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Effect of Antipsychotic Drugs on Body Composition in Patients Attending Psychiatry Clinic, Jimma, Ethiopia

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Abstract

Despite their irrevocability in the therapeutics of mental illness, an antipsychotic drug has many side effects including change in the body composition. More specifically, atypical antipsychotics, such as, Olanazapin, were often associated with increased weight gain compared to conventional antipsychotics, risking patients to metabolic syndrome. Generally, there is lack of study concerning effects of antipsychotic drugs on body composition in low income setting. The aim of this study was to assess changes in body composition among psychiatric patients taking antipsychotic drugs.

A longitudinal study was conducted among 74 clients attending psychiatric clinic at Jimma university specialized hospital. A consecutive sampling method was applied. Body weight, height, waist and hip circumferences and skin fold thickness were measured before and after 12 weeks of therapy. A structured questionnaire was used to assess socio-demographic and socio-economic factors. The data were analysed using SPSS Version 20 for Windows. One way ANOVA, paired t-test, and independent t-test were applied to examine mean change in body composition indicators across the variables.

The mean ± SD of body weight, Body mass index, waist to hip ratio, Percent body fat of patients taking antipsychotic drugs were significantly higher by 4.16 kg ± 2.78, 1.54 kg/m^2 ± 1.08, 1.27 ± 0.781 and 0.02 ± 1.08 respectively. Increment of body composition was not even among different types of drugs used. The mean change in weight for Risperidone, Haloperidol, and Chlorpromazine were 4.3, 3.4, 5.4 kg, respectively. The increase in body composition observed in this study was irrespective of socio-demographic and behavioral characteristics of the patients.

Significant increment in body weight, BMI, waist to hip ratio and percent body fat was observed among psychotic patients who took Risperidone, Haloperidol, and Chlorpromazine. Efforts to mitigate the untoward effects of these drugs should begin early before evident metabolic risk profile changes become evident.

Keywords: Antipsychotic drugs; Body composition; Body mass index; Waist to hip ratio

Abbreviations: BF: Body Fat; DSM: Diagnostic and Statistical Manual of Mental disorders; JUSH: Jimma University Specialized Hospital; SFT: Skin Fold Thickness; WHR: Waist to Hip Ratio

Introduction

Psychotic disorders are mainly chronic disabling mental illnesses that affect millions of people worldwide [1]. Antipsychotic medications, which comprise one of the most widely prescribed medications, have proven effective in many psychiatric conditions. However, weight gain is a major side- effect of antipsychotic drug treatment, contributing to morbidity and poor adherence to treatment [2]. The observed weight gain with several atypical antipsychotics is often greater than that reported with conventional antipsychotics [3]. Several of the newer atypical antipsychotic agents have profound effects on weight, the greatest increases occurring with Clozapine and Olanzapine [4]. However, no antipsychotic agent should be considered entirely body-weight-neutral, as the proportion of individuals who experience clinically relevant weight gain (defined as ≥ 7% of pretreatment body weight) is greater with any antipsychotic agent than with placebo [3,5]. Moreover, all antipsychotic drugs can cause notable weight gain in patients who are taking these agents for the first time [6].

Obesity is well known to be associated with adverse medical outcomes and poor quality of life, as well as depression, low self-esteem, and medication non adherence; Moreover Obesity and weight gain have been associated with hypertension, type II diabetes, coronary heart disease, and stroke [7]. These effects could be devastating in patients with psychosis who are receiving treatment with an antipsychotic for long duration. Weight gain may also cause patients taking antipsychotic medications to discontinue their medications, which may predispose them to relapse and worsened long- term outcome [8,9].

Antipsychotic drugs fall into two major groups: first generation antipsychotics and second generation antipsychotics [10,11]. Most of the newer atypical agents appear to exert part of their unique action through inhibition of serotonin receptors (5HT), particularly 5-HT2A receptors [12]. Serotonin and its receptors, (5-HT2a and 5-HT2c), have a major role in the control of food intake and body weight [13,14]. Antipsychotics also act on Histamine (H1) receptors that induce weight gain. Blockade of the dopamine D2 and D3 receptors is another potential mechanism involved in antipsychotic-drug-induced weight

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gain. It is generally believed that there are multiple mechanisms by which antipsychotic drugs induce weight gain, but their precise nature remains unknown. Moreover, synergistic effects between the blockade of D2 receptors and 5-HT2a or 5-HT2c receptors might have a key role in triggering a cascade of events that lead to increased energy intake and weight gain [15].

