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Weight Gain, Mental Symptoms and Self-Esteem in Patients with Schizophrenia

Şizofreni Hastalarında Kilo Alımı, Ruhsal Belirtiler ve Benlik Saygısı

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ABSTRACT

The aim of this study is to examine the weight gain, mental symptoms and self-esteem in patients with schizophrenia undergoing treatment at a community mental health center (CMHC). The study is conducted with 103 schizophrenic patients between 01.08.2021 – 01.02.2022. The data was collected with Personal Information Form, Rosenberg Self-esteem Scale, and Positive and Negative Syndrome Scale (PANSS). 35% of the patients are women, 43.7% are single, and 48.5% are between the ages of 45-64. There was no significant increase between the patients' weigh measurement value in the first month ($\bar{x}$=81.185) and the measurement value at the end of six months ($\bar{x}$=81.320). The decrease in the self-esteem scale mean score at the end of six months ($\bar{x}$=1.317) was not found significant, when compared to the self-esteem scale mean score in the first month ($\bar{x}$=1452). The PANSS General Psychopathology subscale mean score was found to be statistically lower at the end of the six-month follow-up ($\bar{x}$=26.418), compared to the first month mean score ($\bar{x}$=27.136). There was no significant difference between weight gain, self-esteem, and PANSS positive/negative symptoms in the six-month follow-up of patients with schizophrenia enrolled in CMHC. A significant difference was discovered between the first and sixth-month measurements in PANSS general psychopathology symptoms. It is detected that gender, working status, atypical and mixed antipsychotics use, smoking status, and changes in daytime sleeping habits affect mental symptoms.

Keywords: schizophrenia, antipsychotic, weight gain, self-esteem, mental symptom.

ÖZ

Bu çalışmanın amacı, bir toplum ruh sağlığı merkezinde (TRSM) tedavi gören şizofreni hastalarında kilo alımını, ruhsal belirtileri ve benlik saygısını incelemektir. 103 şizofreni hastası ile 01.08.2021-01.02.2022 tarihleri arasında yürütülmüştür. Veriler, Kişisel Bilgi Formu, Rosenberg Benlik Saygısı ölçeği ve Pozitif ve Negatif Sendrom Ölçeği (PANSS) ile toplanmıştır. Hastaların %35'i kadın, %43,7'si bekar, %48,5'i 45-64 yaş aralığındadır. Hastaların ilk ayda kilo ölçüm değeri ($\bar{x}$=81,185) ile altı ayın sonundaki ölçüm değeri arasında ($\bar{x}$=81,320) artış anlamlı bulunmamıştır. İlk aydaki benlik saygısı ölçeği puan ortalamasına ($\bar{x}$=1,452) göre altı ay sonundaki benlik saygısı ölçeği puan ortalamasındaki ($\bar{x}$=1,317) düşüş anlamlı bulunmamıştır. PANSS Genel Psikopatoloji alt ölçeği puan ortalaması altı aylık takip sonunda ($\bar{x}$=26,418), ilk ay puan ortalamasına ($\bar{x}$=27,136) göre istatistiksel olarak anlamlı derecede düşük bulunmuştur. TRSM'ye kayıtlı olan şizofreni hastalarının altı aylık takibinde kilo alma durumu ile benlik saygısı ve PANSS pozitif/negatif belirtileri arasında anlamlı bir farklılık bulunmamıştır. PANSS genel psikopatoloji belirtilerinde birinci ve altıncı ay ölçümleri arasında anlamlı bir farklılık saptanmıştır. Cinsiyet, gelir getiren işte çalışma durumu, atipik ve karma antipsikotik kullanımı, sigara kullanma durumu ve gündüz uyuma alışkanlığındaki değişikliklerin ruhsal belirtileri etkilediği saptanmıştır.

Anahtar sözcükler: Şizofreni, antipsikotik, kilo alımı, benlik saygısı, ruhsal belirti.

