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Original Article

Exercise Adherence and Factors Affecting Adherence to Home Exercise Program in Patients with Supraspinatus Tendonitis; A Cross-sectional Analytical Study

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ABSTRACT

Background: Adherence has been defined as the act or quality of sticking to something and the least controllable and most unpredictable variables in a medical intervention. In physiotherapy treatment, adherence is dominant to the success of the exercise-based treatment. It has been envisioned that by identifying the barriers to treatment adherence, the caregivers might be able to develop and suggest new methods to enhance and promote adherence to prescribed exercises for patients with supraspinatus tendonitis. **Objective:** To determine the exercise adherence of patients with supraspinatus tendonitis and factors affecting exercise adherence to a home exercise program. **Methods:** Our current study is a cross-sectional analytical study. The data for our study was collected from the Department of Physical Therapy, Bahawalpur Victoria Hospital and Agile Rehabilitation Complex, Bahawalpur, Pakistan. The sample size of our current study was calculated to be 200 by considering a 10% response rate and 90% confidence interval. The data for our study was collected employing the Exercise Adherence Rating Scale. The data was calculated and analyzed by employing a statistical package for social sciences version 23. A correlation was calculated by employing chi-square for adherence. **Results:** The results of our study showed that 91 participants out of 200 had good exercise adherence attributes and 109 participants showed poor exercise adherence which was found out by employing Exercise Adherence Rating Scale. The chi-square test was applied to determine the association between exercise adherence and the factors affecting it. **Conclusion:** Our current study concludes that there are certain factors which affect the exercise adherence to home exercise programs of patients suffering from supraspinatus tendonitis. Improvement in health and physical functioning, self–motivation, encouragement from family and social support from friends and family were recognized as the major factors associated with improved exercise adherence. Fatigue, lack of time and motivation, pain and difficulty in comprehending the exercise program were recognized as the main barriers to adherence to the exercise program.

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INTRODUCTION

Exercise has been recognized as the main backbone of the rehabilitation treatment for Supraspinatus Tendonitis which has been often delivered in class-based settings with home-based exercise programs supporting it.[1] Very much less has been known about the enablers, barriers and motivators of exercise-based treatment plans for supraspinatus tendonitis. More has been known regarding the adherence to exercise generally but not for this group of patients. Our study might work on this gap. Adherence has been defined as the act or the quality of sticking to something.[2] In medicine adherence has been described as the least controllable, most unpredictable variable in the medical intervention.[3] The non-adherence from the exercise has been reported to be associated with ongoing disability either with subsequent or linked with a reduction in the ability to work and loss of salaries.[4] Although numerous studies have focused on highlighting the importance of adherence in securing a fruitful outcome, in the clinical setup, adherence has been often recognized as unpredictable.[3,5] Adherence is not an issue rather it appears to be one of the progressions with some patients adhering to alternating degrees and with altered components of the treatment.[5,6]

There are several studies which have been conducted on exercises in supraspinatus tendonitis, rotator cuff-related shoulder pain, subacromial pain and rotator cuff tendinopathy but those studies which investigate qualitative aspects are lacking.[7-9] Similarly, there is inadequate and limited published information associated with the experiences of the patients who take part in class-based exercise programs and who carry out simultaneous home exercises.[9] In patients with chronic shoulder issues and chronic musculoskeletal pain, it has been proposed that there is an association between exercise adherence and improvements in clinical outcomes.[10-12] A Cochrane review which was conducted on determining the interventions to improve adherence to exercise plans in patients with musculoskeletal pains concluded that personalized exercise therapies and self-management techniques might improve exercise adherence.[13] Moderate quality evidence is available that behavioural change techniques, such as setting a goal, social support, demonstration of behaviour, self-monitoring of the behaviour and graded tasks might improve exercise adherence among patients with chronic musculoskeletal issues.[14,15] Despite this, behavioural frameworks on enhancing adherence to exercise programs have been implemented only on little share in clinical trials focusing on shoulder pain.[16] Our current study had been aimed at exploring factors which might affect adherence to a prescribed home and class-based exercise program in Bahawalpur, Pakistan and to pinpoint the enablers and suggestions for strategies to overcome the identified barriers.