Clinical trials of the efficacy and safety of the atypical antipsychotics show weight gain in 50%–80% of subjects, ranging from a few kilograms to amounts that exceed 20% of baseline weight [16]. In another study it is observed that after approximately 12 weeks of olanzapine therapy, the median increase in body weight was 4.7 kg, a significant increase of 7.3% from first observation [4]. In a similar study done in China, patients were treated for 10 week with risparidone and clozapine, there was a significant increase in both weight and fat indicators (mean weight 4.46 kg, BMI 1.69, WHR, 0.04) [15]. Another study also showed in a 12-month trial involving patients with a first episode of schizophrenia who were treated with antipsychotic drugs such as amisulpride, ziprasidone and haloperidol, each drug was associated with a notable weight gain (9.7 kg, 4.8 kg and 6.3 kg, respectively) by the end of the study [17].

Globally, mental disorders represent 4 of the 10 leading causes of disability worldwide. It account for 12% of the global burden of disease [18]. Around 450 million people suffer from a mental or behavioural disorder [19]; of whom 1.1% (25 million) suffers from schizophrenia. It was long believed that the prevalence of psychotic disorder is attributed to developed country but rapid urbanization, industrialization, migration, conflict and ongoing poverty and deprivation characterize most of sub-Saharan Africa in recent decades; and it is likely that these potent risk factors for psychosis have contributed to shifts in the social epidemiology of psychosis and schizophrenia in Africa [20].

In Ethiopia, mental illness is the leading non-communicable disorder in terms of burden. Remarkably, in rural setting of the country, mental illness comprised 11% of the total burden of disease; schizophrenia (0.5%), depression (5%), and bipolar disorder (5%) included in the top ten most burdensome mental conditions [21]. Therefore, the aim of this study was to assess the effect of antipsychotic drugs taken by these patients on their body composition and its associated factors in low-income settings.

Methods

Study design and setting

This study was conducted at Jimma University Specialized Hospital (JUSH) from 01 March to July 30, 2016; using an institution based longitudinal before and after study design. JUSH is located in Jimma city 352 km Southwest of Addis Ababa. JUSH provides psychiatric care services, psychiatric treatment and rehabilitation (under ways). The psychiatric clinic provides outpatient and inpatient services for about 10,560 patients per year in: general adult psychiatry, geriatric psychiatry, child psychiatry and addiction psychiatry.

Sample size and sapling technique

The sample size was determined by using Epi-info Version 7.0 program at the power of 80% to determine the intended change of body composition among psychotic patients after treatment for 12 weeks. Accordingly, the calculation yielded a sample size of 68 subjects. By considering 10% non-response rate, a sample of 74 patients admitted to the psychiatric clinic was included in the study.

Patients who were diagnosed for first episode of psychosis using DSM-V criteria and start antipsychotic drug treatment were recruited successively during the first two months of the study period until the required sample size was obtained. Patients who were previously treated with antipsychotic drugs as well as patient with concomitant chronic medical illnesses were excluded from the study.

Data collection procedures

Structured interviewer administered questionnaire that consists of description on socio-demographic as well as socio-economic characteristics of the patient that are associated with the development of body composition change was developed. Four psychiatric Nurses were recruited, trained and collected the required data.

Before starting data collection process four psychiatric Nurses were recruited trained and collected the required data. Data collectors were given a 2 days training on the objective, relevance of the study, and confidentiality of information as well as to be familiar with data collection tool, measurement procedure and technique. Ethical clearance was obtained from institutional review board of College of Health Science, Jimma University. Verbal consent from study participant and caretaker was also obtained.

