duration of the diet had no significant effect on either QOL or dietary satisfaction score. Nevertheless, diet satisfaction scores of individuals who were on a diet for 12 months or longer were lower than those who had been on a diet for one month or less. In other words, as the dieting period prolonged, dietary satisfaction decreased significantly ($p = 0.016$). Another study reported that the motivation of individuals and compliance with the dietary program decreased with prolongation of dietary period (James *et al.*, 2018). Brinkworth et al, in their study conducted on 106 overweight and obese individuals, suggested that the emotional state of individuals were negatively affected on application of a low-carbohydrate diet for a long time (Brinkworth *et al.*, 2009). On the other hand, it has also been reported that individuals who were satisfied with the positive results following a diet program e.g. a significant weight loss as a result of a weight loss diet program, tended to continue and comply with the program (Finch *et al.*, 2005; Foster *et al.*, 2004). It is concluded that individuals experience significantly higher satisfaction during periods of acute, rapid improvement in health outcomes and their distress levels diminish quickly. However, as the program extends and improvements tend to normalize, satisfaction levels start decreasing. In this context, dietitians should regularly assess patients' satisfaction and expectations throughout the diet program to maintain long-term adherence and achieve positive results. Additionally, patients should be informed that the process, of improvement in health outcomes, is gradual and that their expectations may diminish over time.

Conclusion

In addition to individual differences, dietary satisfaction decreased as the duration of the diet program prolonged, regardless of the type of diet applied. It was also determined that there was a linear relationship between dietary satisfaction and QOL although the correlation was not very strong for this group. However, dietary satisfaction could be expected especially in groups that were likely to benefit from dieting, as losing weight, and controlling disease

symptoms and this would increase the QOL. To increase the sustainability of diet programs, dietitians may be recommended to carefully monitor their patients/clients and to take precautionary measures against factors that could lead to dissatisfaction and decrease, their motivation. In this context, the newly validated diet satisfaction scale can be applied by dietitians in hospitals and health institutions to patients following diet programs. Further studies analyzing the supportive factors in terms of supporting dietary compliance are needed.

The major limitation of the study was that patients were recruited from a single health center. Although the rate of participation in this study was high, similar studies can be conducted in multiple health institutions with patients with varying demographic characteristics. It is recommended that future studies involve a multidisciplinary team to address other confounding factors, such as physical activity levels and psychological support.

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