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DOI: 10.4103/jehp.jehp_904_21

# Impact of structured physical activity program on the level of functional ability of Persons with Mental Illness

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## Abstract:

**BACKGROUND:** A structured physical activity program has many health benefits. Physical activity improves the functional ability of a patient with mental illness as an adjunctive treatment. This study aimed to evaluate the efficacy of a physical activity program on the level of functional ability of patients with mental illness.

**MATERIALS AND METHODS:** A pre-experimental research design and one group pre-post design were adopted. Thirty-one in-patients with mental illness who met the inclusion criteria were recruited for the study using convenient sampling. Baseline data were collected using sociodemographic and illness profiles developed by the researcher and validated by the experts. Functional ability and illness severity were assessed using the standardized World Health Organization Disability Assessment Schedule (WHODAS) (36-item version) and the Clinical Global Improvement Scale. Pretest, i.e., intervention with structured physical activity, was administered for 40 consecutive days. A posttest was given 30 days after the intervention ended to assess the impact of the structured physical activity program on the level of functional ability among the study participants.

**RESULTS:** The impact of structured physical activity on functional ability was measured using the WHODAS 2.0, a 36-item version. The paired Sample *t*-test and the Wilcoxon Rank test analyzed the data. There was a significant improvement in the overall functional ability of study participants at  $P = 0.001$ .

**CONCLUSION:** The study findings support that structured physical activity substantially impacts functional ability among patients with mental illnesses.

## Keywords:

Functional ability, intervention, mental illness, structured physical activity program

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Received: 19-06-2021  
Accepted: 21-12-2021  
Published: 29-07-2022

## Introduction

“Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to contribute to his or her community.”<sup>[1]</sup> Mental health problems contribute significantly to the leading global cause of disability.<sup>[2,3]</sup> Even Indian data on mental health problems are one of the major areas of concern.<sup>[4]</sup> Functional ability is an individual’s potential to perform normally expected activities and tasks. Mental illness causes a break in the everyday lives of these

people. It reduces functional abilities, which are also a significant cause of disability.<sup>[1]</sup> Physical activity is associated with a range of health benefits, and its absence can have harmful effects on health and well-being.<sup>[5]</sup> Besides, physical activity improves health and minimizes risk factors for chronic diseases. Its beneficial impact on mental health is a well-known fact.

Furthermore, psychiatric patients who regularly exercised reported higher health-related quality of life (QOL).<sup>[6]</sup> Based on the evidence, researchers recommend exercise as an adjunct to other forms of treatment in mental illness.<sup>[7]</sup> Several

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**How to cite this article:** Gorain RK, Ramu R, Sinha P, Govindan R. Impact of structured physical activity program on the level of functional ability of Persons with Mental Illness. *J Edu Health Promot* 2022;11:226.

epidemiological studies have found significant cross-correlations between mental health and physical activity levels in the general population.

In an adult US population, regular physical activity is associated with a significantly lower prevalence of major depression, panic disorder, agoraphobia, social phobia, and specific phobia. Prospectively, the overall incidence of mental disorders and comorbid mental disorders and the incidence of anxiety, somatoform, and dysthymic disorder decreases by physical activity.<sup>[8]</sup> Furthermore, a 4-year prospective study revealed that physical activity decreases the incidence rates of depressive and anxiety disorders in older adults.<sup>[9]</sup> Finally, Ten Have *et al.* reported in their epidemiological study that patients engaging in regular physical activity were more likely to recover from their mental illness at a 3-year follow-up.<sup>[10]</sup>

Around 1 billion individuals worldwide suffer from some form of mental illness today. In the majority of instances, the condition manifested itself throughout adolescence or early adulthood, resulting in daily personal dysfunction and a colossal economic and social burden.<sup>[11]</sup> It is recommended that the average adult benefits from 75 to 150 min of exercise a week.<sup>[12]</sup> There is a growing interest in investigating the relationship between physical activity and mental health.<sup>[13-16]</sup>

Numerous studies supported the notion of the functionality of the dose–response relationship between exercise and mental health.<sup>[17,18]</sup> Some studies showed effects on symptoms, cognition, and brain activity because exercise practice depends exclusively on its duration, intensity, and the way of conducting the exercise individually. Moreover, the study shows that increasing physical activity levels had a significant graded relationship with functional performance.

However, it remains unclear whether improvements in physical function can lead to lower rates of disability. In addition, there is much less evidence of the effect of structured physical activity on the functional ability of patients with mental illnesses, and there is a lack of significant Indian data on the effectiveness of physical activity on the functional ability of a patient with mental illnesses. This current study aimed to evaluate the effectiveness of a structured physical activity program on the level of functional ability of in-patients diagnosed with mental illness in the Indian population. The study's novelty stems from the fact that it reported a beneficial clinical outcome of structured physical activity for the first time in the Indian population, which may facilitate clinicians in making better therapeutic decisions with good prognostic outcomes.