Measurements

Balanced-beam scale, stadiometer, measuring tape, and skin fold calliper were used to measure weight, height, waist and hip circumferences and skin fold thickness (SFT). Body mass index (BMI) and waist to hip ratio (WHR) were calculated using WHO Anthro-Plus software for all patients on admission and after 12 weeks of antipsychotic drug treatment. Weight (to the nearest 0.1 kg) was measured with balanced beam scale with patient wearing light cloth and shoes off and height (to the nearest 0.1 cm) was measured with a wall-mounted stadiometer. BMI was derived from weight (in kg) and height (in m^2). Waist circumference was measured midway between the lower rib margin and the iliac crest, and hip circumference was measured at the level of the widest circumference to the nearest 0.5 cm. Skin fold thickness was measured at three sites (Triceps, abdominal, scapular) using callipers. Percent body fat was calculated from skin fold thickness measurements result using body fat calculator software.

Data processing and analysis

Data was checked for consistency, cleaned and coded and entered in to Epi-Data version 3.1 and were exported to SPSS version 20. Continuous variables were expressed as mean and standard deviation while, categorical variables were expressed as frequencies and percentage. Paired sample t-test, Independent sample t-test and one way ANOVA test were used to assess the statistical significance of the mean difference between two and more than two categories respectively. A significance level of $p<0.05$ was used in all tests. BMI and percent body fat were calculated using software WHO Anthro-Plus software and body fat calculator.

Results

Socio-demographic characteristics of respondents

A total of 74 psychotic patients were participated in present study. Among the respondents 43(58.1%) were males and 31(41.9%) were females. The mean (SD) ages of the respondents were 25.1 ± 7.23 years. More than half 43(58.1%) of the patients were from the rural part of Jimma Zone and the rest 31(41.9) were from the urban. Out of 74 study participants 32(43.2%), were singles and 24(32.4%), 15(20.3%), 3(4.1%) were married, divorced and widowed respectively. Regarding their

educational status, 37(50%) attended primary school (grade 1-8) while 18(24.4%) attended secondary school, the rest 15(20.3%) and 4(5.4%) have no formal education and higher education, respectively.

Change in body composition indicators

The initial base line measurement of the respondent's body weight was 55.76 kg ± SD 6.95, Height 167.23 cm ± SD, BMI 19.97 kg/m^2 ± SD 2.34, Waist 75.24 cm ± SD 7.35, Hip 87.75 cm ± SD 6.4, WHR 85.69 ± SD 5.56), and percent body fat (%BF) was 9.73 ± SD 4.97. There were no significant differences between male and female patients at base line measurements in body composition indicators ($p>0.05$).

Second measurement was done 12 weeks after the treatment with antipsychotic drugs and the result shows the value of mean weight 59.76 kg ± SD 7.03, which was increased by 7.46% of their initial weight, BMI 21.4 kg/m^2 ± SD 2.57, WHR 87.23 ± SD 5.25 (2.35% of the base line increment) and percent body fat 10.86 ± SD 5.26) (13.1% of the base line increment).

There were significant increases in all weight and fat indicators after 12 weeks antipsychotic treatment in the patients with mean increase in weight 4.16 kg (±SD 2.78), ($p<0.001$), BMI 1.54 kg/m^2 (±SD 1.08) ($p<0.001$), percent body fat 1.27(±SD 0.781) ($p<0.001$), and for WHR 0.02(±SD 1.08) ($p<0.01$) (Table 1).

Independent t-test result shows a significant association between changes in body composition indicators and sex of the patients ($p<0.05$) except for WHR ($p>0.05$). There was no significant association observed between other socio-demographic variables and body composition indicators in both ANOVA and independent t-test (Table 2).

Behavioural characteristics and meal source of the respondents

Out of the total study participants 27(36.5%) were khat chewers and 11(14.9%) were cigarette smokers and 9(12.2%) were alcohol drinkers. Among khat chewer 16 (59.3%) were daily chewer while 11(40.7%) chew one or more time per week. When we see the respondents habit for different types of substance use 17(36.17%) were use all khat, alcohol, and cigarette, while 10(21.27%) were users of khat and cigarette only and the rest 7(14.89%) were taking khat and alcohol only. Majority of the patient 41(55.4%) get their meal from their relatives as well as from the hospital; while for 26(35.1%) patients get their meal only from the hospital. Seven (9.5%) get their meal only from their relative. None of study participants had regular physical activity.