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Introduction

Schizophrenia is a treatable brain disorder that affects 1% of the world's population and is characterized by delusions, apathy, hallucinations, and cognitive inefficiency (Seeman 2016). Weight gain is more common among schizophrenia patients than the general population (Annamalai et al. 2017). It has been reported that approximately 50% of the schizophrenia patients are obese, 40% have metabolic syndrome, 25% have glucose intolerance, and 15% have diabetes (Annamalia 2015). There could be a wide variety of reasons for the increased prevalence of these situations. Weight gain, glucose intolerance, and other metabolic complications are caused by antipsychotics, which are the cornerstone for the treatment of patients with schizophrenia. Metabolic syndrome is 4 times more common in patients with schizophrenia who use atypical antipsychotics than in the healthy population (Demirel et al. 2015). Patients with schizophrenia are known to be unable to consume an adequate and balanced diet (Wang et al. 2020) and engage in sufficient physical activity due to their lower socioeconomic status, lower education level, and non-optimal living conditions (Wang et al. 2020).

Pharmacological treatment of schizophrenia began with the discovery of chlorpromazine in 1952, and with the first-generation antipsychotics (FGAs) and second-generation antipsychotics (SGAs) towards the 2000s, the treatment was sought by focusing on general psychopathology, particularly on the positive symptoms (Cetin 2015). Today, schizophrenia is closely linked to obesity in developed countries, and it is known that obesity rates have increased since the introduction of second-generation antipsychotics in the 1990s. Following the start of antipsychotic treatment, rapid weight gain occurs. Weight gain continues slowly in the following years. In general, the prevalence of overweight and obesity may be two to three times higher than in the general population (Holt 2019). Although most studies in this area have focused on second-generation antipsychotics, weight gain can occur in patients receiving first-generation antipsychotics as well. Weight gain can lead to morbidity and mortality in individuals with mental illnesses. In addition, weight gain may negatively affect self-esteem and lead to more stigmatization of individuals who use antipsychotics (Holt 2019).

According to a large community-based study, overweight and obesity in patients with schizophrenia are more common than in the general population. This is particularly apparent in female patients. While the obesity rate among patients with schizophrenia on medication in Western countries is 40-60%, it is around 30% in the general population (Mermi 2018).

The weight gain status of patients with schizophrenia has been studied in the literature. However, no research has been conducted with these patients in terms of self-esteem and mental symptoms associated with weight gain. The purpose of this study is to examine weight gain status, mental symptoms and self-esteem in schizophrenia patients receiving a treatment at a CMHC. The research questions were created as follows; a) What is the weight-gain status of the patients at the end of the six-month follow-up? b)What are the mental symptoms of the patients at the end of the six-month follow-up? c)What are the factors affecting the mental symptoms of the patients at the end of the six-month follow-up? d)How is the self-esteem of the patients at the end of the six-month follow-up? e)What are the factors influencing the self-esteem of the patients at the end of the six-month follow-up?

Method

Sample

This study's population consists of 400 schizophrenia patients who are being followed in a CMHC. The sample size was calculated with the formula designated by Salant and Dillman (1994). The required sample size for this non-homogeneous population was calculated as n = 400 $(1.96)^2$ (0.1) (0.9) / $(0.5)^2$ (400-1) + $(1.96)^2$ (0.1) (0.9)= 103, with a 95% confidence interval, and ± % 5 sampling error. The study was conducted with 103 patients with schizophrenia, between 01.08.2021 – 01.02.2022. The data was collected by the research team, which included a psychiatrist and a nurse working in Kütahya CMHC. This team was also in charge of planning the patient interviews. CMHC is staffed by a psychiatrist, three nurses, and a psychologist. The institution's practices include psychoeducation, individual interviews, home visits, and social activities for patients and their families. At the beginning of the study, 105 patients who met the research criteria underwent a comprehensive psychiatric examination by the psychiatrist. Two of the patients were excluded from the study because they were hospitalized in the clinic. The study included patients who were diagnosed with schizophrenia according to DSM-5 (The Diagnostic and Statistical Manual of Mental Disorders 5th edition), were literate, and agreed to participate. Patients with severe neurological disease, intellectual disability, or a substance dependence other than tobacco were excluded.

Procedure

The approval of the Non-Invasive Clinical Research Ethics Committee of Kütahya University of Health Sciences (Decision No: 2021/12-06, Date: 08.07.2021), the institution where the study was conducted, and the patients who agreed to participate in the study were obtained in order to conduct the study. The study was conducted in accordance with the Declaration of Helsinki.

