

Association between physical fitness levels and quality of life in people with epilepsy

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Abstract

Background: The aim of the study was to investigate the association of physical fitness with mental health scores in persons with epilepsy from India.

Methods: One hundred and fifty three consecutive persons with epilepsy with seizures controlled on optimal AED dosages for the last two years, aged 18–60 formed study population. Data was collected included demographics, seizure control. Relevant data on QOL was be collected through a self-reported quality of life questionnaire, the SF-12 from which Physical component scores (PCS) and Mental component scores (MCS) were derived. Physical fitness evaluation included: Body mass index, supervised six minute walk test and stepper test.

Results: The mean age of the cohort was 25.5±9.6 years with 82(53.5%) men. The mean body mass index was 29.6±6.4. The average distance walked in six minute walk test was 387.0 ± 73.8 meters and the average on a stepper test in a minute was 28.1 ± 9.2 steps. The average score on PCS of SF-12 questionnaire was 46.3 ± 7.7 and on MCS was 45.8 ± 10.4. There was no significant correlation between score on MCS and the measured physical fitness variables. However, both distance walked in six minute walk test and performance on stepper test showed significant correlation with PCS.

Conclusion: Simple tests like six minute walk test, one-minute stepper test may help to determine physical fitness scores in people with epilepsy. Although the current study did not show an association between mental and physical fitness scores, further robust trials are required to evaluate the same.

Keywords: Epilepsy; physical activity; fitness; six minute walk test; quality of life

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Received 22 July 2019; Revised 3 September 2019; Accepted 11 September 2019; Published 19 September 2019

Citation: Vooturi S, Anil P, Kandula A, Ali MM, Sailakshmi K, Yazala M, Jayalakshmi S. Association between physical fitness

levels and quality of life in people with epilepsy. J Med Sci Res. 2019; 7(4):99-102. DOI: <http://dx.doi.org/10.17727/JMSR.2019/7-17>

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Introduction

Around 65 million people across the world live with epilepsy [1, 2]. It is well known that people with epilepsy (PWE) have higher incidence and prevalence of depression, anxiety thus leading to a lower quality of life (QOL) scores than general population [3-10]. Until recently, PWE have not been advised in physical exercise/ activity partly because of overprotection, fear, and ignorance about the risks and benefits of physical activity practice [11, 12]. As a result, not surprisingly, trials, which compared physical fitness in PWE with the general population, reported worse physical fitness in PWE [13-16].

However, it is well established that physical activity practice promotes several health benefits especially in patients with chronic diseases, where, physical activity practice reduces the levels of depression [17] and anxiety [18] and improves quality of life [19]. Moreover, studies done in western, developed countries, have reported a positive association between being physical activity and reduction in depression/ anxiety in PWE reported positive results for the physically active [20-23]. However, very little to sparse literature on role of physical fitness and QOL in PWE from developing countries has been reported in literature. This is important as nearly 80% of PWE live in developing and low to middle income countries [24]. Therefore, the aim of this study was to verify the association between physical fitness levels and quality of life in PWE in tertiary referral center in South-India.

Methodology

Consecutive persons with epilepsy with seizures controlled on optimal AED dosages for the last two years, attending the Out-Patient Epilepsy Clinic of Krishna Institute of Medical Sciences, Secunderabad, 153 subjects aged 18–60 years were recruited after obtaining an informed consent. The study was approved by Institutional Ethics Committee. Patients with cognitive or behavioral problems, musculo-skeletal or inability to do a six minute walk test and failure to obtain an informed consent formed the exclusion criteria.

Data was collected using a standard form for the following information: demographics, antiepileptic drug (AED) profile, seizure control and remission. Relevant data on QOL was collected through a self-reported quality of life questionnaire, the SF-12. Based

on the rating on the 12-point SF-12 scores, Physical component scores (PCS) and Mental component scores (MCS) were derived for each patient, using a validated equation. For an assessment of physical fitness, all the patients underwent comprehensive assessment for: Body mass index (BMI) based on WHO guidelines, supervised Six minute walk test and stepper test.

Statistical analysis

After ensuring the homogeneity of data, all continuous variables were expressed as mean \pm standard deviation; whereas all categorical variables were expressed at percentages. Association between MCS scores with PCS scores, distance walked in six minutes, score on one-minute stepper test and BMI was evaluated using Pearsons and Spearman correlation. A $p \leq 0.05$ was considered significant. All statistical analysis was done using Statistical Package for Social Sciences (SPSS), version 20.0 for windows, IBM Computers, New York, USA.