A one way ANOVA results showed there were a significant differences exist between sources of food and change in weight $F=5.8$ ($p=0.05$) and change in BMI $F=5.8$ ($p=0.004$) (Table 3).

Diagnosis and treatment of the study participants

Out of the total 74 respondents, 53(71.62%) were diagnosed for schizophrenia, while 21 (28.4%) were diagnosed for bipolar disorders. Among the study participants 55(74.3%) had no previous personal and family history of medical and psychiatric illnesses, while 19(25.7%) had family history of psychiatric illness. The diagnosis was made using DSM-V diagnostic criteria. Independent t-test showed no statistically significant difference between change on body composition indicators and diagnosis of the patient's ($p>0.05$).

Among the respondents, 27(36.5%) were prescribed with Risperidone followed by 17(23%), 4(5.4%) patients were treated with Haloperidol, and chlorpromazine respectively as single drug therapy. Fifteen (20.3%), 7(9.5%) were treated by combining Risperidone with Amitriptyline and sodiumvalporate, respectively. The rest 4(5.4%) were given combined Haloperidol with sodiumvalporate.

Individual antipsychotic drugs were consistently associated with different degrees of weight gain. Change in body composition was observed with a mean increase in weight with Chlorpromazine 5.43 kg, Risperidone 4.3 kg, and Haloperidol 3.4 kg. A one way ANOVA test was done and no significant difference in mean alteration of body composition indicators across treatment were observed ($p>0.05$) (Table 4).

Discussion

Body composition changes appear to be a multi-factorial phenomenon resulting from interactions with drugs and different neurotransmitters in the brain, patient characteristics, and other as yet unidentified factors [4-6]. These concerns primarily include metabolic side effects, consisting of excessive weight gain, abnormal glucose regulation and dyslipidemia, as well as their consequent morbidity.

The present investigation showed a significant change in body composition indicators from baseline measurements following treatment with diverse antipsychotic drugs including Chlorpromazine, Risperidone and Haloperidol. A significant increase in BMI, waist hip ratio and percent body fat were observed after 12 weeks antipsychotic drug treatment among patients. A significant mean increase in weight, 4.16 kg, (7.46%) of the initial base line measurement observed; this is clinically relevant weight gain defined as ≥ 7% of pre-treatment body weight [5]. Likewise, BMI 1.54 kg/m^2, percent body fat 1.27 and WHR 0.02 increment after treatment were statistically significant. The mean BMI after treatment was 21.4 kg/m^2 that fall into WHO normal range that is 20-24 kg/m^2 [22].

Even though the patients mean BMI is within normal range, the long term medication can result in over weight and obesity. The present study result is in agreement with a study conducted by Tarricone and colleagues in antipsychotics naive patients who were prescribed antipsychotic drugs, for different length of exposures for (4–8, 10–12 and 24–48 weeks). Their result showed that long term use of antipsychotics was associated with more weight gain and increase in BMI compared with short term use [6]. Several factors explain weight gain due to antipsychotics and the impact of duration of antipsychotics use on bodyweight. Antipsychotics medication induces changes in appetite and food intake, most likely because of the interaction with serotonergic, histaminergic and dopaminergic neurotransmitter systems inducing increase in appetite and food intake [23,24]. Therefore, their effects on weight and Body Mass Index (BMI) likely will progress with time.

An increase in percent body fat calculated from SFT at three sites (triceps, sub-scapular, and abdominal) also showed an increase in subcutaneous fat. In present study the mean WHR of female patients after treatment were 0.86. Furthermore, the increase in the waist to- hip ratio in excess of 0.85 in female suggests a central fat deposition, a pattern associated with adverse metabolic consequences [25]. The most likely explanation for the fat gain is that subjects maintained positive energy balance and deposited this energy in the form of triglyceride in adipose tissue. Decreased fatty acid oxidation has been associated with weight gain [26]. One study reported that in a study of Pima Indians, high respiratory quotient/low fatty acid oxidation was a predictor of weight gain over the long-term treatment of antipsychotics [27]. Furthermore, the present study showed that women had more weight gain than men. This finding is in agreement with studies done by other researchers Seeman et al. in which women who were prescribed antipsychotics