At the beginning of the study, patients who met the research criteria underwent a comprehensive psychiatric examination by a psychiatrist. Personal Information Form, which includes patients' sociodemographic characteristics, disease and treatment information, Rosenberg Self-Esteem Scale and PANSS forms were filled by the psychiatric nurse. Each patient was weighed with the same regularly calibrated scale, and their height was measured. At the end of the sixth month, Personal Information Form, Rosenberg Self-Esteem Scale, and PANSS were reapplied and patients' weight was measured. At the end of the study, patients' weight gain status was compared with their mental symptoms and self-esteem.

Measures

Personal Information Form

The form, which was prepared by the researcher by scanning the literature (Holt, 2019, Annamalai et al. 2017, Wang et al 2020), includes information about patients' sociodemographic characteristics, disease and treatment.

Rosenberg Self-Esteem Scale

The scale was developed by Morris Rosenberg in 1965 (Rosenberg 1965). Validity and reliability study for Turkish was conducted by Çuhadaroglu. The first 10 items of the scale, which is made up of 63 questions under 12 subscales, are used to measure self-esteem. Hence, the self-esteem subscale that is in the first "10" items of the scale that measure the self-esteem was used. There are response options for the scale items are: "Strongly agree", "Agree", "Disagree", "Strongly Disagree". If the total score of obtained from 10 items is 1-0, the self-esteem is considered high; if it is 2-4, it is considered medium; and if it is 5-6, it is considered low. The scale's Cronbach's Alpha was 0.89 in Cuhadaroglu's study (Cuhadaroglu 1986), and 0.81 in this study.

Positive and Negative Symptom Scale (PANSS)

This is a semi-structured interview scale, developed by Kay et al. (1987), with 30 items and a seven-point assessment of severity (Kay et al. 1987). Of the 30 psychiatric parameters, seven belongs to positive symptoms subscale, seven belongs to negative symptoms subscale, and 16 belongs to general psychopathology symptoms subscale. Each item includes a seven-point assessment of severity (1: absent, 2: minimal, 3: mild, 4: moderate, 5: moderate severe, 6: severe, 7: extreme). Scoring is done by adding the scores of each item. The score interval of Positive and negative syndrome scale is 7-49, and general psychopathology subscale is 16-112. The total score ranges between 30-210. The Turkish validity and reliability study of the scale was carried out by Kostakoglu et al. (1999). The internal consistency for Turkish version was calculated between 0.71-0.75 (Kostakoglu et al. 1999). The Cronbach alpha internal consistency coefficient for this study was 0.91.

Statistical Analysis

The research data was evaluated in the computer environment via SPSS 22.0 statistical program. Frequency and percentage analysis were used to determine the descriptive characteristics of the participants, and mean and standard deviation statistics were used to analyze the scale. The paired sample t-test was used to examine the difference between the participants' pre-test and post-test scores. The t-test was used to compare quantitative continuous data between two independent groups, and the One-way Anova test was used to compare quantitative continuous data between more than two independent groups. Scheffe test was used as a complementary post-hoc analysis to determine the differences after the Anova test.

Results

35% of the patients are women, 43.7% are single, and 48.5% are between the ages of 45-64. 54.4% are primary school graduates, 89.3% live in the city, and 87.4% do not work in an income-generating job. 79.6% of the patients use atypical antipsychotics, 20.4% use mixed antipsychotics (typical and atypical antipsychotics), and 80.6% had been suffering from a mental illness for more than 11 years. 65% had been hospitalized 1-5 times due to their mental illness (Table 1).

The increase of the patient weights in the sixth month measurement value ($\bar{x}$=81.320) was not found to be significant in comparison to the first month measurement value ($\bar{x}$=81.185) ($p>0.05$). The increase in the body-mass index (BMI) in the sixth month measurement value ($\bar{x}$=29,029) was not found to be significant when compared to the first month measurement value ($\bar{x}$=28.903) ($p>0.05$). The increase in waist circumference in the sixth month measurement value ($\bar{x}$=111.583) was not found to be significant in comparison with the first month measurement value ($\bar{x}$=104.039) ($p>0.05$). The decrease in self-esteem in the sixth month measurement value ($\bar{x}$=1.317) was not found to be significant compared to the first month measurement value ($\bar{x}$=1.452) ($p>0.05$). The decrease in the sixth month measurement value ($\bar{x}$=53.165) was not found to be significant compared to the PANSS total first month measurement value ($\bar{x}$=53.835) ($p>0.05$). The decrease in the positive symptoms in the sixth month measurement value ($\bar{x}$=12.165) was not found to be significant compared to first month measurement value ($\bar{x}$=12.243) ($p>0.05$). The increase in negative symptoms in the sixth month measurement value ($\bar{x}$=14.583) was not found to be significant compared to the first month measurement value ($\bar{x}$ =14.456) ($p>0.05$). The decrease in the general psychopathology in the sixth month measurement value ($\bar{x}$=26.418) was found to be significant compared to first month measurement value ($\bar{x}$ =27.136) ($t=2.790$; $p=0.006<0.05$) (Table 2).

