

Social Desirability, Mediterranean Diet, and Body Appreciation: Exploring Relationships Through Mediation Analysis

Sosyal Arzu Edilebilirlik, Akdeniz Diyeti ve Beden Beğenisi: Aracılık Analizi Yoluyla İlişkilerin Araştırılması

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ABSTRACT

Introduction: This study examines the relationships between social desirability, body appreciation, and adherence to the Mediterranean diet across different Body Mass Index (BMI) categories.

Material and Methods: A cross-sectional study was conducted with 254 randomly selected individuals aged 18–40 at a foundation university. Those with problematic eating behaviors and pregnant or lactating women were excluded. Participation was voluntary, and ethical approval was obtained. Data were collected via face-to-face interviews using a sociodemographic form, adherence to the Mediterranean diet, Body Appreciation, and the Social Desirability Scale. Statistical analyses were performed using IBM Statistical Package for Social Sciences (SPSS) program version 23 and AMOS version 24, employing Pearson correlation and bootstrap methods (5000 resamples, $p < 0.050$).

Results: Among underweight individuals, higher social desirability is linked to lower adherence to the Mediterranean diet and decreased body appreciation. Similarly, in normal-weight individuals, increased social desirability correlates with reduced adherence to the Mediterranean diet scores and lower positive body appreciation. However, in overweight and obesity categories, the direct effects of social desirability on adherence to the Mediterranean diet and Body Appreciation are not statistically significant. Additionally, social desirability (SD) indirectly influences adherence to the Mediterranean diet, suggesting that body appreciation is partly mediated by dietary adherence, particularly in underweight individuals.

Conclusion: These findings highlight the complex interactions between social desirability, body appreciation, and dietary adherence across BMI categories. Understanding these relationships emphasizes the importance of social and dietary factors in shaping body image and health behaviors. The results can inform future interventions and health programs to promote positive body image and healthy eating habits in individuals with different BMI statuses.

Keywords: Body image, psychological well-being, mediterranean diet, social behavior

ÖZ

Giriş: Bu çalışma, farklı Beden Kitle İndeksi (BKİ) kategorilerinde sosyal beğenirlik, beden beğenisi ve Akdeniz diyetine uyum arasındaki ilişkileri incelemektedir.

Materyal ve Metodlar: Kesitsel çalışma, bir vakıf üniversitesinde 18–40 yaş arası rastgele seçilen 254 birey ile gerçekleştirilmiştir. Problematik yeme davranışları olan bireyler ile hamile veya emziren kadınlar çalışmaya dâhil edilmemiştir. Katılım gönüllülük esasına dayalı olup etik onay alınmıştır. Veriler, sosyodemografik form, Akdeniz Diyetine Uyum, Beden Takdiri ve Sosyal Beğenirlik Ölçeği kullanılarak yüz yüze görüşmeler yoluyla toplanmıştır. İstatistiksel analizler IBM Sosyal Bilimler İstatistik Paket Programı (SPSS) sürüm 23 ve AMOS sürüm 24 programları ile Pearson korelasyonu ve “bootstrap” yöntemleri (5000 tekrar, $p < 0,050$) kullanılarak yapılmıştır.

Bulgular: Zayıf bireylerde, sosyal beğenirlik arttıkça Akdeniz diyetine uyum azalmakta ve beden beğenisi düşmektedir. Benzer şekilde, normal kilolu bireylerde de artan sosyal beğenirlik, daha düşük Akdeniz diyetine uyum skorları ve azalan beden beğenisi ile ilişkilidir. Ancak, fazla kilolu ve obezite kategorilerindeki bireylerde, sosyal beğenirliğin Akdeniz diyetine uyum ve beden beğenisi üzerindeki doğrudan etkileri istatistiksel olarak anlamlı bulunmamıştır. Ayrıca, sosyal beğenirliğin Akdeniz diyetine uyum üzerindeki dolaylı etkileri, özellikle zayıf bireylerde beden beğenisinin kısmen diyet uyumu aracılığıyla etkilendiğini göstermektedir.

