DOI: 10.7860/JCDR/2025/74799.20458

Original Article

Physiotherapy Section

Level of Physical Activity and its Correlation with Mental Health in Community-dwelling Older Individuals: A Cross-sectional Study

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ABSTRACT

Introduction: The global population is ageing rapidly. Physical activity is one of the important factors that can positively impact physical function, mental health and quality of life. Hence, the promotion of healthy living and active ageing is essential for achieving an active and healthy life during this phase.

Aim: To evaluate the level of physical activity and its correlation with mental health in community-dwelling older individuals.

Materials and Methods: A cross-sectional study was conducted from November 2023 to January 2024 at the Apollo Institute of Physiotherapy in Ahmedabad, Gujarat, India. Data was collected from various community-dwelling older individuals in East Ahmedabad, Gujarat, India. The nature and purpose of the study were explained and written informed consent was obtained from a total of 111 participants. The level of physical activity was measured using the Rapid Assessment of Physical Activity (RAPA) (in both English and Gujarati versions). Wellbeing status was measured using the World Health Organisation-5 (WHO-5) wellbeing index (also in English and Gujarati versions). Spearman's correlation coefficient was used to determine the correlation between the level of physical activity and wellbeing status in community-dwelling older individuals. The level of significance was set at a p-value of <0.05.

Results: The ages of participants ranged from 60 to 80 years, with a mean age of 70.11±3.98 years. Out of 111 participants, 65 were male (58.56%) and 46 were female (41.44%). The mean RAPA score for the study participants was 2.42±1.14, and the mean WHO-5 wellbeing index score of participants was 13.99±3.39. A positive correlation was found between the level of physical activity and wellbeing status (r-value=0.922, p-value=0.001), which was statistically significant.

Conclusion: The present study showed a significant very strong positive correlation between the level of physical activity and the mental health of community-dwelling older individuals. Clinicians may advise older individuals to engage in physical activity to improve their mental health outcomes.

Keywords: Aged, Mental wellbeing, Rapid assessment of physical activity, The World Health Organisation- Five wellbeing index (WHO-5)

INTRODUCTION

The proportion and actual number of older adults have grown significantly over the past few decades due to decreased fertility rates and rising life expectancy, a trend that is expected to continue. Healthy ageing, defined by the WHO as "the process of developing and maintaining the functional ability that enables wellbeing in older age," is considered a key challenge of this decade [1]. Growing older is a natural aspect of life. The accumulation of various types of molecular and cellular damage over time results in ageing [2]. This phase of life is marked by a gradual decline in physical and mental capacities and an increased likelihood of illness. By 2025, the elderly, defined as those aged 60 years and over, are predicted to make up 22% of the global population [3]. Physical activity is an important factor that can affect the rate of ageing [4]. Physical activity refers to any bodily movement produced by skeletal muscles that requires energy as an input. It includes all daily activities such as playing, carrying out household chores, travelling and activities related to work and recreation [5]. An active lifestyle helps to enhance health and wellbeing, and it reduces hospitalisation and care requirements, mortality and the risk of premature death [6]. Existing evidence indicates that low levels of physical activity are prevalent among older individuals worldwide. In India, physical activity levels among older adults remain low, primarily due to socio-cultural, economic and health-related barriers. Limited literature has evaluated the level of physical activity and its relationship with mental health measures [7-10].

With the rising prevalence of mental health issues in older adults, it is essential to study the correlation between physical activity levels and mental health due to the growing ageing population and the increasing burden of mental health issues in later life. Recently, attention has been drawn to the optimal physical and mental health of community-dwelling older individuals. With the advancement of various available facilities, the level of physical activity may be reduced.

With the considerations mentioned above, the present study was designed to evaluate the level of physical activity in community-dwelling older individuals using RAPA-1 and its correlation with mental health using the WHO-5 wellbeing index. The primary objective was to assess the level of physical activity by using RAPA (in both English and Gujarati versions) and mental wellbeing by using the WHO-5 wellbeing index (also in English and Gujarati versions). The secondary objective was to find the correlation between physical activity levels and mental health in community-dwelling older individuals.

MATERIALS AND METHODS

A cross-sectional study was conducted from November 2023 to January 2024 at the Apollo Institute of Physiotherapy in Ahmedabad, Gujarat, India. Data was collected from various community-dwelling older individuals in East Ahmedabad, Gujarat, India. Ethical approval was obtained from the Institutional Ethical Committee (IEC) (AIP/IEC/Comm.rehab/2022-23/11-R). The nature and purpose of the study were explained to each participant, and informed written consent was obtained from all participants.