Female patients have a higher PANSS total score in the sixth month ($x=59,528$) than male patients ($x=49.746$) ($t=2.505$; $p=0.027<0.05$; $d=0.518$; $\eta^2=0.058$), and their general psychopathology scores ($x=30.250$) are higher than male patients ($x=24.358$) ($t=3.097$; $p=0.008<0.05$; $d=0.640$; $\eta^2=0.087$) (Table 3).

PANSS total score of patients who do not work in an income-generating job ($x=54.944$) is higher than that of those who do work in an income-generating job ($x=40.846$) ($t=2.516$; $p=0<0.05$; $d=0.746$; $\eta^2=0.059$). Positive symptoms scores are higher in those who do not work in an income-generating job ($x=12.567$) than in those who do ($x=9,385$) ($t=2.036$; $p=0.044<0.05$; $d=0.604$; $\eta^2=0.039$). Negative symptoms scores are higher in those who do not work in an income-generating job ($x=15.189$) than in those who do ($x=10.385$) ($t=2.296$; $p=0<0.05$; $d=0.681$; $\eta^2=0.050$). General psychopathology scores are higher in those who do not work in an income-generating job ($x=27.189$) than in those who do ($x=21.077$) ($t=2.188$; $p=0<0.05$; $d=0.649$; $\eta^2=0.045$) (Table 3).

Table 1. The Distribution of Patients by Descriptive Characteristics		
Characteristics	**Frequency (n)**	**Percentage (%)**
Gender		
Female	36	35.0
Male	67	65.0
Age		
18-29	10	9.7
30-44	43	41.7
45-64	50	48.5
Marital Status		
Single	45	43.7
Married	27	26.2
Separated	29	28.2
Widowed	2	1.9
Educational Status		
Primary School	56	54.4
High School	36	35.0
University	11	10.7
Place of Residence		
Village/Town	9	8.7
County	2	1.9
Province	92	89.3
Occupation		
No	90	87.4
Yes	13	12.6
Income Status		
Sufficient	76	73.8
Insufficient	27	26.2
Physical Illness Status		
No	72	69.9
Yes	31	30.1
Medication Use for Physical Illness		
No	74	71.8
Yes	29	28.2
Medication Use for Mental Illness		
Atypical Antipsychotics	82	79.6
Mixed Antipsychotics	21	20.4
Smoking Status		
No	48	46.6
Yes	55	53.4
Engaged in Diet		
No	101	98.1
Yes	2	1.9

Tablo 1. Devamı		
Characteristics	**Frequency (n)**	**Percentage (%)**
Mental Illness Duration		
1-5 Years	6	5.8
6-10 Years	14	13.6
11 Years and more	83	80.6
Hospitalization due to Mental Illness		
Never	12	11.7
1-5 Times	67	65.0
6-10 Times	10	9.7
11 Times and more	14	13.6
Existence of a Fat Person in the Family		
No	62	60.2
Yes	41	39.8
Exercising Status		
No	93	90.3
Yes	10	9.7
Period of Inactivity During the Day		
1-5 Hours	39	37.9
6-10 Hours	60	58.3
11 Hours and more	4	3.9
Daytime Sleeping Habit		
No	66	64.1
Yes	37	35.9
Presence of Assigned Guardian		
No	57	55.3
Yes	46	44.7
Descriptive Statistics: Frequency (n), percentage (%)		

Patients who use atypical antipsychotics (x=51.268) have a lower PANSS total score than those who use mixed antipsychotics (x=60.571) (t=-1.992; p=0.049<0.05; d=0.487; η^2=0.038). Patients who use atypical antipsychotics (x=25.293) have lower general psychopathology scores than those who use mixed antipsychotics (x=30.810) (t=-2.408; p=0.018<0.05; d=0.589; η^2=0.054) (Table 3).