Results

The mean age of the cohort was 25.5 ± 9.6 years with 82(53.5%) men. The mean body mass index was 29.6 ± 6.4 . The average distance walked in six minute walk test was 387.0 ± 73.8 meters and the average number of steps done on a stepper test in a minute was 28.1 ± 9.2 steps. The average score on PCS of SF-12 questionnaire was 46.3 ± 7.7 and on MCS was 45.8 ± 10.4 . The correlation analysis between the study variables and PCS and MCS, there was no significant correlation between score on MCS and the measured physical fitness variables. However, both distance walked in six minute walk test and performance on stepper test showed significant correlation with PCS. Moreover, age and BMI were not associated either with PCS or with MCS, Table 1.

Table 1: Association between study variables (n=153).

S. No	Variable	Correlation (r) with PCS	Correlation (r) with MCS
1	Age (years)	-0.164	-0.007
2	Distance walked in six minutes (metres)	0.359*	0.01
3	Steps on stepper in one minute	0.281*	0.175
4	Body mass index	-0.06	-0.031

* indicates significant ($p < 0.05$) correlation. PCS = Physical Component Score on SF-12, MCS = Mental Component Score on SF-12.

On evaluating number of PWE with low PCS and MCS scores on SF-12 (Figure 1), a cut off of 50 was utilized. On PCS, 93 (60.7%) scored low on of which 47 (50.5%) were men. Whereas on MCS, 95 (62.0%) scored low, of which 48 (50.6%) were men.

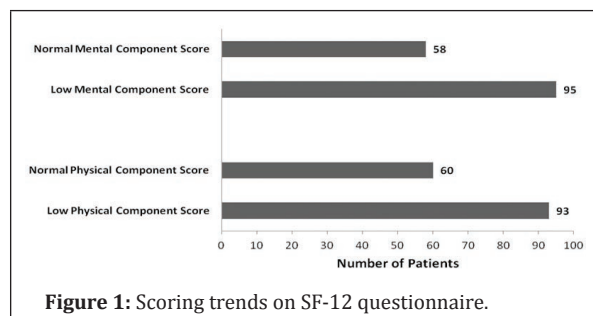


Figure 1: Scoring trends on SF-12 questionnaire.

Discussion

The present study aimed to investigate the association among quality of life and physical fitness levels in people with epilepsy. We report that the PCS score of SF-12 showed a positive association with physical fitness levels showed by PWE in distance walked in six minute walk test and steps taken in one-minute stepper test. However, similar correlations were not observed with MCS scores in the study population. Nearly one-third of PWE in the current study showed low scores on SF-12 and the low scores were equally distributed among genders.

It has been previously suggested that life conditions for PWE may be responsible for higher prevalence of low QOL scores in people with epilepsy [3], this may perhaps be the explanation for our finding that nearly one-third of our study population score low in SF-12. Existing literature shows a linear trend between physical activity and QOL in PWE, since majority of our study population had low scores on PCS, their MCS scores might have been influences.

In the past, several mechanisms have supported the positive changes promoted by physical activity on mental health. These mechanisms included psychological, physiological and neurophysiological. Encouragingly, higher the level of physical activity and has been associated with higher the quality of life by McAuley et al. [22] in a randomized control trial of PWE were lifestyle modification was chosen intervention. The scope of the current study, did not include randomization of patient groups for the data analysis done.

This is the first study in India to evaluate trend for physical fitness levels with mental health in PWE. Although there is a biological plausibility of an association between the physical activity and mental health variables, this cross-sectional study may not be an ideal design to verify the cause and effect relationship. More studies are needed, mainly randomized clinical trials, to establish the cause and effect relationship.

Conclusion

Simple tests like six minute walk test, one-minute stepper test may help to determine physical fitness scores in people with epilepsy. In India, nearly one-third of people with epilepsy have low physical and mental component scores. Although the current study did not show an association between mental and physical fitness scores, further robust trials are required to evaluate the same.

Acknowledgement

The data in obese persons with epilepsy has been done as part of PhD Degree of Dr. Sudhindra Vooturi under Dr. NTR University of Health Sciences, Vijayawada, Andhra Pradesh.

Conflict of interest

Authors declare no conflict of interest.

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