



RESEARCH ARTICLE

The Relationship Between Physical Activity Level and Quality of Life in Individuals with Bipolar Disorder

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Abstract

Bipolar disorder (BD) is a serious mental illness that leads to poor quality of life (QOL). Lack of physical activity (PA) and sedentary behavior are among the risk factors that cause this condition. This study explored the relationship between PA levels and QOL in individuals diagnosed with bipolar disorder. 27 individuals with BD who received service from a Community Mental Health Center (CMHC) participated to the study. Inclusion criteria were being 18-59 years of age, regularly using of medication, and being in remission. The individuals with psychiatric comorbidities such as intellectual disability, organic brain disease, alcohol/substance abuse, and circadian rhythm disorder were omitted. All participants filled out Sociodemographic Data Form, International Physical Activity Questionnaire-Short Form (IPAQ-SF), and World Health Organization Quality of Life Scale-Short Form (WHOQOL-BREF). Most participants were not physically active (77.8%), and 22.2% had low physical activity levels. The mean IPAQ-SF score (MET minutes per week) was 363.87±337.06. The QOL-general health mean score was 6.88±1.62. The IPAQ-total score was significantly positively correlated with WHOQOL-BREF Psychological ($p<0.05$) and WHOQOL-BREF General mean scores ($p<0.01$). The correlation between IPAQ-total score and physical, social, and environment subscales was not statistically significant. Study findings revealed that there was a need to increase the PA levels of individuals with BD. Also, it has been found that as PA increases, individuals' psychological QOL increases. For this reason, it is essential to implement healthy life groups and follow up in terms of metabolic syndrome and chronic disorders in CMHCs for improving QOL.

Keywords

Bipolar Disorder, Physical Activity, Quality of Life

INTRODUCTION

Bipolar disorder (BD) is a serious mental illness that include include emotional highs (mania or hypomania) and lows (depression). These extreme mood swings lead to impairment in the functionality and quality of life (QOL) of individuals. BD treatment requires the combination of pharmacological and psychosocial interventions (Goodwin et al., 2016). People with BD are at greater risk of a reduced life expectancy and developing metabolic syndrome compared to

the general population. One of the factors that increase these risks is the unhealthy lifestyle behaviors of individuals (e.g., smoking, lack of physical activity) (Sylvia et al., 2013; Vancampfort et al., 2016; Bauer et al., 2016; De Hert et al., 2022). These risks can lead to poor health outcomes and negatively affect an individual's physical health (Bauer et al., 2016). National Institutes of Health guidelines (2013) refer to the significance of physical activity for improving overall health in the treatment of BD. In

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addition to beneficial effects of PA on physical health, adequate PA participation improves psychological well-being and quality of life (Thomson et al., 2015; Marquez et al., 2020).

Previous studies showed that individuals with BP were less physically active compared to healthy individuals in some research findings. Most of them did not meet the recommended 150 min of levels of moderate-vigorous PA per week and their observed sedentary behavior levels were high (Melo et al., 2016; Thomson et al., 2015; Vancampfort et al., 2016; Vancampfort et al., 2017). The mean amount of moderate or vigorous PA level of individuals with serious mental illnesses, including bipolar disorder was 38.4 minutes per day, their physical activity levels were lower than healthy controls (Vancampfort et al., 2017). In contrast, it was observed that there was no difference between individuals with BP and healthy individuals in terms of physical activity levels in some studies (Vancampfort et al., 2016). In literature, it has been shown that PA resulted in decreasing depressive symptoms and improvement in quality of life in individuals with BD (Sylvia et al., 2013a; Marquez et al., 2020; D'Angelantonio et al., 2022). Regular physical exercise was associated with lower depression and anxiety scores in people with affective disorders (D'Angelantonio et al., 2022). Although studies showed that physical activity led to positive results, they are criticized for being cross-sectional and not including a control group and also it is thought that the available data are not sufficient to show the effect of physical activity on quality of life of individuals with BD (Melo et al., 2016; Ashton et al., 2020; Marquez et al., 2020). Studies on physical activity in bipolar individuals are limited. Bipolar disorder is a serious mental illness that impairs people's quality of life. Outpatients with BD had a significantly lower physical and mental health-related QoL than healthy controls (Vancampfort et al., 2017). Recently, the focus has been not only on drug therapy in serious mental disorders, but also on personal recovery, taking into account well-being and quality of life. Hence, there has been a trend to treat BD in an integrative and holistic manner in community mental health services (Hoertel et al., 2021).