Patient group		Weight (kg)Mean (±SD)	BMI (kg/m²)Mean (±SD)	Waist (cm) Mean (±SD)	WHRMean (±SD)	%BFMean (±SD)
All patients N=74	Before treatment	55.76(6.94)	19.97(2.24)	75.24(7.34)	0.85(5.36)	9.73(4.97)
	After Treatment	59.76(7.03)	21.41(2.57)	77.01(7.12)	0.87(5.25)	11(5.26)
	Change P**	4.16(2.78)0.000	1.54(1.08)0.000	1.77(1.44)0.000	0.02(1.08)0.000	1.27(0.781)0.000

Note: Paired t- test, **significant at p<0.001

Table 1: Paired t-test for body composition indicators before and after treatment in patient taking antipsychotic drugs in JUSH, July, 2016.

Variables		Weight	BMI	WHR	%BF
	n=74(%)	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Sex					
Male Female P*	43(58.1) 31(41.9)	3.89(2.11) 4.53(3.51) 0.040	1.34(0.70) 1.81(1.42) 0.004	1.48(1.52) 1.60(1.69) 0.769	1.17(0.87) 1.42(0.62) 0.030
Age					
15-24 25-34 >35 P**	31(41.9) 28(37.8) 15(20.3)	4.10(3.15) 4.38(2.35) 3.88(2.59) 0.854	1.60(1.29) 1.53(0.93) 1.43(0.92) 0.878	1.48(1.33) 1.57(1.75) 1.55(1.85) 0.975	1.24(0.74) 1.44(0.81) 1.10(0.80) 0.285
Residency					
Rural Urban P*	43(58.1) 31(41.9)	4.45(2.88) 3.73(2.63) 0.324	1.62(1.00) 1.44(1.18) 0.853	1.54(1.29) 1.51(1.93) 0.064	1.45(0.84) 1.03(0.63) 0.076
Marital status					
Single Married Divorced Widowed P**	32(43.2) 24(32.4) 15(20.0) 3 (4.40)	4.50(3.41) 4.24(2.38) 3.69(1.94) 2.33(1.76) 0.141	1.70(1.33) 1.46(0.85) 1.46(0.88) 0.88(0.63) 0.570	1.31(1.38) 1.69(1.84) 1.78(1.75) 1.48(0.15) 0.747	1.33(0.78) 1.21(0.78) 1.33(0.84) 0.48(0.27) 0.286
Educational status					
Primary school Secondary school No formal education Higher education P**	15(20.3) 37(50.4) 18(24.4) 4 (5.4)	4.15(2.61) 4.10(2.56) 4.52(3.43) 3.15(3.08) 0.844	1.52(0.78) 1.51(0.96) 1.69(1.46) 1.23(1.46) 0.869	1.76(1.05) 1.79(1.79) 1.18(1.63) 0.74(0.18) 0.459	1.38(0.79) 1.35(0.80) 1.15(0.76) 0.81(0.58) 0.482
Average monthly income					
<400 birr 401-1000 birr >1000 birr P**	42(56.8) 22(29.7) 10(13.5)	4.12 (2.79) 4.39(3.24) 4.10(2.78) 0.858	1.50(1.03) 1.66(1.36) 1.44(0.51) 0.818	1.45(1.45) 1.56(1.51) 1.55(1.49) 0.558	1.36(0.82) 1.18(0.68) 1.09(0.81) 0.478

Note: *-independent t-test, **- one way ANOVA # other (Tigre, Silte) test at p<0.05

Table 2: Association between socio-demographic variables and the mean changes in body composition indicators, among psychotic patients at JUSH, July 2016.