It has been envisioned that by identifying barriers and supporting factors to treatment adherence, caregivers might be able to develop and suggest innovative methods to enhance and improve adherence to the prescribed exercises for patients with supraspinatus tendonitis. Our current aim is to evaluate the factors which impact compliance with home exercise programs among patients suffering from supraspinatus tendonitis. Our study would benefit from learning more about barriers and promoters that influence adherence to a home exercise program. Determining and recognizing the factors that affect adherence would aid in creating awareness among patients regarding the need for adherence and might aid in preventing the recurrence and complications of the illness. Our study would help create awareness on a larger scale too. Our study might also help suggest that healthcare givers customize effective and innovative treatment plans.

METHODS

Our current study is a cross-sectional analytical study. The data for our study was collected from the Department of Physical Therapy,

Bahawalpur Victoria Hospital and Agile Rehabilitation Complex, Bahawalpur, Pakistan. Our current study was completed six months after the approval of its synopsis from the University of Health Sciences, Lahore, Pakistan. The sample size of our current study was calculated to be 200 by considering a 10% response rate and 90% confidence interval.[17] The following formula was employed for calculating the sample size:

$$n = \frac{z^2 \times (1-p)}{\frac{e^2}{1 + \left(z^2 \times (1-p) \right)}}$$
$$e^2 N$$

Where: e is margin of error = 5%, N is population size = 2000 and Z is score. The 200 patients suffering from Supraspinatus Tendonitis were recruited in our study. Non-probability convenient sampling was employed for sampling. Those participants were recruited in our study who were clinically diagnosed with supraspinatus tendinitis, both genders with age groups ranging from 35 to 65 years and participants who reported having positive when performing the empty can test.[18] All those participants were excluded from our study who had subacromial bursitis, adhesive capsulitis, shoulder dislocation, glenohumeral joint and acromioclavicular arthritis, bicipital tendonitis, shoulder fractures and calcific tendonitis.[18]

The data for our study was collected employing the Exercise Adherence Rating Scale. This tool has three domains according to the requirements of the individual. Any domain can be adapted for measurement. Section A consists of six questions that contain the prescribed home exercise programs. Section B consists of six questions that measure adherence and non-adherence to home exercise programs. Section C consists of ten questions that measure the factors which affect adherence. These ten items are associated with reasons why an individual may or may not adhere to the prescribed home exercise.[19] Dependability and test-retest reliability for the Exercise Adherence Rating Scale is strong.[19] The data for our current study was collected from Bahawalpur Victoria Hospital, Agile Institute of Rehabilitation Sciences and Civil Hospital, Bahawalpur, Pakistan. All the participants were informed about the study and its objectives. The objectives of the study were explained to the respondents. All the participants were asked to sign an informed consent in Urdu and English. All the participants who fulfilled the inclusion criteria were included in the study. The questionnaires were distributed to all the participants. All the included participants were given guidance about the questions in the questionnaires in simple language so that responded well and accurately.

The filled questionnaires were collected by the assessor. Participation in our study was voluntary and the privacy of the participants was very well preserved. The data was calculated and analyzed by employing a statistical package for social sciences version 23. The correlation was calculated by employing chi-square for adherence. The calculated data was represented in the form of charts and graphs. All the variables of the questionnaire were entered in the statistical package for social sciences and were presented in the form of frequency, graphs, and charts. All the collected data of the recruited participants was preserved and was only used for research purposes.

RESULTS

In our current study, the age of participants was between 30 to 65 years. Figure I represents the distribution of participants concerning their age. Table I represents the distribution of participants concerning Exercise Adherence Rating Scale scoring. 54.5% of participants showed poor adherence while 45.5% showed good adherence. This represents the response of the participants to the question “I do my exercises as often as recommended”. About 27.5% of participants completely agreed with this. This shows that even in a country like Pakistan participants tend to follow the recommendations given by

Table I: Distribution of Participants Concerning Exercise Adherence Rating Scale Scoring

Exercise Adherence Rating Scale Scoring		Frequency	Percent
Exercise Adherence Rating Scale	Poor Adherence	109	54.5 %
	Good Adherence	91	45.5 %
Satisfaction Level at Doing Exercise	Completely Agree	55	27.5%
	Agree	31	15.5%
	Neutral	12	6.0%
	Disagree	60	30.0%
	Completely Disagree	42	21.0%
Satisfaction Level on Doing Less Exercise	Completely Agree	42	21.0%
	Agree	60	30.0%
	Neutral	10	5.0%
	Disagree	31	15.5%
	Completely Disagree	57	28.5%
Satisfaction Level on Friends and Family Encouragement	Completely Agree	96	48.0%
	Agree	75	37.5%
	Neutral	6	3.0%
	Disagree	12	6.0%
	Completely Disagree	11	5.5%
	Total	**200**	**100.0%**