Studies showed that health promotion and wellness interventions positively affect the quality of life in individuals with BP. However, little is known about sedentary behavior in people with

BD and the relationship between PA and QoL in Turkey. Although there were more studies evaluating the relationship between physical activity and quality of life in mental illness in literature, the study evaluating this relationship in bipolar patients is also limited, and the results can be contradictory (Sylvia et al., 2013; Rosenbaum et al., 2014). Since there are lower physical activity levels in North America and Asia compared to European studies, it has been suggested to investigate whether geographic differences are effective on physical activity and sedentary behaviors in individuals with BD (Vancampfort et al., 2016; Vancampfort et al., 2017). In this sense, this study investigates the relationship between physical activity levels and quality of life in individuals diagnosed with BD.

METHODS

Participants and procedure

Information about physical activity levels (International Physical Activity Questionnaire - IPAQ-SF scores) and quality of life (WHOQOL-BREF-TR scores) was achieved retrospectively from the patient records for analysis within scope of the study. The sample size was obtained with the help of the G * Power program by taking $(1-\beta) = 0.80$ and $\alpha = 0.05$. The total number of people to be taken to the study was calculated as 27, with an effect size of 0.50 as a medium effect. Twenty-seven individuals with BD who received service from a Community Mental Health Center (CMHC) were included in our study. Inclusion criteria were being 18-59 years of age, using their medication regularly, and being in remission. The individuals with psychiatric comorbidities such as intellectual disability, organic brain disease, alcohol/substance abuse, and circadian rhythm disorder were omitted. The center's psychiatrist evaluated the criteria for being in remission by evaluating the health data of the participants. The study protocol was approved by Ethics Committee (23.05.2022-138/05) and written informed consent was obtained before starting the study.

Measures

Sociodemographic Data Form

Information regarding basic socio-demographics, gender, age, educational level, and employment status and clinical variables such as duration of illness was obtained with this questionnaire.

International Physical Activity Questionnaire-Short Form (IPAQ-SF)

The short form of the International Physical Activity Questionnaire (IPAQ-SF) was used to assess physical activity participation (Craig et al., 2003). The Turkish validity and reliability study of the scale was made by Sağlam et al. (2010). The items of the IPAQ-SF are structured to estimate weekly energy expenditure based on the frequency (number of days) and duration (minutes) of physical activity during the previous seven days for at least ten minutes. Physical activity intensity is categorized into vigorous activity, moderate activity, and walking. According to the scoring protocol of the questionnaire, by multiplying the metabolic equivalent task (MET) values with the duration and frequency of each activity level (vigorous: 8 METs, moderate: 4 METs, walking: 3.3 METs), a score is obtained as "MET-minute/week." The total score is calculated by summing MET-min/wk scores of three categories (Ashton et al., 2020).

World Health Organization Quality of Life Scale Short Form Turkish Version (WHOQOL-BREF-TR)

The WHOQOL-BREF scale was developed by the WHOQOL Group (1998), and its Turkish validity and reliability were made by Fidaner et al. (1997). The scale aim to assess how individuals perceive their own quality of life. It is a 5-point likert scale. Participants are asked to answer considering the last 15 days. The scale consists of 26 items. The WHOQOL-BREF include four domains: physical health, psychological, social relationships and environment. Two items from the Overall Quality of Life and General Health facet have been included. The WHOQOL-BREF scale does not have an overall score. Four different field scores are calculated with the scale. Higher scores in each area indicate higher quality of life. The values of Cronbach-Alpha, respectively, for the physical domain was 0.83, for the mental domain was 0.66, the social domain was 0.53, the environmental domain was 0.73. Pearson correlation coefficients for test-retest reliability ranged between 0.57 and 0.81.

Statistical Analyses

Data were analysed with the IBM SPSS 21 (IBM SPSS Inc, Chicago, IL) package program. Number and percentage are given as descriptors

for categorical data, and deviation for continuous data. Descriptive statistics were used as mean \pm standard for continuous data, and frequency and percentage for categorical data. The normality of data was checked by Kolmogorov-Smirnov test and graphically (box-line plot, Q-Q plots). The relationships between the variables were evaluated with the Spearman correlation coefficient. Level of significance was accepted at 0.05.

RESULTS

Participants were 27 individuals with BD, comprising 11 males and 16 females. The mean age of 27 participants was 39.85 ± 1.01 years. Most of the participants were married (51.9%), high school graduate (44.4%), unemployed (74.1%), and the mean duration of illness was 15.88 ± 15.00 years. The general characteristics of the participants are given in Table 1.