General psychopathology scores of patients who do not smoke (x=28.438) is higher than the score of the patients who do smoke (x=24.655) (t=2.028; p=0.045<0.05; d=0.401; η^2=0.039) (Table 3).

The PANSS total score of patients who do not have a daytime sleeping habit (x=49.667) is lower than that of those who do (x=59.405) (t=-2.510; p=0.014<0.05; d=0.516; η^2=0.059). Negative symptom scores of patients who do not have a daytime sleeping habit (x=13.394) is lower than that of those who do (x=16.703) (t=-2.284; p=0.039<0.05; d=0.469; η^2=0.049). General psychopathology scores of patients who do not have a daytime sleeping habit (x=24.879) is lower than that of those who do (x=29.162) (t=-2.217; p=0.029<0.05; d=0.455; η^2=0.046) (Table 3).

Table 2. The difference between the first and the sixth month measurement values

Measurements	First Month		Sixth Month		N	t	p
	Mn	Sd	Mn	Sd			
Height	166.942	11.209	166.942	11.209	103	-	-
Weight	81.185	15.857	81.320	16.077	103	-0.364	0.717
BMI	28.903	5.865	29.029	5.978	103	-0.858	0.393
Waist Circumference	104.039	12.093	111.583	71.756	103	-1.046	0.298
Self-Esteem	1.452	0.859	1.317	0.693	103	1.965	0.052
Panss Total	53.835	19.419	53.165	19.376	103	1.337	0.184
Positive Symptoms	12.243	5.279	12.165	5.347	103	0.377	0.707
Negative Symptoms	14.456	7.025	14.583	7.200	103	-0.590	0.557
General Psychopathology	27.136	9.836	26.418	9.586	103	2.790	0.006

t: Unpaired T-test

Discussion

In this study, which was conducted on patients with schizophrenia in a CMHC of a Training and Research Hospital in Turkey, there was no significant difference in the patients' weight, waist circumference, body mass index (BMI) and self-esteem and positive/negative symptoms at the end of the six-month follow-up compared to the first month. It is detected that gender, income-generating job status, atypical and mixed antipsychotic use, smoking status and changes in the daytime sleeping habits affect the mean score of PANSS.

Atypical or mixed antipsychotics are commonly used in treatment of the patients with schizophrenia who are registered to CMHC. It is seen that patients who were followed for six months had an increase in their weight measurement at the end of the sixth month. However, in this study, the use of antipsychotics had no effect on the weight gain in individuals. Another study that support this study discovered no significant relationship between antipsychotic drug use and mean BMI score (Vergi, 2019). In a separate study, the incidence of weight and obesity in patients who use antipsychotics is examined, and patients' body mass index is recorded in the first and 12th months. The study's findings were found to be similarly insignificant (Cerit et al. 2006). Various studies have stated that the majority of the psychiatric medications cause weight gain (Schwartz et al. 2004). Similarly, Kurtzthaler and Fleschacker (2001) mentioned in their study that most second-generation antipsychotics cause more weight gain than traditional neuroleptics (Kurtzthaler and Fleschacker 2001). While antipsychotic medication can be effective in treating psychopathologic symptoms, the side effects can cause weight gain (Eraslan et al. 2006, Meltzer et al. 2003). On the other hand, when other sources in the literature are examined, it is seen that weight changes in individuals diagnosed with psychotic disorder began prior to the use of antipsychotic medication (Mermi 2018). In this case, the current weight gain in individuals is not only due to the use of antipsychotics, but also due to factors such as sedentary life, hospitalization, desire to be personally strong, low motivation or negative symptoms of schizophrenia that can prevent physical activity such as apathy and anhedonia (Vergi 2009, Every-Palmer et al. 2018). The participants in this study are known to not engage in any physical activities other than those provided by CMHC, to which they regularly attend. This could also explain why the study's results were not significant.

Self-esteem in another factor examined in the study. There was no significant relationship detected between the first and sixth month mean scores on the self-esteem scale. According to the results of Vergi's (2019) study, the mean weight of individuals diagnosed with schizophrenia ranged between 28.17±3.99 kg/m^2. In regard to these data, there is a weak positive correlation between self-esteem and BMI (Vergi 2019). As for this study, the first month BMI measurement value was 28.903 and the sixth month measurement value was 29.029. When the BMI is categorized, the current mean falls into the over-weight group rather than the obese group. The fact that there is no significant relationship between BMI and self-esteem, could be attributed to patients' current mean weight. According to a study on body weight and self-esteem in patients with schizophrenia, patients who have recently gained weight have lower self-esteem (De Hert et al. 2006). A study conducted by Oh et al. discovered that body mass index and body image have an effect on the self-esteem of patients with schizophrenia (Oh et al. 2017).