Inclusion criteria: Participants age 60 years and above, both male and female participants were included in the study.

Exclusion criteria: Participants with any major musculoskeletal, neuromuscular condition or cardiorespiratory condition, severe cognitive impairment (Mini-Cog score <3) [11] were excluded from the study.

This was a time-bound study, and a total of 111 community-dwelling older individuals from Ahmedabad who were available during the study duration were included.

Study Procedure

Participants were selected based on the inclusion and exclusion criteria and recruited. The study procedure was explained, and written consent forms were obtained from the participants. Demographic details of the participants were collected. The level of physical activity was measured using the RAPA (in both English and Gujarati versions). Wellbeing status was measured using the WHO-5 wellbeing index (also in English and Gujarati versions).

Rapid Assessment of Physical Activity (RAPA)

The RAPA is a valid and user-friendly tool for assessing the physical activity levels of older adults. This nine-item questionnaire consists of yes or no questions regarding physical activity levels, ranging from sedentary to vigorous physical activity, as well as strength training and flexibility. It is commonly used in clinical practice to assess physical activity. The questionnaire instructions provide graphic and text depictions of light, moderate and vigorous physical activities. The total score from the first seven items ranges from 1 to 7 points, with the respondent's score categorised into levels of physical activity: 1=sedentary, 2=underactive, 3=underactive with regular light activities, 4 and 5=underactive regularly and 6 and 7=active. Responses to the strength training and flexibility items are scored separately, with none=0, strength training=1, flexibility=2, or both=3. Healthcare practitioners are encouraged to briefly discuss physical activity with their patients. The RAPA accurately distinguishes between older adults who engage in regular moderate physical activity and those who do not [12].

The Gujarati version of RAPA is available, and this translation and cross-cultural adaptation was completed in 2022. The Gujarati RAPA reported good face and content validity and test-retest reliability, with a weighted kappa (for RAPA1: 0.82 and RAPA2: 0.73), which is considered very good [13].

WHO-5 Wellbeing Index

The WHO-5 wellbeing index is a self-reported measure of subjective psychological wellbeing status [14]. The WHO-5 wellbeing Index was first developed in 1998 by the WHO Regional Office in Europe as part of a project on measuring wellbeing in patients receiving basic healthcare. The WHO-5 is a quick questionnaire consisting of five simple questions that represent the subjective wellbeing of the respondents. The scale has adequate internal and external validity in screening for depression among older individuals [15,16]. Thus, it serves as an essential tool for addressing mental health issues in busy healthcare settings.

The Gujarati version of the WHO-5 wellbeing index is available, and the reliability and validity of this scale in the Gujarati version were assessed in 2022. This version of the scale reported good face and content validity and excellent test-retest reliability (ICC=0.89) [17].

STATISTICAL ANALYSIS

The data were analysed using the Statistical Package for Social Sciences (SPSS) software, version 26.0. Descriptive statistics such as frequency, percentage, mean and Standard Deviation (SD) were used for summarisation. Spearman's correlation coefficient was employed to determine the correlation between the level of physical activity and wellbeing status in community-dwelling older individuals. The level of significance was set at a p-value <0.05. The Spearman correlation coefficient ranges from -1 to +1; a positive value indicates a positive correlation, while a negative value indicates a negative correlation. The interpretation for the correlation coefficient is as follows: 0.00-0.10=negligible correlation, 0.10-0.39=weak correlation, 0.40-0.69=moderate correlation, 0.70-0.89=strong correlation, and 0.90-1.00=very strong correlation.

RESULTS

The age of participants ranged from 60 to 80 years, with a mean age of 70.11±3.98 years. Gender distribution is shown in [Table/Fig-1]. The mean RAPA score and the mean WHO-5 wellbeing index score of participants is shown in [Table/Fig-2]. Level of physical activity of RAPA is shown in [Table/Fig-3].

Gender	n (%)
Female	46 (41.44)
Male	65 (58.56)

[Table/Fig-1]: Gender distribution.

Variable	Mean±SD
Age (years)	70.11±3.98
RAPA	2.42±1.14
WHO-5 wellbeing index	13.99±3.39

[Table/Fig-2]: Descriptive statistics of age, RAPA and WHO-5 wellbeing index.