## Materials and Methods

### Study design and setting

A one-group pretest–posttest design was chosen for the pre-experimental research. Before implementing a structured physical activity program, a baseline functional ability assessment was performed. A structured physical activity program of 40 consecutive days of 30 min per day was carried out, followed by a posttest evaluation to determine the effectiveness of the structured physical activity program on functional ability. The study was conducted in the closed psychiatric wards of the tertiary care mental health institute at Bengaluru.

### Study participants and sampling

The target population for this study includes patients diagnosed with severe mental illnesses. Accessible patient populations aged between 18 and 50 years diagnosed and admitted to the hospital with severe mental illness. They were treated in closed psychiatry wards for more than 3 months. During the intervention, these patients were declared physically fit with reduced severity of psychiatric symptoms. This study included patients with a Clinical Global Improvement score of 0–5 and excluded uncooperative patients. Moreover, this study had also excluded patients with comorbid physical illness that may become aggravated/worsened due to regular physical activities such as hypertension, vertigo, and pain in the joints.

Nonprobability convenient sampling technique was used for selecting the participants in this study. The estimated sample size was  $N = 31$ .

### Data collection tools and techniques

Before implementing a structured physical activity program, a baseline functional ability assessment was conducted. A 40-day structured physical activity program for 30 min per day was conducted, followed by a posttest assessment to determine the structured physical activity program's effectiveness on functional ability. The effectiveness of structured physical activity on functional ability was measured using the World Health Organization Disability Assessment Schedule 2.0, a 36-item version, self-administered scale to capture the level of functioning in six domains of life. Five subdomains were analyzed using the Paired-Sample *t*-test, and the Wilcoxon Rank test analysis domain-3 (self-care ability). The results were tabulated in the below tables.

### Ethical approval and informed consent

Ethical permission was obtained from the Institutional Ethical Committee (IEC) of NIMHANS, Bengaluru, to carry out the study. The study protocol was approved by the IEC (Ref-NO. NIMH/DO/IEC (BEH. Sc. DIV)/2016

Date: April 19, 2017). A written informed consent form was obtained from all the participants.

### Results

Table 1 reveals that in Paired *t*-test analysis, there is a significant improvement in the overall functional ability of study participants at  $P = 0.001$  as well as in terms of the domain of functional ability, i.e., understanding and communicating, life activities, and participation in society at  $P = 0.001$ ,  $P = 0.02$ , and  $P = 0.001$ , respectively.

Table 2 shows that applying the Wilcoxon Rank test for a subdomain; the self-care ability results in the same median and 25<sup>th</sup> quartile for pre-and posttest intervention. However, Figure 1 indicates that the distribution of scores is different with a maximum preintervention score of 68.75 and a postintervention score of 37.50. Among 31 study participants, the difference in score from preintervention to postintervention. Five female participants score-6.25. In contrast, the score of 12 participants in pre-and postintervention remains

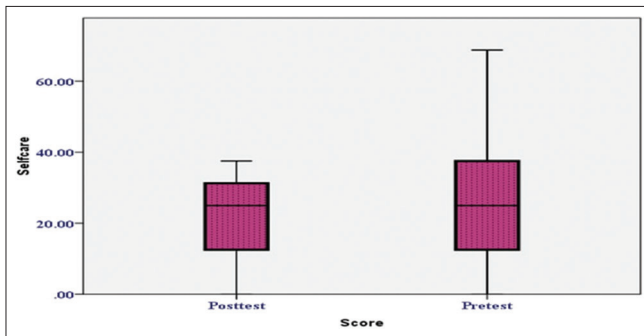


Figure 1: Distribution of Pre-and Postintervention the Self-care Ability Score

the same, and the remaining 14 participants show an improvement in self-care ability by less scoring in the post intervention score. The comparison of pre-and post intervention scores for the self-care domain shows a significant increase at  $P < 0.05$  [Figure 1].

### Discussion

Patients with mental disorders display high comorbidity of physical conditions such as respiratory, metabolic, cardiovascular, and neurologic diseases.<sup>[19,20]</sup> Many of the above conditions are linked to overweight, smoking, and an unhealthy lifestyle;<sup>[21]</sup> therefore, lifestyle interventions based on nutrition and exercise are promising approaches for reducing physical comorbidity.<sup>[22]</sup> Furthermore, psychiatric patients who regularly exercised reported higher health-related QOL in a cross-sectional study.<sup>[23]</sup> Several epidemiological studies have found significant cross-correlations between mental health and physical activity levels in the general population. Recent research has demonstrated that structured physical activity is a critical component that improves curative and preventive care for physical and mental health.<sup>[24-26]</sup> However, most research is conducted among individuals with mental illnesses who live in the community and are treated in mental health clinics. Moreover, patients and mental health practitioners alike do not fully understand or appreciate the benefits of activity, and it appears to be a frequently overlooked strategy in mental health therapy.