As a result of the PANSS first and second mean scores, the decrease in the general psychopathology mean score was found to be significant. According to a study conducted with patients diagnosed with schizophrenia spectrum disorder, there is a significant relationship between weight gain and recovery (In general psychopathology, positive and negative symptoms subscales of PANSS) (Garcia-Rizo 2020). In a sample of 94 patients treated with olanzapine or ziprasidone for 6 months, early weight gain was found to be associated with less improvement in overall function (Agid et al. 2013). It is observed that gender affects the total PANSS score and the mean score of general psychopathology. Female participants have a higher mean score than male participants. Another study found that male participants showcase more negative symptoms and less positive symptoms than female participants (Wei et al. 2020).

Table 3. Differentiation of PANSS and Self-Esteem Scale scores according to descriptive characteristics at the end of six months

Demographic Characteristics	n	Self-Esteem Post-Test	Panss Total Post-Test	Positive Symptoms Post-Test	Negative Symptoms Post-Test	General Psychopathology Post-Test
Gender		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Female	36	1.331±0.689	59.528±22.773	12.667±5.611	16.611±8.939	30.250±11.502
Male	67	1.309±0.701	49.746±16.469	11.896±5.223	13.493±5.855	24.358±7.716
t=		0.153	2.505	0.696	2.132	3.097
p=		0.879	0.027	0.488	0.065	0.008
Age		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
18-29	10	1.040±0.422	62.700±24.572	15.200±7.927	17.400±6.687	30.100±12.224
30-44	43	1.335±0.739	55.535±21.232	12.721±5.535	15.581±8.160	27.233±10.974
45-64	50	1.356±0.695	49.220±15.647	11.080±4.285	13.160±6.169	24.980±7.427
F=		0.890	2.652	2.985	2.207	1.469
p=		0.414	0.075	0.055	0.115	0.235
Marital Status		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Single	45	1.412±0.719	54.156±20.967	12.489±6.029	14.511±7.316	27.156±10.747
Married	27	1.140±0.618	52.852±19.331	12.111±5.487	14.741±6.970	26.000±9.034
Separated	31	1.331±0.709	52.000±17.459	11.742±4.179	14.548±7.456	25.710±8.415
F=		1.315	0.116	0.178	0.009	0.240
p=		0.273	0.890	0.837	0.991	0.787
Educational Status		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Primary School	56	1.270±0.652	55.875±18.979	13.000±5.487	15.911±7.217	26.964±9.446
High School	36	1.371±0.737	49.944±20.757	11.528±5.180	13.056±7.552	25.361±10.291
University	11	1.376±0.799	49.909±15.814	10.000±4.648	12.818±4.579	27.091±8.348
F=		0.272	1.205	1.872	2.140	0.332
p=		0.762	0.304	0.159	0.123	0.718
Place of Residence		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
Province	92	1.307±0.711	52.544±19.253	12.000±5.388	14.315±7.191	26.228±9.439
Other	11	1.399±0.542	58.364±20.559	13.546±5.007	16.818±7.209	28.000±11.109
t=		-0.416	-0.941	-0.905	-1.091	-0.577
p=		0.678	0.349	0.368	0.278	0.565
Occupation		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
No	90	1.327±0.684	54.944±19.928	12.567±5.451	15.189±7.444	27.189±9.944
Yes	13	1.243±0.783	40.846±7.592	9.385±3.618	10.385±2.785	21.077±3.523
t=		0.407	2.516	2.036	2.296	2.188
p=		0.685	0.000	0.044	0.000	0.000
Income Status		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Sufficient	76	1.317±0.671	51.790±18.685	11.684±4.900	14.487±7.362	25.618±9.013
Insufficient	27	1.316±0.765	57.037±21.085	13.519±6.351	14.852±6.848	28.667±10.912
t=		0.005	-1.212	-1.542	-0.225	-1.426
p=		0.996	0.228	0.126	0.822	0.157

