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A Cross Sectional Study to Identify Perceived Barriers and Facilitators to Physical Activity and Exercise Participation of People with Post Stroke Depression

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Abstract

Background: Physical activity and exercises after stroke may prevent the disability and stroke recurrence; yet, psychological impairments like depression may inhibit post stroke exercise and subsequently limit recovery. Though it remains less clear how best is to encourage exercise uptake by individuals with depression after stroke.

Objective: The objective of this study was to identify the perceived barriers and facilitators to physical activity and exercise participation among post stroke depressed individuals.

Methods: Descriptive cross-sectional design was adopted using purposive sampling of stroke survivors. Fifty stroke survivors were screened and identified for depression using HAM-D.25 depressed and 25 non- depressed stroke survivors have been grouped into active and inactive groups based on exercise and physical activity guidelines. IPAQ scale has grouped them into physically active and physically inactive based on 3 METs. Using the EBBS scale, the percentage of positive responses for different domains for benefit and barrier scale was calculated. The significant difference in the percentage of response in barrier and benefit domains was analyzed using Chi-square test.

Results: There was significant difference in percentage of response in each benefit domain of EBBS between depressed and non- depressed active groups. Similarly there was significant difference in percentage of response in each barrier domain of EBBS between depressed and non depressed inactive groups. Ten major perceived barriers were reported in depressed non-active group in which exercising cause fatigue (100%) was the highly reported response.

Conclusion: The study concluded that interventions could be designed for promoting the facilitators more and addressing the barriers to exercise and time management which is likely to reduce the healthcare costs of management of stroke.

Keywords: Barrier, Facilitator, Physical activity, Exercise, Post stroke depression

Introduction

Stroke affects 17 million individuals annually and is the cause of disability globally.[1] Worldwide, stroke is the second leading cause of death and the third

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leading cause of disability.[2] In India, the prevalence of stroke ranged from 44.29 to 559/100,000 persons per year and the incidence of stroke ranged from 105 to 152/100,000 persons per year respectively.[3] Stroke is defined as the sudden death of brain cells due to lack of oxygen when the blood flow to the brain is lost by blockage or rupture of an artery to the brain is a leading cause of dementia and depression.[4]

Residual effects of stroke are the leading cause of chronic physiological and psychological disability which alters an individual's behavior and emotion.[5] Physical disorders in stroke patients usually includes muscle weakness, paralysis, stiffness, pain, spasticity, contractures, foot drop changes in sensation which usually affects one side of the body.[6] The psychological sequelae to stroke includes emotional and behavioral changes and cognitive impairments. Much attention is paid to motor dysfunctions and physical dysfunctions following stroke, but the associated psychological dysfunctions are often ignored. Depression, Apathy, Catastrophic reaction, generalized anxiety disorder, post-traumatic stress reaction, fear of falling and anger are the psychological disorders usually seen in individuals with stroke.[7] Depression is a defined as common mood disorder characterized by persistent sadness and lack of interest or pleasure in any of the activities.[8] Evidence suggests that depression is a modifiable risk factor which is independently associated with stroke morbidity and mortality.[9]

Post stroke depression is complications of stroke.[10] Approximately one third of stroke survivors develop PSD at some point after stroke. The frequency of PSD is highest in the first year, at nearly 1 in 3 stroke survivors, and with an incidence of 55%.[11] It was found that a nearly threefold increased risk in subjects aged 55–64 years, but not in those ≥65 years.[12,13] Lesions in more frontal brain areas and lesions involving the basal ganglia are more prone to lead to PSD. Patients with left hemispheric stroke are also more susceptible for PSD.[14]

PSD has been shown to have a negative impact on the functional impairments and results in higher mortality rates. It has been associated with delayed rehabilitation as well as social withdrawal and poor performance in activities of daily living.[16-19] PSD is also associated with severe disability, anxiety, lower Quality of Life, speech and language dysfunction, anhedonia, feeling of despair, cognitive impairment and lack of medication compliance.[20]

Methodology

Descriptive cross-sectional design was adopted using a purposive sampling of stroke survivors patients. Fifty five stroke survivors were approached to take part in the study of which 5 got excluded (two participants with expressive dysphasia and one with profound deafness, one with severe visual impairments and one was on anti- depressant medications).

Procedure

Fifty participants undertook the screening for depression using HAM-D scale. Twenty five depressed and Non-depressed stroke subjects were identified. Those who met exercise guidelines recommendations were grouped into active and inactive. Participants were then interviewed to obtain information on physical activity using International Physical activity questionnaire (IPAQ) and categorized into physically active and physically inactive based on 3METs. The information on perceived facilitators and barriers was collected by Exercise Barriers and Benefits Survey scale. Percentage of positive (+) response for different domains in barrier and benefit scale was calculated.

Statistical Analysis

Chi-square test was done to analyze the statistical significant difference in the percentage of positive responses. Also the frequency percentage for each items in barrier and benefit scales were calculated to obtain the major barriers and facilitators in depressed stroke survivors.

Results

In the study there was not much difference in the age range of all the subjects in the study. In the study also, females are comparatively less as compared to males (24%). Majority (72%) of the subjects had ischemic stroke. There is no stark difference in the duration of stroke, cognition levels (MMSE) and Depression score range (HAM-D) between the subjects. IPAQ identified 26 active subjects and 24 inactive subjects' based on 3METs. Depressed stroke

survivors were having low physical activity levels, as these subjects spend most of their time sitting/ sleeping. 64% of depressed stroke survivors showed low physical activity levels in the transportation, sports and recreational –related activities. There was a significant difference in the percentage of subject response to benefits between active depressed and non- depressed group ($p<0.05$).There was also significant difference in the percentage of subject response to barriers between inactive depressed and non-depressed stroke survivors ($p<0.05$).