Sonuç: Bu bulgular, sosyal beğenirlik, beden beğenisi ve diyet uyumu arasındaki karmaşık ilişkileri ortaya koymaktadır. Bu ilişkilerin anlaşılması, beden imajı ve sağlıkla ilgili davranışları şekillendirmede sosyal ve beslenme faktörlerinin önemini vurgulamaktadır. Sonuçlar, farklı BKİ gruplarındaki bireyler için olumlu beden imajı ve sağlıklı beslenme alışkanlıklarını teşvik eden müdahaleler ve sağlık programlarının tasarımına rehberlik edebilir.

Anahtar Sözcükler: Beden imajı, psikolojik iyilik hali, akdeniz diyeti, sosyal davranış

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Introduction

The complex etiology of obesity cannot be solely explained by physical health factors; social and psychological factors also play crucial roles in its development (1). Body image is a complex concept encompassing individuals' feelings, thoughts, and attitudes towards their own bodies, including aspects related to appearance, functionality, and performance (2). Developing a positive body image involves not only the absence of body dissatisfaction but also includes valuing one's body, paying attention to its needs, and processing body-related information in a self-protective manner (3). This construct goes beyond the absence of negative body image and represents a separate structure that includes acceptance, respect, and a positive outlook towards one's own body (4). The development of a positive body image has been associated with increased psychological well-being and establishing a healthier relationship with one's body (5). This positive link indicates that body image plays a significant role not only at a physical level but also at emotional and psychological levels. A positive view of one's body enhances psychological well-being, elevates life quality, and facilitates the establishment of a more positive and harmonious relationship with the body (6). Similarly, adherence to the Mediterranean Diet has been linked to various health benefits, including reducing the risk of cardiovascular diseases, certain cancer types, and cognitive disorders like Alzheimer's disease. Compliance with this dietary pattern has many positive effects on health and contributes to an increased life expectancy (7). The Mediterranean Diet provides essential nutrients for the body's well-being while also being recognized for its protective properties against various illnesses. A significant parallelism is observed between these two associations. Developing a positive body image and adhering to the Mediterranean Diet both contribute positively to individuals' physical and psychological health. The combination of positive feelings towards one's body and healthy eating habits represents an important synergy for overall health and well-being. Therefore, fostering a positive body image and adopting healthy eating habits are crucial steps towards achieving health goals and maintaining a healthy life. However, recent trends show a decline in adherence to the Mediterranean Diet among children and adolescents, raising concerns about future health issues (8). Hence, understanding the factors influencing dietary compliance is of utmost importance. Factors such as age, nationality, gender, preferences, nutrition knowledge, physiological status, and psychological factors play a role in determining individuals' dietary choices (9). Social desirability, body image and eating attitudes are closely interrelated psychosocial factors that significantly influence health-related behaviors. Research suggests that individuals often conform their self-reported eating habits to societal norms, which can make it difficult to assess actual eating behaviors. Positive body image is associated with healthier eating attitudes, while body dissatisfaction is associated with dysfunctional eating behaviors (10). A systematic review conducted by Bonfanti et al. shows that social comparisons caused by social

media increase body image concerns and as a result, disordered eating behaviors may occur (11). This study aims to examine the relationships between obesity and body image by considering Body Mass Index (BMI) categories, and explore the associations between social desirability, adherence to the Mediterranean Diet, and body appreciation.

Material and Methods

Participants

This observational cross-sectional study is carried out with procedures in the age range of 18–40, with observations collected at the Faculty of Health Sciences, a foundation university organization, between April and September 2022. The sample size required for the study was determined through power analysis using the G*Power software. Accordingly, the required sample size for the F test interval with 90% power to reveal an effect of medium effect size ($d=0.25$) was calculated as 254. The study group was selected from undergraduate students studying in different faculties of a university by simple random sampling method. Inclusion criteria included being between the ages of 18–65, voluntarily agreeing to participate in the study and signing the informed consent form. Exclusion criteria were as follows: not having a psychiatric diagnosis and/or not receiving active psychiatric treatment, not applying a special nutritional treatment due to a chronic disease, and filling out the questionnaire forms incompletely or incorrectly. The classification of BMI was conducted according to the criteria set by the World Health Organization. Based on these guidelines, participants were categorized as follows: underweight (<18.5 kg/m²), normal weight (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥ 30.0 kg/m²). This study was conducted in accordance with the 2018 Declaration of Helsinki. Informed consent was obtained from all participants. The scheme of this program was approved by the Non-Interventional Clinical Research Ethics Committee of Yüksek İhtisas University with the decision dated 10.03.2022 and numbered 2022/04/02.

