

Article

Dietary Habits and Obesity in Patients with Psychotic Disorders in Rural Areas in Northwestern Greece

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Abstract: People suffering from psychotic disorders display high rates of physical morbidity and mortality in comparison to the general population. The present study explores the relation between the dietary habits, the prevalence of obesity and the occurrence of physical morbidity in patients who suffer from psychotic disorders in rural regions of northwest Greece. Two scales were applied to evaluate the quality of life (Quality of Life Questionnaire II, Moorehead–Ardelt) and the dietary habits (Dietary Instrument for Nutrition Education (DINE) Questionnaire) of these patients. The study sample used in this study consisted of 55 patients who suffered from a psychotic disorder. Most (75%) were male, with a mean age of 51.5 years and an average duration of disease of 25.1 years. Of these, 38.2% (21 patients) were obese with a BMI < 30 Kg/m², 32.7% (16 patients) were overweight and 29.1% had a normal body weight. The majority of the sample, 80%, was treated with second-generation medications. With regards to their dietary habits, 94.5% (52/55) of the sample showed a low intake of fiber content, 67.3% (37/55) showed a high intake of saturated fats and 100% (55/55) a low intake of unsaturated fats. The rates of physical morbidity in the present sample were 21.8% with at least one disease and 14.5% with two diseases, whereas 5.5% met the criteria for metabolic syndrome (MS). The average BMI of the women was statistically significantly higher compared to the men. The majority of the sample (69.1%) exhibited acceptable levels of quality of life. No co-relations of quality of life with BMI were found. In addition, no co-relations of BMI with dietary habits were revealed.

Keywords: dietary habits; obesity; psychotic disorders; schizophrenia; metabolic syndrome; quality of life; rural Greece



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1. Introduction

Mental disorders, such as schizophrenia, may be chronic and disabling and cause increased morbidity to patients and significant burden to their families and the health system [1]. People with schizophrenia have an increased (2–3 times or more) risk of mortality compared to the general population. The life expectancy of these patients is reduced by 20% or about 15 years compared to the general population, mainly due to the early onset of a cardiovascular disease [2,3]. Early mortality can be mostly (60%) attributed to natural causes such as cardiovascular diseases, respiratory diseases, infections and cancer. Non-natural causes of death, such as suicide and accidents, account for almost 40% of deaths in patients with schizophrenia. Other contributing factors are an unhealthy lifestyle, the side effects of antipsychotic drug treatment and the patients' refusal to undergo treatment for physical morbidity [2,4–11]. The high prevalence of obesity in people with schizophrenia has been of great interest and a subject of extensive study. Obesity is more prevalent in patients with schizophrenia compared to the general population in developed

countries. The reported obesity rates among patients with psychotic disorders range from 46–79% [12,13] and is a risk factor for several serious diseases such as cardiovascular and respiratory diseases, metabolic syndrome, diabetes and various forms of cancer [2]. Obesity is adversely related to the patients' quality of life [14], mainly due to the disability and incapacity that affects the individual. Decreased quality of life is mainly related to the increased body weight experienced as a problem by the individual, regardless of age and gender. Previous studies have suggested that the presence of metabolic syndrome is associated with poor physical health, while being overweight and obese is associated with low psychosocial adaptation, lower self-esteem and poor quality of life [15]. The fact that obesity is the most visible among all metabolic disorders should sensitize psychiatrists and mental health professionals to pay the necessary attention to the physical health of patients and to take the necessary steps to improve their quality of life [16]. Several findings from previous studies show that the dietary routine of patients with schizophrenia is mainly characterized by a high intake of saturated fatty acids and salt, as well as by a low content of fiber and vitamins, compared to healthy diets [17]. Such a diet is more likely to increase the risk of obesity and metabolic disorders. In Greece, to the best of our knowledge, there is no current research concerning the dietary habits of patients with psychotic disorders. The main objective of the present study was to assess the dietary patterns and the prevalence of obesity and physical morbidity in patients with psychotic disorders who live in rural areas in Greece and receive care by a community mental health service.