Table 1. General characteristics of the study participants

Demographic variables (n=27)	Mean \pm Sd
Age-years	39.85 \pm 1.01
Duration of illness	15.88 \pm 15.00
Gender	
Female	16 (59.3%)
Male	11 (40.7%)
Education	
Primary	6 (22.2%)
Secondary	2 (7.4%)
High school	12 (44.4%)
University	7 (25.9%)
Employment status	
Employed	7 (25.9%)
Unemployed	20 (74.1%)
Marital status	
Married	14 (51.9%)
Single	9 (33.3%)
Divorced	4 (14.8%)

Most participants were not physically active (77.8%), and 22.2% had low physical activity levels. The mean IPAQ-SF score (MET minutes per week) was 363.87 ± 337.06 . The overall-QOL score was 6.88 ± 1.62 (Table 2).

The IPAQ-total score was moderate significantly correlated with WHOQOL-BREF-TR Psychological ($p=0.016$), and WHOQOL-BREF-TR General health mean scores ($p=0.006$). IPAQ-total score and physical, social, environment

subscales of WHOQOL-BREF-TR were not significantly correlated (Table 3).

Table 2. The mean scores of IPAQ-total and WHOQOL-BREF-TR subscales

Variables	Mean \pm SD
IPAQ-total score (MET min per week)	363.87 \pm 337.06
IPAQ Moderate (MET min per week)	16.94 \pm 4.44
IPAQ Walking (MET min per week)	359.42 \pm 3.37
WHOQOL-BREF-TR General health	6.88 \pm 1.62
WHOQOL-BREF-TR Physical	27.62 \pm 3.91
WHOQOL-BREF-TR Psychological	21.37 \pm 3.70
WHOQOL-BREF-TR Social	9.55 \pm 2.45
WHOQOL-BREF-TR Environment	29.37 \pm 3.66

Table 3. Correlations between IPAQ-total score and WHOQOL-BREF-TR subscales

	R	P
WHOQOL-BREF-TR General health	0.511	0.006**
WHOQOL-BREF-TR Physical	0.291	0.141
WHOQOL-BREF-TR Psychological	0.461	0.016*
WHOQOL-BREF-TR Social	0.224	0.262
WHOQOL-BREF-TR Environment	0.321	0.103

DISCUSSION

The current study investigated the relationship between physical activity levels and quality of life of individuals diagnosed with BD followed up at CMHC. Study findings showed that the physical activity levels of study participants were low, and even they were not physically active. In light with previous studies (Michalak et al., 2005; Akvardar et al., 2006), participants had poor scores in the general health quality of life and other all QOL domains. In addition, total score of physical activity level was moderately correlated with psychological QOL and general health quality of life.

Physical activity level is categorised as Physically Inactive <600 MET-min/week, Low Physical Activity 600-3000 MET-min/week, Sufficient Physical Activity >3000MET-min/week) (Erdoğan et al., 2011). According to this, our study participants were physically inactive. Previous studies demonstrated that people with serious mental illness had less physically active and more sedentary than the general population (Thomson et al., 2015; Vancampfort et al., 2017). The recommended weekly amount of physical activity for health is at least 150 minutes. It was found that approximately half of individuals with severe mental illness did not fulfill this criterion (Vancampfort et al., 2017). There are conflicting findings on this subject in the literature.

For example, in another study by Vancampfort et al. (2016), it was observed that there was no significant difference between individuals with BP and controls in terms of total daily PA participation. In the light of this evaluation, the majority of our study participants were not physically active in accordance with the literature (Thomson et al., 2015). The possibility of bias of self-report scales may be one reason for these different results. Studies using objective measurement tools have shown that individuals' physical activity levels were lower than those using self-report scales. In studies where self-report scales were used, individuals reported themselves more physically active (Vancampfort et al., 2016). It is possible that there are more physically inactive individuals found in our study. Although there was evidence that different factors had effective on physical activity participation of individuals with BD, we could not examine the related factors due to our small sample size (Vancampfort et al., 2013; Vancampfort et al., 2016). This may be a limitation of our study.