Data collection tools

For the purpose of determining the demographic data of the participants, the researchers developed a sociodemographic data form. This form was tailored specifically to align with the objectives of the research. Face-to-face interviews were conducted with the participants, during which the sociodemographic data form was administered along with relevant scales. The researchers employed this comprehensive approach to ensure the accurate and reliable collection of essential information from the participants. By utilizing face-to-face interactions and incorporating standardized scales, the data collection process aimed to capture a comprehensive overview of the sociodemographic characteristics of the participants involved in the study.

Mediterranean Diet Adherence Screener (MEDAS):

The scale is a questionnaire consisting of 14 questions. The Turkish adaptation and validity-reliability of the MEDAS were performed by Pehlivanoglu, et al. in 2020. In the questionnaire, the type of basic oil used by the patients in meals, the amount of olive oil consumed daily, fruit and vegetable portions, margarine/butter and red meat consumption, weekly consumption of wine, pulses, fish-seafood, snacks, shellfish, consumption of nuts, cakes, tomato sauce with olive oil and whether white meat is preferred more than red meat. 1 or 0 points are taken for each question asked according to the amount of consumption, and the total score is calculated. A total score of 7 and above indicates that the individual has an acceptable degree of adherence to the Mediterranean diet, and a score of 9 and above indicates that the individual has a strict adherence to the Mediterranean diet. As a result of the questionnaire, it is learned that the patient has or does not have a Mediterranean type diet (12).

Body Appreciation Scale-2 (BAS): In order to assess the body appreciation status of the participants, the researchers employed the Turkish version of the BAS, which was developed by Tylka and Wood-Barcalow in 2015 to measure individuals' positive thoughts about their own bodies and the level of respect they have for these thoughts (13). The BAS is a 5-point Likert-type measurement tool, consisting of 10 items. Unlike the original version, BAS does not include any reverse items. Participants rate each item on a scale from 1 to 5, with a minimum total score of 10 and a maximum of 50 points achievable on the scale. By summing the scores of all items, a total score is obtained for each participant. A lower score on the BAS indicates that individuals have a more negative body appreciation, while a higher score reflects a more positive body appreciation. In other words, higher scores on the scale suggest that individuals possess a greater level of positive thoughts and respect towards their bodies (13).

Social Desirability Scale (SDS): To investigate the role of social desirability in our study, the researchers utilized the Turkish version of the SDS, which was developed by Erzen et al. in 2021. The SDS is designed to assess the social desirability levels of individuals and comprises a total of 15 items, presented in a 5-point Likert format. In the final form of the SDS, there are no reverse-scored items, meaning that all items are positively oriented. Consequently, participants are asked to rate each item on a scale ranging from 1 to 5, without any negatively phrased questions. The absence of sub-dimensions with negative content within the scale allows for the computation of a total score, which determines the overall level of social desirability exhibited by each individual (14).

Data Analyses

The data were analyzed using IBM Statistical Package for Social Sciences (SPSS) program version 23 and IBM AMOS version 24 software. Pearson correlation coefficient was used to examine

the relationship between normally distributed continuous variables. To test the hypothesized mediation models, bootstrap-based mediation analyses were conducted using the Maximum Likelihood estimation method in AMOS. In these analyses, 5.000 bootstrap resamples were used to estimate 95% bias-corrected confidence intervals (CI) for the direct, indirect, and total effects. Mediation was considered statistically significant when the 95% CI did not include zero. The significance level for all statistical tests was set at $p < 0.050$. These analyses were performed to evaluate the presence and strength of mediation effects of body appreciation and adherence to the Mediterranean diet in the relationship between social desirability and the outcome variables, across different BMI classifications.