2. Materials and Methods

2.1. The Study Setting

Mental healthcare in rural Greece is mostly delivered by mobile, interdisciplinary community mental health teams, the so-called mobile mental health units (MMHUs). In the region of Epirus, northwest Greece, the MMHU of the prefectures of Ioannina and Thesprotia (MMHU I-T) delivers services for a population of about 100,000 residents in remote, mountainous areas [17,18]. MMHUs in rural Greece prioritize patients with psychotic disorders since such patients have increased needs [18]. It has been previously shown that treatment engagement rates of patients with psychotic disorders with the MMHU I-T are high [19].

2.2. Study Design

This is a cross-sectional study. All patients with a diagnosis of a psychotic disorder (F20–F29), according to the International Classification of Disorders—10th revision (ICD-10), that were engaged in treatment with the MMHU I-T (that is, they regularly attended scheduled follow-up appointments) were examined over a 6 month period (June–November 2016), according to their regular follow-up schedule. We included patients who were clinically stable, who received antipsychotic treatment for at least three months before the study entry, patients who could communicate in the Greek language and who lived in the catchment area. Patients that were too disorganized to be interviewed or to provide informed consent, as well as patients with comorbid moderate or severe mental retardation were excluded from the study. All the procedures of the study were approved by the institutional board. Written informed consent was obtained from all participants. Two researchers interviewed the participants and collected the data. Data acquisition involved socio-demographic information (gender, age, educational level, professional status, financial profile, marital status, lifestyle, etc.) and clinical information (age of onset and duration of the disease, number of hospitalizations, medication regimen and comorbidities). We used two scales to assess the eating habits and the quality of life of the patients.

2.2.1. The Dietary Instrument for Nutrition Education (DINE) Questionnaire

The DINE is a semi-quantitative food frequency questionnaire and a nutrition assessment tool which is applied in health promotion programs in primary healthcare as a nutrition assessment tool [20]. It is a structured questionnaire that provides a brief initial as-

assessment of total fat and fiber intake and saturated and unsaturated fatty acids intake. The respondents are categorized into high (>40 score), medium (30–40 score) or low (<30 score) intake, based on the sum they give in each category. This structured questionnaire does not require specialized nutritional knowledge, it can be administered by primary care professionals and the respondent can complete it in less than 10 minutes. This scale was not translated and validated in Greek language. Thus, in order to produce an adapted questionnaire, we followed a process based on the minimal translation criteria. The group responsible for the English to Greek translation consisted of three independent, experienced bilingual researchers. Afterwards, the questionnaire was back-translated into Greek. Following the translation and back-translation, a cognitive debriefing process was used to recognize any language problems and to evaluate the degree to which a respondent's understanding of each item matched the content meant to be elicited. The validity was checked by experts invited to review the translated version of the DINE. They reviewed the questionnaire and were asked specific questions by the researchers as to whether the translation was culturally and linguistically correct, as well as whether the wording in the questionnaire was straightforward and distinct, not ambiguous. For better adaptation, pints were converted to ml.

2.2.2. The Quality of Life Moorehead–Ardelt Questionnaire II

The Moorehead–Ardelt Quality of Life Questionnaire II (M-A-QoLQII) was originally designed as a disease-specific instrument measuring postoperative outcomes of self-perceived QoL in obese patients [21]. M-A-QoL QII consists of 6 questions. Each one can be evaluated on a 10-point scale and with a score from -0.5 to $+0.5$ with a rating of 0.1 for each box from left to right. The left side represents the worst and the right side the best quality of life level. The score of the individual questions are then combined and the final score can range from -3 to $+3$. Scores between 2.1 to 3 are considered very good, 1.1 to 2 good and -1 to 1 acceptable. It examines six key areas: self-esteem, physical activity, social interactions, work ability, sex life and eating behavior. It is a simple test, and the participant can complete it in less than one minute. However, the patients of the present study required more time to complete it because some of the scale questions needed further explanation. To analyze our data, we used the SPSS 25 and we performed *t*-tests for continuous variables or chi-square tests for categorical variables. In addition, a Fisher's test and logistic regression analysis were carried out.

2.3. Statistical Methodology

Data were imported into IBM SPSS, version 25 (IBM Corp., Armonk, NY, USA), for analysis and interpretation. Continuous variables were expressed as mean (M) with standard deviation (SD) and median (Mdn) with interquartile range (IRQ). Absolute numbers (N) and percentages (N%) were used to express categorical variables. Due to the non-satisfaction of the condition of normality and the small sample size, we used non-parametric tests. We used the Mann–Whitney U test to compare differences between two independent groups. The Spearman coefficient was used to correlate two continuous variables. For all tests, statistical differences were determined to be significant at $p < 0.05$.