This study investigated the impact of physical activity on mental and physical health in adults with severe mental illness. The findings of this study indicated that there was a significant improvement in the overall functional ability of study participants at  $P < 0.001$  as well as in terms

Table 1: Comparison of pre-and post intervention of functional ability scores (n=31)

Domain	Mean (SD)	Minimum value	Maximum value	Mean difference (95%-CI of the difference)	P
Understanding and communicating					
Preintervention	38.04 (16.69)	8.33	70.33	8.06 (5.24-10.88)	0.001*
Postintervention	29.97 (13.71)	8.33	62.50		
Getting around					
Preintervention	36.77 (14.06)	0.00	60.00	2.90 (-0.23-6.04)	0.068
Postintervention	33.87 (12.82)	0.00	55.00		
Getting along with people					
Preintervention	39.19 (16.49)	15	80.00	3.22 (-0.89-7.34)	0.120
Postintervention	35.97 (19.34)	10	80.00		
Life activities					
Preintervention	32.86 (10.20)	12.50	46.88	3.12 (1.20-5.04)	0.002*
Postintervention	29.74 (10.29)	09.38	46.88		
Participation in society					
Preintervention	52.62 (9.20)	37.50	31.25	5.64 (3.32-7.96)	0.001*
Postintervention	46.98 (9.60)	31.25	68.75		
Total score					
Preintervention	37.55 (9.18)	15.69	56.39	4.90 (3.60-6.19)	0.001*
Postintervention	32.65 (8.27)	15.00	48.75		

\*Significant level  $P < 0.05$ . SD=Standard deviation, CI=Confidence interval

**Table 2: Comparison of pre-and post intervention of self-care ability scores (n=31)**

Domain	Minimum value	Maximum value	Median (25 <sup>th</sup> and 75 <sup>th</sup> )	P
Self-care ability				
Preintervention	0.00	68.75	25 (12.5-37.5)	0.006*
Postintervention	0.00	37.50	25 (12.5-31.2)	

\*Significant level  $P < 0.05$ 

of the domain of functional ability, i.e., understanding and communicating, life activities, and participation in society at  $P < 0.001$ ,  $P < 0.01$ , and  $P < 0.001$ , respectively. In a group of schizophrenia patients who participated in a 16-week 6-min exercise program, symptoms improved.<sup>[27]</sup> Similarly, regular physical activity was associated with a significantly decreased prevalence of current major depression and anxiety disorders.<sup>[28]</sup> In addition, a study on physical activity and QOL among adults with paraplegia indicated a strong positive relationship between levels of physical activity and all QOL dimensions.<sup>[29]</sup> Moreover, a meta-analysis study found that short-or long-term physical training enhanced both positive and negative symptoms.<sup>[25]</sup> Thus, our finding supports the notion that structured physical activity may have a clinical prognostic impact on severe mental illness patients and adopting a well-structured physical activity in conjunction with rational pharmacological intervention facilitates the overall QOL and prognostic outcomes in patients with mental illness.

Mental health nurses are uniquely qualified to respond to the physical health requirements of patients suffering from mental illness.<sup>[30]</sup> Nurses, as a key professional group in mental health care, are especially important in reorganizing health-care services to better help people with mental illnesses in their recovery and well-being.<sup>[31]</sup> Nurses are particularly well-suited to this profession because of the intimate bonds and trust they create with their patients, allowing them to get a unique insight into their circumstances.<sup>[32]</sup>

Collectively, this study aids in the comprehension of the efficacy of organized physical activity as adjuvant therapy. Nurses must be aware of the benefits of structured physical activity, which can be accomplished through education, as nurses are the primary point of contact for patients and can serve as a motivator. By gaining a thorough understanding of the benefits of structured physical activity as adjuvant therapy, nurses can assist patients in engaging in it and so improving their functionality, better prognostic outcomes, and QOL.

### Limitation and recommendation

The present study is limited by its small sample size. Even though statistically significant differences were observed, this study is confined to short-term intervention, which may not provide strong evidence toward the significance

of a structured physical activity program. Hence, well-structured research should be repeated with a larger sample size. There is a lack of control group for comparison of finding, as the study design itself is one group pretest–posttest design. Other external factors contributing toward the improvement of functionalities such as medication, nutrition, and electroconvulsive therapy was not considered. Numerous studies, however, have established a relationship between second-generation antipsychotic medication therapy and metabolic syndrome. For instance, olanzapine and clozapine both increase the risk of diabetes, obesity, and low level of high-density lipoprotein.<sup>[33,34]</sup> It is likely that homogeneous groups and a balanced diet or category of medications throughout the study might have resulted in more important findings and conclusions. Additional research incorporating physical activity and a balanced dietary or therapeutic regimen, as well as encouraging groups emphasizing the value of a healthy lifestyle, is required. Non-generalizability to all individuals with mental illnesses, as the study was confined to only admit in the closed psychiatry ward.

### Conclusion

The above study findings concluded that structured physical activity has a significant impact on the betterment of functional abilities among patients with mental illnesses. Hence, one can consider a structured physical activity as adjuvant therapy for standard conventional treatment in the field of mental health care for improvement in functional ability and overall QOL.

### Ethical considerations

The research protocol was presented in an institutional review board and approved (Ref-NO. NIMH/DO/IEC (BEH. Sc. DIV)/2016 Date: 19<sup>th</sup> April 2017). Individual consent was obtained from each study participant.

### Acknowledgment

Researchers are thankful for the organizational authorities and study participants.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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