Results

Table 1 presents the demographic characteristics of the participants in the study. Out of the total participants, 87.3% were women and 12.7% were men. The mean weight of the participants was 61.2 (± 12.6) kg, while the mean height was 166.3 (± 12.2) cm. The participants had an mean BMI of 21.9 (± 3.7) kg/m². Regarding BMI classification, 70.8% of the participants were categorized as having a normal BMI, indicating a healthy weight range for their height. In contrast, 15.7% were classified as underweight, 10.1% as overweight, and 3.4% as obese. In terms of health behaviors, 19.9% of the participants reported consuming alcohol, and an equal percentage (19.9%) identified as smokers. Concerning meal habits, the majority of the participants (81.6%) reported consuming between 1 to 3 meals per day. Among those who skipped meals, 34.5% indicated that they did not have a habit of skipping meals

Table 2 presents the descriptive statistics of the scales used in the study. The mean MEDAS score was 5.8 ± 1.9 , with a median of 6.0, indicating that participants, on average, demonstrated low adherence to the Mediterranean diet. This score is below the threshold of 7 for acceptable adherence and significantly lower than the 9-point cut-off indicating strict adherence (12). The mean score on the Body Appreciation Scale-2 (BAS-2) was 37.3 ± 8.1 . While the scale does not have a defined cut-off value, higher scores indicate more positive body image. The mean Social Desirability Scale (SDS) score was 33.1 ± 8.2 . Similar to BAS-2, this scale does not have a cut-off point; however, higher scores are indicative of greater tendencies toward socially desirable responding.

Table 3 presents the results of the examination of the relationship between the scales used in the study. Regarding the relationship between the MEDAS and the BAS, a positive correlation coefficient of 0.160 was observed, indicating a weak positive relationship between the two scales. The p-value of 0.009 suggests that this correlation is statistically significant at the 0.05 significance level, indicating that the relationship is not likely due to random chance. Similarly, when examining

Table 1. Demographic characteristics of the participants

	Frequency (n) / mean $\pm$ standard deviation
Gender	
Woman	87.3%
Man	12.7%
Weight	61.2 $\pm$ 12.6
Height	166.3 $\pm$ 12.2
BMI mean	21.9 $\pm$ 3.7
BMI	
Underweight	15.7%
Normal weight	70.8%
Overweight	10.1%
Obese	3.4%
Age year	26.4 $\pm$ 3.1
Smoking situation	
No	80.1%
Yes	19.9%
Alcohol consumption	
No	80.1%
Yes	19.9%
How many meals do you eat per day?	
1–3	81.6%
>3	18.4%
Reason for skipping meals*	
I eat two meals	0.4%
I have no habit	34.5%
I don't skip	0.4%
I don't want	26.6%
I have no appetite	26.6%
I don't skip meals	1.5%
Because I forgot	10.1%
Lack of time	24.0%
I want to lose weight	19.9%

* Multiple response.

Table 2. Descriptive statistics of the scales used in the study

Scale	Score range	Mean $\pm$ SD	Median (min–max)
MEDAS	0–14	5.8 $\pm$ 1.9	6.0 (1.0 – 12.0)
Body appreciation (BAS-2)	10–50	37.3 $\pm$ 8.1	38.0 (14.0 – 50.0)
Social desirability (SDS)	15–75	33.1 $\pm$ 8.2	33.0 (16.0 – 64.0)

Table 3. The relationship between the scales

		MEDAS	BAS-2
MEDAS	r	-	
	p	-	
BAS-2	r	0.160	-
	p	0.009	-
SDS	r	-0.196	-0.250
	p	0.001	<0.001

r: Pearson correlation coefficient.

the relationship between MEDAS and the SDS, a negative correlation coefficient of -0.196 was found. This indicates a weak negative relationship between adherence to the Mediterranean diet and social desirability. The p-value of 0.001 suggests that this correlation is statistically significant at the 0.05 significance level. Furthermore, the relationship between BAS-2 and SDS was also investigated. A negative correlation coefficient of -0.250 was obtained, indicating a weak negative relationship between body appreciation and social desirability. The p-value for this correlation was found to be less than 0.001, which indicates that this relationship is statistically significant at the 0.05 significance level.

