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Relationship between Physical Activity and Depression Score Patients with Schizophrenia

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Abstract

This study was conducted to identify the correlation between physical activity and depression score in patients with Schizophrenia. A cross sectional study involving 67 patients with schizophrenia was conveniently recruited from the inpatient ward of a mental health hospital in West Kalimantan, Indonesia. International Physical Activity Questionnaire-Short Form (IPAQ-SF) and Calgary Depression Scale for Schizophrenia was used to assess the level of Physical Activity and Depression in patients with Schizophrenia. Descriptive statistics was used to determine caregivers' socio-demographic characteristics, level of physical activity and depression. Spearman Rho correlation test was conducted to determine the relationship of physical activity and depression in patients with Schizophrenia. About 52.3% of schizophrenic patients had moderate to mild level of physical activity. The result showed that there was a significant, strong and positive correlation between physical activity and depression ($r = 0.859$, $p=0.000$). Most of the participants showed symptoms of depression. The findings indicated that lower physical activity was correlated with higher depression score in patients with schizophrenia. It is necessary to improve the mental health nursing services for patients with schizophrenia by scheduling their regular physical activity to minimize depression.

Keywords: Physical activity; Depression; Schizophrenia

1. Background

Schizophrenia is a chronic mental disorder, characterized by the emergence of positive symptoms (hallucinations and delusions), negative symptoms (apathy, withdrawal), disorganization and deterioration of cognitive abilities [1]. It is estimated that 20 million people in the world have schizophrenia and this number will continue to increase every year [2]. In Indonesia, the prevalence of schizophrenia is 1.7 per 1000 population or around 400,000 people [3].

Physiologically, schizophrenic patients have higher function of cardiovascular system and metabolism than the general population [4]. Sedentary behavior in schizophrenic patients will increase the risk of cardiovascular disease [5, 6]. This argument is supported by a meta-analysis reporting that sedentary behavior and lack of physical activity will increase the risk of cardiovascular disease, type 2 diabetes, and all-cause mortality [7].

Schizophrenic patients need physical activity. It has been indicated to contribute to the treatment of patients with chronic disease [8]. In addition, physical activity in schizophrenic patients has been indicated to improve cognitive skills and physical health [9]. This argument can be explained through a biological mechanism in the form of an increase in brain-derived neutropic factor (BDNF) and other neurotrophic factors [10, 11]. The fact is schizophrenic patients will experience obstacles to engage in physical activity and sports. This situation occurs because of lack of self-confidence, low mood and less social support [12]. It results in schizophrenic patients experiencing decreased motivation, social withdrawal, life quality decreasing, depression and increasing schizophrenia symptoms severity level [13].

The research indicates an increase in the prevalence of substance abuse, anxiety and depression in schizophrenic patients [1]. The prevalence of depression is 7-75% and it results in frequent relapse and hospitalization, increased risk of suicide, poor medication adherence, worse psychosis symptoms, and poor physical health compared to schizophrenic patients without depression [14, 15].

Previous studies have shown a relationship between physical activity and depression incidence and it significantly impacts on patients' physical health [6]. Until now, there are limited studies on the relationship between physical activity and depression in schizophrenic patients. The existing research focus more on the relationship between physical activity and depression incidence in elderly, so, further research is needed to explore the relationship between physical activity and depression incidence in schizophrenic patients in Indonesia.

2. Methods

2.1 Study design

The research design was descriptive correlative with cross sectional method. The number of respondents was 67 by using consecutive sampling technique. The respondents were inpatients at Mental Hospital of West Kalimantan Province. Further, the respondents' inclusion criteria were: (a) Schizophrenic Patients according to DSM IV-TR (psychiatrist recommendation in charge of patient) and inpatients. (b) Can read and write; (c) Willing and able to participate in research; (d) 20–60 years-old; (e) Not dependent on alcohol and drugs; (f) Patients in a stable period.

2.2 Participants

The sample size in this research was determined by using power analysis with a significance level (alpha) of 0.05 and power of test of 0.80 (Polit and Hungler, 1999). Previous research whose research variables were almost the

same as the determination of sample used 0.05 alpha and power of test of 0.80 obtained a correlation coefficient (r) of 0.30 (16), the sample in the study included 67 patients diagnosed with schizophrenia.

2.3 Data collection

Data collection was conducted based on diagnostic data of schizophrenic patients in medical records. The questionnaire was distributed to patients who met the inclusion criteria. Moreover, the researcher guided each question and how to fill in the answers.

2.4 Instrument

The questionnaire consisted of three parts. Part A consisted of data on demographic characteristics (number of items). Part B consisted of International Physical Activity Questionnaire-Short Form (IPAQ-SF) questionnaire and depression scores by using Calgary Depression Scale for Schizophrenia (CDSS).