Tablo 3. Continued

Demographic Characteristics	n	Self-Esteem Post-Test	Panss Total Post-Test	Positive Symptoms Post-Test	Negative Symptoms Post-Test	General Psychopathology Post-Test
Physical Illness Status		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
No	72	1.247±0.630	52.903±18.556	12.194±5.314	14.681±7.019	26.028±9.060
Yes	31	1.479±0.810	53.774±21.469	12.097±5.510	14.355±7.718	27.323±10.815
t=		-1.569	-0.208	0.085	0.210	-0.627
p=		0.120	0.835	0.933	0.834	0.532
Medication Use for Physical Illness		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
No	74	1.275±0.645	52.649±18.366	12.149±5.254	14.541±6.978	25.960±8.948
Yes	29	1.423±0.807	54.483±22.037	12.207±5.672	14.690±7.865	27.586±11.137
t=		-0.973	-0.430	-0.049	-0.094	-0.773
p=		0.333	0.668	0.961	0.925	0.486
Medication Use for Mental Illness		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Atypical Antipsychotics	82	1.346±0.713	51.268±19.031	11.817±5.275	14.159±7.074	25.293±8.952
Mixed Antipsychotics	21	1.201±0.614	60.571±19.377	13.524±5.537	16.238±7.622	30.810±10.893
t=		0.858	-1.992	-1.310	-1.183	-2.408
p=		0.393	0.049	0.193	0.239	0.018
Smoking Status		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
No	48	1.264±0.693	56.458±21.741	12.313±5.828	15.708±8.098	28.438±10.162
Yes	55	1.363±0.696	50.291±16.723	12.036±4.940	13.600±6.223	24.655±8.769
t=		-0.723	1.624	0.260	1.491	2.028
p=		0.472	0.107	0.795	0.139	0.045
Mental Illness Duration		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
10 Years and Less	20	1.220±0.703	49.850±16.512	11.050±4.383	13.650±5.932	25.150±8.299
11 Years and More	83	1.340±0.693	53.964±20.012	12.434±5.544	14.807±7.487	26.723±9.892
t=		-0.695	-0.851	-1.039	-0.643	-0.657
p=		0.488	0.397	0.301	0.521	0.513
Hospitalization due to Mental Illness		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
Never	12	1.317±0.636	45.667±8.553	10.167±2.082	13.000±5.908	22.500±3.656
1-5 Times	67	1.256±0.635	55.134±21.132	12.343±5.688	15.448±7.857	27.343±10.180
6-10 Times	10	1.874±0.797	51.000±16.653	12.100±5.131	12.500±3.629	26.400±12.131

Tablo 3. Continued

Demographic Characteristics	n	Self-Esteem Post-Test	Panss Total Post-Test	Positive Symptoms Post-Test	Negative Symptoms Post-Test	General Psychopathology Post-Test
11 Times and More	14	1.206±0.820	51.714±18.619	13.071±5.784	13.286±6.580	25.357±7.870
F=		2.553	0.895	0.712	0.945	0.932
p=		0.060	0.447	0.547	0.422	0.428
Existence of a Fat Person in the Family		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
No	62	1.329±0.670	54.000±20.452	12.436±5.545	15.000±7.544	26.565±10.060
Yes	41	1.298±0.735	51.902±17.796	11.756±5.073	13.951±6.686	26.195±8.939
t=		0.216	0.536	0.629	0.722	0.191
p=		0.830	0.593	0.531	0.472	0.849
Exercising Status		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
No	93	1.314±0.690	53.022±19.906	12.290±5.500	14.473±7.363	26.258±9.769
Yes	10	1.341±0.766	54.500±14.207	11.000±3.621	15.600±5.661	27.900±7.951
t=		-0.117	-0.228	0.723	-0.469	-0.513
p=		0.907	0.820	0.471	0.640	0.609
Period of Inactivity During the Day		Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD	Mn ± SD
1-5 Hours	39	1.398±0.756	53.333±21.003	11.872±5.718	14.590±6.600	26.872±10.258
5 Hours and more	64	1.267±0.654	53.063±18.485	12.344±5.146	14.578±7.592	26.141±9.225
t=		0.933	0.068	-0.433	0.008	0.374
p=		0.353	0.946	0.666	0.994	0.709
Daytime Sleeping Habit		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
No	66	1.369±0.705	49.667±16.582	11.394±4.647	13.394±6.258	24.879±8.546
Yes	37	1.223±0.671	59.405±22.467	13.541±6.243	16.703±8.303	29.162±10.790
t=		1.022	-2.510	-1.983	-2.284	-2.217
p=		0.309	0.014	0.073	0.039	0.029
Presence of an Assigned Guardian		Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS	Ort ± SS
No	57	1.362±0.671	51.474±20.136	12.105±5.924	13.983±6.932	25.386±9.669
Yes	46	1.260±0.723	55.261±18.391	12.239±4.596	15.326±7.528	27.696±9.430
t=		0.736	-0.986	-0.126	-0.941	-1.219
p=		0.464	0.326	0.900	0.349	0.226