There are findings in the literature that healthy promotion interventions including physical activity and healthy nutrition improved the quality of life as well as weight loss in individuals with BD (Van Citters et al., 2010; Sylvia et al., 2013b; Bauer et al., 2016). In line with literature, study

participants reported less satisfaction on general health quality of life and all quality of life domains. Research evidence suggests that the QOL of individuals with BD reported had poorer scores than that of physically ill or healthy individuals (Michalak et al., 2005; Akvardar et al., 2006; Anyayo et al., 2021). Furthermore, according to our study findings, total physical activity level was correlated with the Psychological-QOL and general health quality of life. In other words, physical activity increases, individuals' psychological well-being and general health QOL increase. Our findings are consistent with the literature. Vancampfort and colleagues (2017) demonstrated that 150 min/wk of physical activity had positive effects on physical, psychological, social, and environmental QoL in people with BD. Individuals with a diagnosis of BD who participated in physical activity reported less depression and better quality of life (Sylvia et al., 2011; Melo et al., 2016; Ashton et al., 2020). In a systematic review study by Marquez et al. (2020), the evidence showed that physical activity on well-being and quality of life in individuals with bipolar disorder is limited and cannot be attributed to only physical activity itself.

In addition to beneficial effects of PA on physical health, PA contributes to psychological well-being (Sylvia et al., 2013a). PA has buffering effects from stress and "feel good" effects on people. PA also helps to produce positive emotions and reduce more negative experiences (e.g., stress, depression) (Biddle & Mutrie, 2007). There is also good evidence to demonstrate that high PA levels produce improvements in both mental and physical well-being (Zayed et al., 2018). Furthermore, PA have benefits on mental health by reducing depressive symptoms and improving social and cognitive domains in people with severe mental illness (Rosenbaum et al., 2014; Melo et al., 2016). In a study, bipolar individuals who participated in the walking activity were found to have lower depression, anxiety and stress levels at the end of the program than those who did not (Ng et al., 2007). Therefore, our study findings suggest that an increase in PA has the potential to improve the psychological quality of life and mental health in people with BD. In this sense, it is important to carry out follow-up of metabolic values and healthy lifestyle and wellness programs for people with BD in CMHCs. However, since it was known that individuals with BD participated less physical

activity than recommended (Thomson et al., 2015), it is also important to investigate the variables associated with low physical activity of individuals with BD. In the literature, being male, being single, low education, high body mass index, antidepressant and antipsychotic drug treatment, medical comorbidity, perceived stress and difficulty in accessing health services, and motivational issues are mentioned as the barriers for participating in regular PA among the individuals with bipolar disorder (Vancampfort et al., 2013; Vancampfort et al., 2017). In future studies, it may be recommended to investigate the reasons for the low PA levels of the individuals with BD.

Although it is reported in the literature that PA/exercise has benefits in individuals, it is recommended that it should be addressed carefully in bipolar disorder. In a qualitative study, it was found that people diagnosed with BD believed that the exercise was beneficial in regulating mood fluctuations, daily routines and internal rhythms, but they expressed that exercise may have harmful effects besides its benefits (Wright et al., 2012). Although a cross-sectional study, Sylvia et al. (2013a) showed that less exercise was associated with depression whereas more exercise was related with more mania in individuals with BD. Similarly, some evidence emphasized the relationship between vigorous exercises and mania (Melo et al., 2016). Therefore, careful determination of PA levels in individuals with bipolar disorder and follow-up the PA programs with an expert is important. Therefore, addressing these issues may be useful in designing and implementation of exercise programs.

The cross-sectional design of the study and collecting data in a single CMHC are the limitations. The data on PA were collected using a self-reported measure. Thus, recall bias may exist. More objective measurement tools such as the accelerometer could have been used but this was not possible due to the retrospective design of the study. The number of participants was low. We did not evaluate the drug treatment protocol that the participants received. Some drug side effects may have affected individuals' healthy life behaviors like PA. Future studies are recommended to include longitudinal data with larger sample sizes and with control group. Investigating the factors that contribute to low levels of PA in individuals

with BD is important in developing programs in future studies.

Conclusion

Current study findings showed that people with BD had low levels of PA and QOL. So, study findings revealed the need to promote the physical activity levels of individuals with BD. Interventions to increase PA levels of people with BP as a potentially modifiable factor may be beneficial in improving mental well-being and quality of life. As a result, we determined that physical activity increases the general health quality of life and psychological QOL. More work is needed in the future.

Conflict of interest

No conflict of interest is declared by the authors. In addition, no financial support was received.

Ethics Statement

The study protocol was approved by Ankara Diskapi Training and Research Hospital Ethics Committee (23.05.2022-138/05) and written informed consent was obtained from the participants before starting the study.

Author Contributions

Study Design, SED, AGG; Data Collection, SED; Statistical Analysis, SED, AGG; Data Interpretation, SED; Manuscript Preparation, SED; AGG; Literature Search, AGG. All authors have read and agreed to the published version of the manuscript.

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