The results of Table 4 show the examination of total, direct, and indirect effects between SDS, BAS, and MEDAS for participants with different body mass indexes. Regarding the total effects, significant negative relationships were observed between Social Desirability and MEDAS for participants with underweight, normal, and obese body mass indexes (total effects: -0.467, -0.692, and -0.375, respectively; $p < 0.050$). However, for those with overweight body mass index, the total effect of Social Desirability on MEDAS was not statistically significant (total effect: -0.101; $p > 0.050$). This indicates that higher levels of Social Desirability are associated with lower adherence to the Mediterranean diet in individuals with underweight, normal, and obese body mass indexes. Regarding the direct effects, a significant negative relationship was found between Social Desirability and Body Appreciation for participants with underweight body mass index (direct effect: -0.46; $p < 0.050$). However, for those with normal and overweight body mass indexes, the direct effect of Social Desirability on Body Appreciation was not statistically significant (direct effects: 0.305 and -0.104, respectively; $p > 0.050$). This suggests that higher levels of Social Desirability are associated with lower body appreciation in underweight individuals. Moreover, a significant negative relationship was observed between Social Desirability and MEDAS for participants with normal and obese body mass indexes (direct effects: -0.653 and -0.309, respectively; $p < 0.050$). However, for those with underweight and overweight body mass indexes, the direct effect of Social Desirability on MEDAS was not statistically significant (direct effects: -0.289 and -0.096, respectively; $p > 0.050$). This indicates that higher levels of Social Desirability are associated with lower adherence to the Mediterranean diet in individuals with normal and obese body mass indexes. Regarding the indirect effects, for participants with underweight body mass index, the indirect effect of Social Desirability on MEDAS was statistically significant (indirect effect: -0.178; $p < 0.050$). However, for those with normal, slightly obese, and obese body mass indexes, the indirect effects of Social Desirability on MEDAS were not statistically significant (indirect effects: -0.039, -0.004, and -0.066, respectively; $p > 0.050$). This suggests that the indirect effects of Social Desirability on adherence to the Mediterranean diet were only significant for individuals with underweight body mass index.

Table 4. Examination of intermediary model results according to BMI classes

BMI classification	Independent variable	Total effect		Direct effect		Indirect effect	
		BAS	MEDAS	BAS	MEDAS	BAS	MEDAS
Underweight	SDS	—	-0.467 (-0.697; -0.178) a*	-0.46 (-0.715; -0.13) c*	-0.289 (-0.601; 0.01) ab**	—	-0.178 (-0.332; -0.016)*
	BAS	—	—	—	0.387 (0.068; 0.619) a*	—	—
	R ²	0.218		0.212	0.336		
Normal weight	SDS	—	-0.692 (-0.92; -0.283) a*	0.305 (-0.308; 0.768) a**	-0.653 (-1.089; -0.207) a*	—	-0.039 (-0.199; 0.375)**
	BAS	—	—	—	-0.128 (-0.646; 0.559) b**	—	—
	R ²	0.478		0.093	0.493		
Overweight	SDS	—	-0.101 (-0.379; 0.2) b**	-0.104 (-0.329; 0.14) ab**	-0.096 (-0.375; 0.208) b**	—	-0.004 (-0.051; 0.029)**
	BAS	—	—	—	0.042 (-0.176; 0.255) b**	—	—
	R ²	0.010		0.011	0.012		
Obese	SDS	—	-0.375 (-0.536; -0.186) a*	-0.38 (-0.605; -0.11) bc*	-0.309 (-0.508; -0.07) ab*	—	-0.066 (-0.199; 0.025)**
	BAS	—	—	—	0.174 (-0.071; 0.419) ab**	—	—
	R ²	0.14		0.144	0.166		

BAS: body appreciation; SDS: social desirability; a-c: no difference between effects with the same letter; different letters indicate a statistically significant difference; *p<0.050;

**p>0.01; β (95% CI): standardized effect (Bootstrap 95% confidence interval).

Discussion

In this study, the interactions between obesity, body image, and the Mediterranean diet were examined by considering BMI classifications and the levels of social desirability, MEDAS, and body appreciation. Our findings provide important insights and contribute to the development of health policies and interventions. However, this study also demonstrates the significant impact of psychosocial factors, such as body image and social desirability on obesity. Body image is a complex concept that encompasses individuals' feelings and evaluations of their own bodies. Our results show a negative relationship between obesity and positive body image. Individuals in the underweight had higher body appreciation compared to those in the obese. This suggests that positive body image may play a role in reducing the risk of obesity. Accordingly, the first hypothesis of the study suggested that the indirect effect of social desirability on MEDAS adherence would be more effective only in individuals with underweight. The findings supported this hypothesis, revealing that greater adherence to MEDAS was associated with decreased social desirability, and this effect was particularly evident in underweight participants. Although previous research has not directly examined this conditional indirect effect, it was not unexpected. Earlier studies have established a relationship between body appreciation and eating behaviors (15). Our results indicate a protective role of body appreciation specifically for underweight individuals. These findings are in line with the concept of positive body image research, indicating that body appreciation is associated with higher resistance to sociocultural pressures towards appearance, less internalization of beauty ideals, and more positive adherence to MEDAS (16). The results of this study contribute new empirical data suggesting that positive body image may protect underweight individuals from the detrimental effects of internalizing stereotyped underweight body ideals in social desirability and increase adherence to MEDAS in the presence of such internalization.