3. Results

Over the study period, a total of 77 treatment-engaged patients with psychotic disorders were examined, and they were approached for participation. Twenty-two met the exclusion criteria or refused to participate, and 55 patients were interviewed. The mean age of the included patients was 51.5 years (SD = 12.4, Mdn = 54, IRQ = 39 to 62). Forty-one patients (75%) were men, and the mean duration of psychosis was 25.1 years (SD = 13.4, Mdn = 28, IRQ = 14 to 35). The majority of patients (39 out of 55, 70.9%) were living with parents or siblings (Table 1). Most patients (80%) were treated with second-generation antipsychotic medication and 54.5% were smokers. Concerning physical health morbidity, 58.2% of the participants had no chronic or acute diseases, 21.8% had at least one disease, 14.5% had

two physical diseases and 5.5% met the criteria for metabolic syndrome. The mean body mass index (BMI) was 29.3 kg/m² (SD = 6.8, Mdn = 28.3, IRQ = 24.1 to 32). Twenty-one patients (38.2%) were obese (BMI > 30 Kg/m²) and 16 patients (32.7%) were overweight (BMI: 25–29.9 Kg/m²). The average BMI of women was statistically significantly higher compared to men ($p = 0.02$).

Table 1. Socio-demographic characteristics (N = 55).

Characteristics	N	%
Gender		
Male	41	75
Female	14	25
Marital Status		
Single	42	76.4
Married	6	10.9
Divorced	5	9.1
Widowed	2	3.6
Educational Background		
Illiterate	10	18.2
Primary	9	16.4
Secondary	29	52.7
Tertiary	7	12.7
Housing Situation		
Parents/Siblings	39	70.9
Alone	16	29.1
Occupational Status		
Unemployed	43	78.2
Employed	3	5.5
Retired (Pensioners)	9	16.4

The mean score of M-A-QoL QII scale was 0.27 (SD = 1.2, Mdn = 0, IRQ = −0.6 to 1), thus it is categorized as acceptable. The mean score of DINE fiber scale was 19.7 (SD = 5.8, Mdn = 20, IRQ = 15 to 23), and it is rated as low grade. The mean score of DINE fat scale was 33.3 (SD = 10, Mdn = 33, IRQ = 25 to 42), thus it is rated as medium grade and the mean score of DINE unsaturated scale was 11.8 (SD = 0.71, Mdn = 12, IRQ = 12 to 12), thus it is categorized as low grade (Table 2).

Table 2. Dietary Instrument for Nutrition Education (DINE) Questionnaire and Moorehead–Ardelt Quality of Life Questionnaire II classification (M-A-QoL QII).

		N (55)	%
M-A-QoL QII	Very good	2	3.6%
	Good	11	20.0%
	Acceptable	42	76.4%
DINE Fiber	High	0	0.0%
	Medium	3	5.5%
	Low	52	94.5%
DINE Fat	High	37	67.3%
	Medium	18	32.7%
	Low	0	0.0%
DINE Unsaturated	High	0	0.0%
	Medium	0	0.0%
	Low	55	100.0%

No statistically significant correlation was found between the score of the M-A-QoL QII scale and BMI ($\rho(55) = -0.078$, $p = 0.570$). Similarly, no statistically significant correlation was found between the score of the M-A-QoL QII scale and age ($\rho(55) = -0.049$, $p = 0.724$) or gender ($U(N_{\text{male}} = 41, N_{\text{female}} = 14) = 277$, $z = -0.194$, $p = 0.846$). Housing situa-