Table 1: Physical activity of study subjects based on IPAQ

S.No.	IPAQ			
		>3METs	<3METs	Total
1.	Non-depressed stroke survivors(n=25)	14	12	26
2.	Depressed stroke survivors (n=25)	12	12	24

Table 2. Percentage of positive subject response for each domain of EBBS-Benefits scales Subscales.

Benefit Domains Of EBBS	NDA=14	DA (N=9)	p value*
	% of Positive Response	% of Positive Response	
1.Psychological Outlook	82	63	.00262
2.Preventive Health	75	59	.01612
3.Physical Performance	70	55	.02846
4.Social Interaction	86	64	.00032
5.Life Enhancement	80	47	.00001

Abbreviation=NDA= Non-depressed active, DA= Depressed active

p<.05* = Significant difference

Abbreviation=NDA= Non-depressed active, DA= Depressed active

Table 3: Percentage of positive subject response for each domain EBBS-Barrier Subscales.

Barrier Domains Of EBBS	NDI (N=11)	DI(N=16)	p-value*
	% of Positive Response(+)	% of Positive Response(+)	
1.Exercise Millieu	23	50	.00007
2.Time Expenditure	24	54	.00001
3.Physical Exertion	80	93	.00714
4.Family Discouragement	32	59	.00012

Abbreviation= NDI= Non-depressed inactive, DI= Depressed inactive

*p<.05 = Significant difference

Table 4: Perceived barriers as per EBBS barrier domains in depressed non-active stroke subjects

Items In Barrier Scale	Frequency of positive response in NDI(n=11)	Frequency of positive response in DI (n=16)
1.EXERCISE MILIEU		
a. Far exercise place	0(0%)	10(63%)
b. Inconvenient facility schedules	5(45%)	5(45%)
c. Few exercise places	0(0%)	9(56%)
d. Embarrassed to exercise	0(0%)	8(50%)
e. Costs to exercise	10((90%)	7(43%)
d. Funny clothes	0(0%)	9(56%)
2.TIME EXPENDITURE		
a. Too much time	7 (64%)	12(75%)
b. Time from family	1(9%)	6(37%)
c. Take time	0(0%)	8(50%)
3.PHYSICAL EXERTION		
a. Exercise is tiring	**9(82%)**	14(88%)
b. Exercise is fatiguing	11(100%)	16(100%)
c. Exercise is hardwork	8(73%)	13(81%)
4.FAMILY ENCOURAGEMENT		
a. No spouse encouragement	2(18%)	9(56%)
b. No family encouragement	5(45%)	10(62%)

Abbreviation= NDI= Non-depressed inactive, DI= Depressed inactive

Discussion

The purpose of this study was to identify the perceived barriers and facilitators to physical activity and exercise participation among post stroke depressed individuals. The findings of this study could inform intervention and resource development addressing behavior change related to exercise and physical activity for individuals with post stroke depression. This study highlights the need for future interventions to explicitly target the barriers to physical activity and exercise in depressed stroke individuals.

In the study, females were comparatively less as compared to males (24%) and 20% of females were depressed. Majority (72%) of the subjects had ischemic stroke. The study found 56% of subjects with mild depression, 32% with moderate depression and 12% with severe depression. There was no stark difference in the duration of stroke, cognition levels (MMSE) and depression score range (HAM-D) between the subjects.

Physical Activity Levels In The Study Subjects

Components Of Physical Activity

The present study used IPAQ scale as the outcome measure to identify the number of subjects who are physically active and physically inactive in depressed and non- depressed population. The findings of this study showed that there were 26 physically active and 24 physically inactive

depressed and non-depressed populations. Findings also showed that non-depressed stroke survivors were mostly moderately active (56%). Job –related activities, house work, maintenance, caring for family, gardening and walking in leisure time were the major contributors to physical activity. 68% of depressed stroke survivors were having low physical activity levels in the transportation , sports and recreational activities-related activities as these subjects spends most of their time watching television, chatting around , sitting/sleeping. In non-depressed inactive and depressed inactive groups, 14% of subjects were active physically because of walking alone.

Perceived Facilitators And Barriers To Exercise And Physical Activity.

In the present study EBBS evaluates the perceived barriers and facilitators to PA and exercise participation in depressed and non- depressed individuals after stroke. There was significant difference in the percentage of subject response to benefits between active depressed and non-depressed group ($p<0.05$).There was also significant difference in the percentage of subject response to barriers between inactive depressed and non-depressed stroke survivors ($p<0.05$).

Perceived Facilitators

The study results show the percentage of subject response for each item under each Benefit Subscales in non-depressed active group and depressed active groups. In general, most respondents either agreed or strongly agreed with most benefit items in the EBBS scale. None of the respondents completely disagreed with any of the benefit statements.

Perceived Barriers

The study results showed the percentage of positive subject response for each domain under each Barrier subscales in non-depressed inactive and depressed inactive subjects. 93% of depressed active subjects have positively responded to the barriers in physical exertion domain of EBBS-barrier scale For example, “Exercise is tiring”, ”Exercise is hard work”, ”Exercise is fatiguing”

Conclusion

This study provides insight into the perceived barriers and facilitators to engagement in physical activity and exercise for adults with post stroke depression. Physical inactivity is a modifiable risk factor for primary and recurrent stroke and increased physical activity after stroke may not only enhance stroke recovery but also may positively affect the health-related quality of life of stroke survivors.

Conflict Of Interest: Nil.

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Ethical Clearance: Ethical committee of The Oxford College of Physiotherapy, Bangalore, Karnataka

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