Variables	N=74	Weight difference in kg	BMI kg/m²	WHR	%BF
		Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Source of food					
Hospital only Parents/Friends Both P-value**	26 7 41	2.75(1.72) 5.01(3.65) 4.91(2.88) 0.05	0.99(0.62) 1.87(1.38) 1.83(1.14) 0.004	1.74(2.14 0.86(0.65) 1.52(1.25) 0.430	1.15(0.77) 1.17(0.99) 1.37(0.76) 0.504
Diagnosis					
Schizophrenia Bipolar P*	53 21	3.68(1.71) 5.26(.70) 0.117	1.31(0.64) 1.93(1.54) 0.08	1.61(1.79) 1.54(1.41) 0.766	1.3(0.86) 1.41(0.72) 0.286
Drug adherence					
Non adherent Adherent P*	22 52	4.04(2.84) 4.45(2.70) 0.538	1.52(1.14) 1.60(0.96) 0.385	1.48(1.66) 1.65(1.41) 0.968	1.23(0.97) 1.43(0.76) 0.144
Duration of illness					
<6 months 6-12 months 1-2 years >2years P**	16 42 12 4	5.1(2.68) 4.0(3.12) 4.1(1.39) 1.9(0.41) 0.212	1.18(1.04) 1.48(1.18) 1.69(0.76) 0.65(0.18) 0.260	1.17(0.73) 1.75(1.18) 1.17(1.13) 1.73(0.18) 0.518	1.25(0.64) 1.24(0.82) 1.55(0.86) 0.88(0.48) 0.473

Variables		Weight	BMI	WHR	%BF
	n=74(%)	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Sex					
Male Female P*	43(58.1) 31(41.9)	3.89(2.11) 4.53(3.51) 0.040	1.34(0.70) 1.81(1.42) 0.004	1.48(1.52) 1.60(1.69) 0.769	1.17(0.87) 1.42(0.62) 0.030
Age					
15-24 25-34 >35 P**	31(41.9) 28(37.8) 15(20.3)	4.10(3.15) 4.38(2.35) 3.88(2.59) 0.854	1.60(1.29) 1.53(0.93) 1.43(0.92) 0.878	1.48(1.33) 1.57(1.75) 1.55(1.85) 0.975	1.24(0.74) 1.44(0.81) 1.10(0.80) 0.285
Residency					
Rural Urban P*	43(58.1) 31(41.9)	4.45(2.88) 3.73(2.63) 0.324	1.62(1.00) 1.44(1.18) 0.853	1.54(1.29) 1.51(1.93) 0.064	1.45(0.84) 1.03(0.63) 0.076
Marital status					
Single Married Divorced Widowed P**	32(43.2) 24(32.4) 15(20.0) 3 (4.40)	4.50(3.41) 4.24(2.38) 3.69(1.94) 2.33(1.76) 0.141	1.70(1.33) 1.46(0.85) 1.46(0.88) 0.88(0.63) 0.570	1.31(1.38) 1.69(1.84) 1.78(1.75) 1.48(0.15) 0.747	1.33(0.78) 1.21(0.78) 1.33(0.84) 0.48(0.27) 0.286
Educational status					
Primary school Secondary school No formal education Higher education P**	15(20.3) 37(50.4) 18(24.4) 4 (5.4)	4.15(2.61) 4.10(2.56) 4.52(3.43) 3.15(3.08) 0.844	1.52(0.78) 1.51(0.96) 1.69(1.46) 1.23(1.46) 0.869	1.76(1.05) 1.79(1.79) 1.18(1.63) 0.74(0.18) 0.459	1.38(0.79) 1.35(0.80) 1.15(0.76) 0.81(0.58) 0.482
Average monthly income					
<400 birr 401-1000 birr >1000 birr P**	42(56.8) 22(29.7) 10(13.5)	4.12 (2.79) 4.39(3.24) 4.10(2.78) 0.858	1.50(1.03) 1.66(1.36) 1.44(0.51) 0.818	1.45(1.45) 1.56(1.51) 1.55(1.49) 0.558	1.36(0.82) 1.18(0.68) 1.09(0.81) 0.478

Note: *-independent t-test, **- one way ANOVA test at p<0.05

Table 3: Association of substance use, food source with mean alteration in Wt, BMI, WHR and %BF" of psychotic patients at JUSH, Jimma, Ethiopia, July, 2016.