F: Anova Test; t: Unpaired t-test; PostHoc:Tukey. LSD

Income-generating job status influences PANSS positive, negative, general psychopathology and total mean score. Individuals who do not have an income-generating job have a higher score than those who do.

Differences in the use of atypical and mixed antipsychotics affects PANSS total and general psychopathology mean scores. Individuals who use mixed antipsychotics have higher scores than individuals who use atypical antipsychotics. Atypical antipsychotics have a broader treatment efficacy on positive, negative, mood symptoms, and basic psychopathologies, compared to typical antipsychotics. Inclusion of typical antipsychotics in the treatment process increases extrapyramidal side effects in the long run (Meltzer and Gadaleta 2021). Mixed antipsychotics may be associated with higher PANSS scores because they contain typical antipsychotics.

Smoking status of individuals affects their PANSS general psychopathology mean score. Participants who did not smoke scored significantly higher than those who did. Patients with schizophrenia have a higher smoking rate than those with other psychiatric disorders (Zhang et al. 2012). The results of studies on the relationship between nicotine addiction and schizophrenia symptoms differ from each other. While some of the study results state that smoking and nicotine can compensate some deficiencies in cognitive functions, another study states that mild smokers have a lower PANSS total score than heavy smokers and non-smokers (Zhang et al. 2012, Aguilar et al. 2005). Another study found that individuals with severe nicotine addiction have higher PANSS positive subscale score, while those with mild to moderate addiction have higher PANSS negative subscale scores (Krishnadas et al. 2012).

The differences in daytime sleeping habits affect PANSS negative, overall and total mean scores. Individuals with a daytime sleeping habit have higher scores. Sleep disorders, which are common in patients with schizophrenia, affect the cognitive functions of individuals. Hence, psychotic behaviors may become more prevalent in people who have a sleep disorder. Circadian rhythm disorder, which is one of the sleep disorders, causes the sleep period to be delayed according to the desired sleeping and waking time (Reeve et al. 2019). Therefore, the individual who wants to stay awake during the day, spends this time in a sleepy state. A study on this subject associated the circadian rhythm disorder with not having a job and a daily schedule (Kaskie et al. 2017). As another influencing factor, the PANSS mean scores of individuals working in income-generating jobs were found to be lower. It can be justified that having a daily plan and a job affects PANSS mean scores. Dopaminergic overactivity in schizophrenia patients is also thought to explain the relationship between schizophrenia and insomnia (Robertson et al. 2019). Therefore, disruptions in drug use may be an obstacle to maintaining night sleep.

For future studies examining weight gain in patients with schizophrenia, it may be recommended that patients with and without weight gain be treated separately and followed for a longer period of time. This study has a couple of limitations. First, this study was a cross-sectional study, preventing causality results. More kohort studies are needed to determine the relationship between weight gain, mental symptoms, and self-esteem. Second, sample size was rather small, and our results need to be enhanced and extended to a larger population.

Conclusion

In this study, which was conducted on patients with schizophrenia in a CMHC, there was no significant difference in the patients' weight, waist circumference, body mass index (BMI) and self-esteem and positive/negative symptoms at the end of the six-month follow-up compared to the first month. On the other hand, a significant difference was detected between the first- and sixth-month measurements of general psychopathology symptoms of Positive and Negative Syndrome Scale (PANSS). When the influencing factors are analyzed, it is discovered that gender, income-generating job status, atypical and mixed antipsychotic use, smoking status, and changes in daytime sleeping habits all have an effect on PANSS mean scores.

Avoiding multiple medication use, encouraging healthy diet and physical activity, dealing with sleeping problems, and regular weight monitoring will be effective in the fight against patients' weight gain. The interventions must to be developed to prevent weight gain in individuals with schizophrenia and to support the reduction of health inequalities.

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