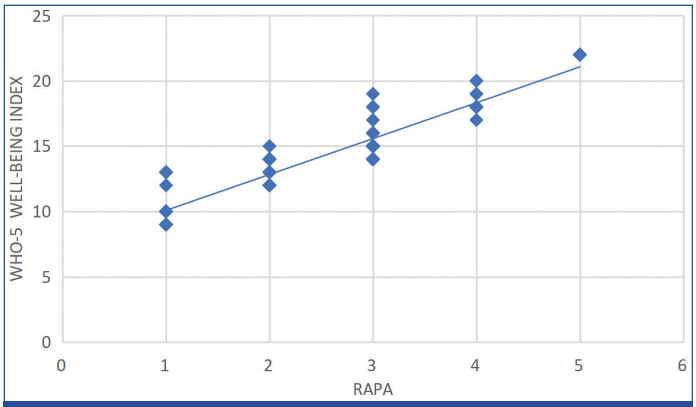
RAPA 1 Physical activity level	n (%)
Sedentary	31 (27.9)
Under-active	24 (21.6)
Under-active regular light activities	40 (36)
Under-active regular	10 (9)
Active	6 (5.4)

[Table/Fig-3]: Level of physical activity RAPA-1.

To examine the correlation between the level of physical activity and wellbeing status, Spearman's correlation coefficient was used. A very strong positive correlation was found between the level of physical activity and wellbeing status (r-value=0.922, p-value=0.001), which was statistically significant [Table/Fig-4,5].

Variables		WHO-5 (wellbeing index)
RAPA (Level of physical activity)	Spearmen correlation	r=0.922
	Sig. (2-tailed)	0.001
	N	111

[Table/Fig-4]: Correlation between physical activity level and mental health.



[Table/Fig-5]: Scatter plot diagram of physical activity levels (RAPA) and Mental health (WHO-5 wellbeing index).

DISCUSSION

The analysis indicated a statistically significant, a very strong positive correlation between the level of physical activity and mental health, suggesting that a higher level of physical activity increases the wellbeing status of individuals. The results of this study align with findings by Mohd Faisal AF et al., which indicated that higher physical activity levels were associated with better mental health in Malaysian older adults [9]. Present study results were also consistent with systematic reviews showing that physical activity reduces mental health issues [18,19]. Physical activity has been shown to

significantly reduce symptoms of anxiety and depression. A meta-analysis by Anderson E and Shivakumar G found that physical activity is associated with moderate reductions in depression [20]. The mechanism behind this effect involves the release of endorphins during physical activity, which act as mood enhancers [21]. Additionally, physical activity stimulates the production of neurotransmitters like serotonin and norepinephrine, which play crucial roles in mood regulation [22].

From a socio-psychological perspective, present study findings suggest that physical activity can reduce depression by promoting social contact and increasing self-esteem and self-efficacy. Recent research continues to support the positive correlation between physical activity levels and mental health conditions, including anxiety, depression, and stress, while also promoting overall psychological wellbeing [23]. The findings of the current study imply that physical activity is one of the modifiable risk factors that can improve mental health outcomes, which was consistent with an Indian study conducted by Kumar M et al., [24].

A meta-analysis of 49 prospective cohort studies, totaling 1,837,794 person-years, found that those engaging in vigorous physical activity were 17% less likely to develop depression than those with modest activity [25]. A similar investigation conducted in Brazil with 88,522 older individuals found that various types of physical activity decrease the likelihood of depression, which was consistent with the results found in present study [26]. The strength of present study lies in the use of a self-reported validated scale with excellent reliability among community-dwelling older adults in Gujarat, India. The results of these studies support including physical activity in everyday routines and health campaigns aimed at improving mental health.

Limitation(s)

Some limitations include the reliance on self-reported outcome measures and the limited number of samples included from Ahmedabad. To improve generalisability, further research is suggested with a larger sample size and objective outcome measures that involve direct observation of physical activity levels.

CONCLUSION(S)

Research findings advocate for the incorporation of physical activity into daily routines and public health strategies aimed at enhancing mental wellbeing. Clinicians may prescribe physical activity to older individuals to improve mental health outcomes. Physical activity interventions are safe, inexpensive and offer a wide range of health-related benefits.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Aug 09, 2024
- Manual Googling: Nov 19, 2024
- iThenticate Software: Nov 21, 2024 (16%)

ETYMOLOGY: Author Origin

EMENDATIONS: 7

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **Aug 08, 2024**
Date of Peer Review: **Aug 27, 2024**
Date of Acceptance: **Nov 23, 2024**
Date of Publishing: **Jan 01, 2025**