TREATMENT	N=74	Weight (kg)	BMI(kg/m²)	WHR	%BF
		Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Risperidone	27	4.39(2.66)	1.58(0.94	1.25(1.47)	1.31(0.89)
Haloperidol	17	3.40(2.14)	1.18(0.78)	2.05(2.20)	1.23(0.74)
Chlorpromazine	4	5.42(4.60)	2.13(1.75)	2.17(2.09)	1.4(0.79)
Risparidone with Amytriptline	15	4.44(3.62)	1.77(1.54)	1.39(1.24)	1.00(0.36)
Risperidone with sodium valproate	7	3.88(2.1)	1.4(0.70)	1.58(0.71)	1.44(0.85)
Haloperidol with sodium valproate	4	4.02(2.07)	0.95(0.95)	0.99(0.55)	1.80(1.16)
	P*	0.484	0.758	0.762	0.816

Note: One way ANOVA, *- p<0.05

Table 4: The mean alteration in body composition parameters after 12 weeks of treatment by different antipsychotic drugs at JUSH, Jimma, Ethiopia, July, 2016.

experienced greater weight gain and had more significant metabolic abnormalities than men. This may be due to variation in behavioral, hormonal as well as genetic factors [28].

In the current study the mean weight gained by patients taking Risperidone, Chlorpromazine and Haloperidol over 12 weeks were 4.39 kg, 5.43 kg, and 3.40 kg respectively. Individual antipsychotic drugs are consistently associated with different degrees of weight gain this is due to their varying affinities for diverse neurotransmitter receptors which are involved in the regulation of food intake and energy expenditure in the brain [29,30]. The result in current study is in agreement with a meta-analysis by Allison et al. reported a mean weight gain of about 3.8 kg and a mean gain in BMI of 1.2 kg/m^2 within the first 12 weeks of antipsychotic treatment with Risperidone and Haloperidol in previously drug-naive patients who were >15 years [4]. In another study done on 157 in-patients with chronic schizophrenia disorder assigned to treatment with Risperidone and Haloperidol over a 14-weeks period the reported result shows an increase in weight by 2.3 kg and 0.2 kg respectively [15]. Claus et al. and Anderson et al. also reported an increase in weight by 2 kg, 2.3 kg, and 2.8 kg respectively after 12 weeks of treatment with Risperidone [31,32]. There is slight difference with our findings. This may be due to differences in socio-cultural, economic, lifestyle difference and large sample size.

In the present study, increases in weight were observed when antipsychotics were combined with mood stabilizer that was 4.44 kg,

4.02 kg, 3.88 kg, on Risperidone with Amytriptilline, Risperidone with sodium valporate, and Haloperidol with sodium valporate respectively than mono therapy. This agrees with retrospective study by Meyeret et al. that reported a twofold increase in weight gain when lithium or valproate was added to Risperidone [30]. Another study also supports the interaction of different antipsychotic drugs increase risk of weight gain. An analysis of retrospective and prospective clinical reports suggested that a patient's risk of weight gain might be influenced by a synergistic interaction between age and polypharmacy [33].

Differential risk of weight gain associated with the various antipsychotic drugs seems to exist, high inter-individual variability among patients treated with a given agent suggests that personal, familial or genetic factors as well as changes in diet and activity levels may influence how much weight is gained [34].

Conclusion

In the present study, a significant alteration in body weight, BMI, waist to- hip ratio and percent body fat was observed among psychotic patients who took varieties of antipsychotic drugs for 12 consecutive weeks. The increase in body composition observed in this study was irrespective of socio-demographic and behavioral characteristics of the patients. The present study indicated the antipsychotic drugs effect on body composition not unusual regardless of the low income settings. Measures to prevent metabolic syndrome resulted from using these drugs should be kept in place.

Competing Interest

The authors declare that they have no competing interests.

Author's Contributions

EM: involved in conception, design, conducting and analysis, drafting the manuscript. AM involved in data interpretation, manuscript revision and write up. A was responsible for the diagnostic procedures and involved in data collection and interpretation. MI involved in data analysis and interpretation, and manuscript revision. All authors reviewed and approved the final manuscript.

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