tion ($U(N_{\text{parents/siblings}} = 39, N_{\text{alone}} = 16) = 250.5, z = -1.143, p = 0.253$) also was not correlated to the score of the M-A-QoL QII scale. The score of the DINE fiber scale was found not to be statistically significantly correlated to BMI ($\rho(55) = 0.155, p = 0.259$), age ($\rho(55) = 0.050, p = 0.716$) or gender ($U(N_{\text{male}} = 41, N_{\text{female}} = 14) = 238, z = -0.950, p = 0.342$). In addition, no statistically significant correlation was found between the score of the DINE fiber scale and the housing situation ($U(N_{\text{parents/siblings}} = 39, N_{\text{alone}} = 16) = 299, z = -0.242, p = 0.809$). Regarding the score of the DINE fat scale, the analysis suggested that it was not correlated to BMI ($\rho(55) = 0.121, p = 0.379$). Additionally, no statistically significant correlation was found between the score of the DINE fat scale and age ($\rho(55) = -0.171, p = 0.211$) or gender ($U(N_{\text{male}} = 41, N_{\text{female}} = 14) = 240, z = -0.909, p = 0.363$). Finally, no statistically significant correlation was found between the score of the DINE fat scale and the housing situation ($U(N_{\text{parents/siblings}} = 39, N_{\text{alone}} = 16) = 277, z = -0.649, p = 0.516$). The score of the DINE unsaturated scale was found not to be statistically significantly correlated to BMI ($\rho(55) = -0.183, p = 0.181$), age ($\rho(55) = -0.076, p = 0.583$) and gender ($U(N_{\text{male}} = 41, N_{\text{female}} = 14) = 266.5, z = -0.794, p = 0.427$). No statistically significant correlation was found between the score of the DINE unsaturated scale and the housing situation ($U(N_{\text{parents/siblings}} = 39, N_{\text{alone}} = 16) = 298.5, z = -0.502, p = 0.616$) as well.

4. Discussion

To our knowledge, this is the first Greek study that explores dietary habits and obesity in rural residents with psychotic disorders. It was found that women had a higher BMI compared to men, which is in accordance with previous studies, although the present findings should be interpreted with caution due to the small sample size. A previous Greek study on patients with schizophrenia found that women had higher BMIs than men [22]. Additionally, in the study by Simonelli-Muñoz et al. on a sample of 159 patients with schizophrenia, it was found that women were three times more likely to be obese than men [23]. BMI was not co-related to dietary habits of patients, as measured with the DINE questionnaire in this study. It seems that, in the present sample of patients with chronic psychotic disorders, obesity is accounted for by other reasons, such as disorder-specific factors (e.g., negative symptoms) and lifestyle behaviors (e.g., physical inactivity) [24], that were not assessed in this study. The prevalence of smoking in the individuals in the present study was 54.5%, a finding that coincides with the finding of the study by Li et al. [9]. A previous study in Greece reported a rate of smoking as high as 97.5% in patients with schizophrenia [25]; however, this study mostly involved hospitalized patients. With regards to the quality of life of patients, it was rated as acceptable in more than three-quarters, whereas less than 25% were rated as having good or very good quality of life. It is unclear whether acceptable quality of life, as measured with the M-A-QoL QII scale, is meaningful for the lives of patients with psychotic disorders in rural areas. Indeed, according to a recent meta-analysis of studies using the World Health Organization Quality of Life (WHOQOL) or its brief version or the Short Form-36 Health Survey (SF-36), quality of life in patients with schizophrenia is significantly lower than healthy controls [26]. Interestingly, in the present study, quality of life was found not to be related with BMI or other variables such as age, gender and housing situation. Previous research in the United States and China has shown that the presence of obesity among individuals with schizophrenia or bipolar disorder is associated with decreased HRQOL [27,28]. Perhaps methodological issues and sampling accounted for this difference in the present study.

Concerning the consumption of saturated fats, 67.3% showed high consumption, 32.7% medium and 0.0% low consumption. This finding is in line with the results of previous studies that examined the eating habits of people with a psychotic disorder and showed high consumption of saturated fatty acids [29]. As far as the consumption of unsaturated fatty acids is concerned, we observed that the majority of the participants showed a low consumption of unsaturated fats at a rate of 100.0%. This finding is confirmed by other studies [30]. Our study revealed low consumption of fiber, and this result is in accordance with other studies with similar findings [31].