2.5 Physical activity

Physical Activity was measured using International Physical Activity Questionnaire Guide-Short Form (IPAQ-SF). It was a questionnaire to measure physical activity. This questionnaire consisted of 7 questions based on the physical activity undertaken by the respondent during the last 7 days. The results of the interviews were processed using IPAQ scoring protocol guidelines. IPAQ used MET (metabolic equivalents of task) as the unit. The MET score for the calculation was as follows: Walking Activity = 3.3 MET, Moderate activity = 4.0 MET and Vigorous activity = 8.0 MET; which was multiplied by the intensity in minutes and days, then summed to obtain the final score for physical activity.

2.6 Depression

Depression signs and symptoms were measured by using Calgary Depression Scale for Schizophrenia (CDSS). This instrument was specifically designed to measure depressive symptoms in schizophrenic patients; this instrument explained overlapping depressive symptoms with negative symptoms or extrapyramidal symptoms (EPS) caused by the side effects of drugs [17]. The results indicated that the depressive symptoms found by using this questionnaire were more specific than the standard questionnaire for depression assessment such as the Hamilton Depression Rating Scale in this population. The systematic review to assess depressive symptoms in schizophrenic patients found that CDSS was the best choice for clinical and research purposes [18].

2.7 Statistical analysis

Data analysis in this research used a computer program. Descriptive statistics was performed by using frequency and percentage calculations for variables. The normality test by using Kolmogorov-Smirnov was conducted at p 0.05, by using the non-parametric test. Rank correlation analysis (Spearmans rho) was performed to examine the correlation between physical activity and depression scores in schizophrenic patients. The level of statistical significance was set at p 0.05.

3. Results

3.1 Demographic characteristics

This research involved 67 schizophrenic patients, aged 17 - 65 years-old. Most of them were male and married. Then, most of them were high school graduates and have been hospitalized for <6 months.

Characteristics	**Frequency (F)**	**Percentage (%)**
Sex		
Male	42	62.7
Female	25	37.3
Age		
17 – 25	**6**	**7.0**
26 – 35	**17**	**19.8**
36 – 45	**22**	**25.6**
46 – 55	**16**	**18.6**
56 – 65	**6**	**7.0**
Length of Inpatient Stay	45	52.3
< 6 Months	22	25.6
>6 Months		

Table 1: Socio-demographic characteristics of respondents (n = 67).

Physical Activity	**Frequency (F)**	**Percentage (%)**
Walking activity	45	25.6
Moderate activity	22	52.3
Vigorous activity	0	0
Total	67	100

Table 2: Physical activity level.

	Coefficient r	*p value*
Physical Activity	0.859	0.000
Depression Score		

Table 3: Relationship between physical activity and depression.

Table 2 shows that most of the schizophrenic patients have moderate physical activity as many as 45 people (52.3%) and there are no respondents who performed vigorous physical activity.

Based on the table, it is known that the significant value is 0.000 ($p < 0.05$). This result indicates that there is a relationship between physical activity and depression score in schizophrenic patients with a Spearmen coefficient (r) by 0.859 and indicating a positive correlation with a very strong correlation.

4. Discussion

Based on the results of the research, 52.3% patients performed low physical activity followed by moderate activity and 0 patient conducted vigorous physical activity. The lack of physical activity in schizophrenic patients caused the patient to experience depression. Several studies linked the lack of activity in schizophrenic patients to exacerbate negative symptoms and positive symptoms, especially for hallucination and delusion [9, 19]. When schizophrenic patients had minimal activity, they did not have a distraction of remembering past trauma events, hearing threatening noises and so on, so the patients were more easily to experience depression [20, 21].

The results indicated there was a significant relationship between physical activity and depression with a positive correlation and a very strong correlation. The results in this study were relevant with previous studies that low physical activity had a significant relationship with depression characteristics [6]. When a person conducts physical activity, the muscles need to absorb amino acids. Therefore, reducing the amount of amino acids had the potential to increase serotonin in the brain. Serotonin is a neurotransmitter that is important in controlling emotion, the memory function in the hippocampus [22]. It is a neurotransmitter that is important for emotional processing and serves the memory functions in the hippocampus [23, 24]. With the presence of serotonin, the release of serotonin occurs, which induced the release of corticotrophin-releasing hormone, so this decrease reduced the stress response associated with improved depression.

Based on research depression occurred due to a decrease in hippocampal volume and levels of markers of neurogenesis and an increase in the level of inflammation [1]. Conducting physical activity increased the volume of hippocampus and level of neurogenesis, then reduced the imbalance between anti and pro-inflation. In addition, physical activity was directly increasing other psychological factors such as self-esteem. Many studies suggested physical activity to reduce depression symptoms. The recommended duration was performing physical activity such as walking for 20 to 40 minutes, 3 times per week for 6 weeks [25, 26].

5. Conclusion

The results of the study conclude that there is a relationship between physical activity and depression scores in schizophrenic patients. The higher the physical activity, the higher the depression score in schizophrenic patients.

Lack of physical activity gives an impact on depressive symptoms, and affects the length of recovery process. The research also indicated that physical activity had a huge impact on depression management.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All author contributed equally in this study.

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