The second hypothesis proposed that the relationship between MEDAS adherence and social desirability would be negatively moderated only in individuals with weak body appreciation. This hypothesis was also supported. Social desirability level played a significant moderating role in the relationship between obesity and body image. Individuals with high social desirability were more prone to negative body image and obesity. These consistent findings support the idea that individuals with social desirability sensitivity may experience a decrease in diet adherence. Moreover, the nonsignificant direct effects observed in the overweight and obese groups may reflect the tendency of individuals in these categories to report their health behaviors differently due to social approval concerns, as discussed by Puhl and Heuer (17). Thus, the differential influence of social desirability on eating attitudes and body image across BMI categories is a phenomenon supported by the literature and represents a novel contribution of the present study. Our findings are consistent with the significant results regarding the negative relationship between social desirability and MEDAS, as well as the tendency towards bias, which is an important limitation in diet therapy research, as mentioned in Lorigeril et al.'s study. This result indicates that social norms and expectations can influence body image and obesity risk. Therefore, measures and policies aimed at reducing negative body image caused by societal norms and social expectations are necessary. Additionally, in our study, a positive relationship between adherence to the Mediterranean diet and body image was found. It is suggested that the Mediterranean diet may positively influence body image, leading individuals to have a more positive perception of their bodies. The Mediterranean diet has emerged as a comprehensive lifestyle that includes not only specific foods and meal composition but also behavioral and social aspects, such as the production of specific foods, social exchange, and communication (18). The results of this study support the notion that adherence to the Mediterranean diet includes some social behaviors (19). Overall, this study

provides important insights into the complex relationships between obesity, body image, and the Mediterranean diet, taking into account BMI classes and social desirability. These findings highlight the relevance of psychosocial factors in obesity and body image, and emphasize the importance of considering social desirability and body appreciation in dietary interventions, particularly for underweight individuals. Moreover, the positive association between adherence to the Mediterranean diet and body image suggests that promoting the Mediterranean diet may contribute to fostering positive body image in individuals.

In this study, there are some limitations. Firstly, the participants of this study were selected from a specific geographical region, which may limit the generalizability of the findings. Including participants from different geographical regions and cultural backgrounds could enhance the applicability of the results to a wider population. Secondly, this study has an observational design, which does not allow for establishing causal relationships between the variables. Therefore, to fully understand the directional and causal nature of the relationships between social desirability, adherence to the Mediterranean diet, and body appreciation, future prospective experimental studies are needed. Thirdly, the data collection tools used in this study rely on self-reporting by the participants regarding their social desirability, dietary habits, and body appreciation. Self-report responses may be influenced by participants' personal perceptions and memory, which could introduce accuracy and recall biases. Lastly, this study only examined the relationships between social desirability, adherence to the Mediterranean diet, and body appreciation. Not considering the effects of other potential factors (e.g., age, gender, education level, psychological status, etc.) may result in incomplete explanations of the findings, especially in terms of interactive effects. Despite these limitations, this study contributes to the understanding of the complex interactions between social desirability, adherence to the Mediterranean diet, and body appreciation across different BMI classes. Future research, taking these limitations into account, can utilize data from a broader and more diverse range of participants to achieve more comprehensive results.

Specifically, it aims to evaluate different interactions among underweight, normal weight, overweight, and obese individuals, providing valuable insights to guide the development of health policies and interventions related to obesity and body image. The knowledge gap missing from previous literature and targeted by this study is that it has not been clarified how physical and psychological health problems caused by obesity or risk factors can be addressed with effective interventions. The findings of this research may contribute to the design of appropriate and effective interventions in the healthcare field and help improve individuals' physical and psychological health, thereby preventing future health issues.

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