The differences among the findings of the present study and those of previous international studies on the consumption of total fatty acids could be explained based on the following: (i) Different dietary habits that exist from country to country; (ii) no published data concerning Greece exist on the eating habits of people suffering from a psychotic disorder. The majority of the studies were conducted in Europe (Scotland, Germany, England), Japan, Australia and the USA and present significantly different eating habits. Greece, as a Mediterranean country, bases its diet mainly on the Mediterranean diet, which is characterized by high consumption of olive oil, vegetables, fruits, legumes, fish, etc.; and (iii) another explanation that could be given is that the majority of the participants (70.9%) live with others (parents, spouse, children), something that may contribute to the intake of better quality food as homemade food excels in nutrients over ready-made and fast food. Moreover, the majority of the participants live in rural areas and most of them have to ensure the preparation of their own food. Additionally, their access to groceries and restaurants is difficult as, in the villages of Epirus, their number is limited to non-existent. To our knowledge, this is the first study which studied the eating habits of people with schizophrenia who lived independently in the community in rural areas of northwestern Greece. Based on the international literature, no study was found involving patients in the community from rural areas so that the findings could be directly compared between populations. The majority of studies that have been conducted so far have studied the eating habits of patients who lived mainly in urban centers or in protected psychosocial rehabilitation centers or were treated in psychiatric clinics [10,30,32–35]. Only 5.5% of the participants met the criteria for metabolic syndrome. According to the international literature, the rate of metabolic syndrome in European countries ranges from 26.6–49.6%, [31] and other physical illnesses as follows: hypertension from 19–58%, diabetes from 10–15% and lipids from 25–69% [12]. There is a possibility that the participants might not be aware that they have hypertension. This is mainly due to the negative symptoms and cognitive deficits of the disease that are predominant in chronic patients, preventing them from attending primary healthcare settings for regular physical health checks and monitoring [36]. As mentioned above, the registration of the diseases of the participants was done based on their official medical records that are kept by primary care physicians. Concerning physical morbidity, no statistical analysis was performed due to the small number of patients with metabolic syndrome (5.5%). However, both psychiatrists and primary care doctors encouraged patients to regularly monitor all parameters of the metabolic syndrome, and this might be a contributory factor to the early detection and management of these metabolic disorders. Additionally, the low rates of physical morbidity observed in our study could be attributed to the high consumption of unsaturated fats (olive oil) displayed by the vast majority of the sample. As mentioned above, high consumption of olive oil is associated with a 41% lower risk of cardiovascular disease [37]. Olive oil consumption has been widely studied, specifically in a study conducted in Spain with 7216 participants aged 55–80 years who have a high cardiovascular risk [38]. It was found that the consumption of extra virgin olive oil was associated with a significantly reduced risk of cardiovascular events and mortality. Specifically, it was found that, for every 10 grams of daily consumption of olive oil, there is a reduction of cardiovascular mortality by 16%.

There are some limitations in our study. The data collection was self-reported. This method is prone to both systematic and random errors. Patients may make reporting errors or often misrepresent the foods they consume. The present study is a cross-sectional study, and such studies may not provide definite information about cause-and-effect relationships. This is because such studies offer a snapshot of a single moment in time without being able to collect data prior and after the snapshot is taken. Another limitation is that our sample was small and there was no control group. Additionally, there were no repeated measures of validity of responses in this population and the participants were not randomly selected as described. On the other hand, the sample of participants in the present study may be representative of rural patients with psychotic disorders in Greece because, as

aforementioned, MMHUs in rural Greece may engage in the treatment of the majority of referred patients.

5. Conclusions

Our study revealed that psychotic patients have high rates of overweight and obesity, lower rates of physical morbidity and very low rates of metabolic syndrome. The vast majority of them had a diet low in fiber, moderate in saturated fats but rich in unsaturated fats. No statistically significant correlation was found between eating habits and the prevalence of obesity. The quality of life of the majority of the patients was within acceptable limits. The protective effects of nutrition against physical ailments and obesity is well documented. Therefore, encouraging patients to change eating habits is important. In addition, the cooperation of psychiatrists with mental health professionals and other specialists can contribute to the early detection and treatment of physical illnesses of people suffering from psychotic disorder [39], providing multilevel physical healthcare for these individuals in order to reduce the incidence of physical morbidity. Ill patients residing in rural areas of Greece tend to be at a disadvantage compared to those in urban centers in terms of access to specialized health services and their possible inclusion in training programs designed to reduce their rates of physical morbidity and obesity. In summary, this study, one of the first in Greece to investigate the issue of physical morbidity and eating habits of people suffering from psychotic disorders, provides a basis for further research.

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