Table II: Cross tabulation of the Gender and "I don't have time to do my exercises"

Satisfaction Level	Male	Female	Total	Percentage
Completely Agree	56	8	64	32
Agree	24	16	40	20
Neutral	7	2	9	4.5
Disagree	22	3	25	12.5
Completely Disagree	26	36	62	31
Total	**135**	**65**	**200**	**100**

Chi-Square value = 36.39P-value = 0.000 (Significant at 1% level)

Figure I: Graphical Representation of Age of Participants

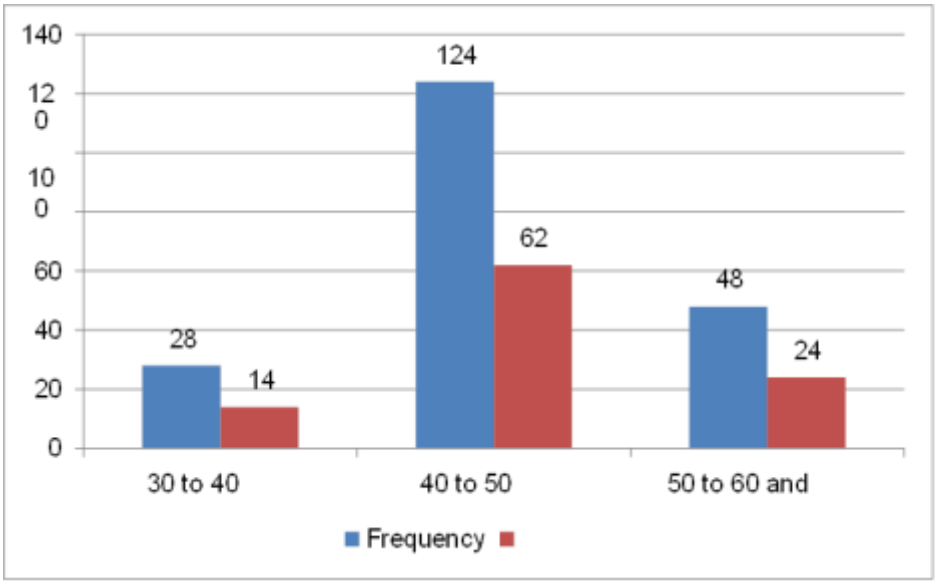
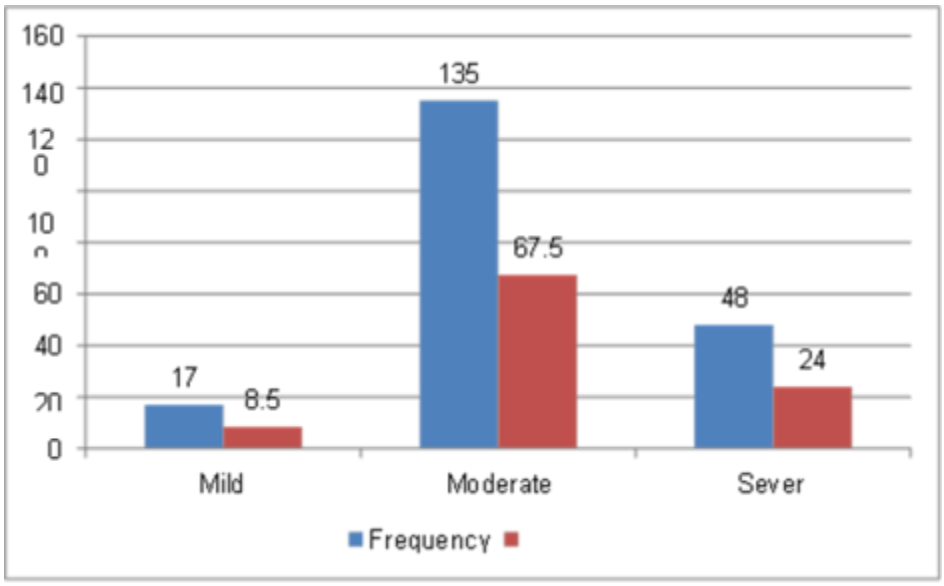


Figure II: Graphical Representation of Scoring of Numeric Pain Rating Scale



the healthcare providers. Table IV represents the response to the question "I do less exercise than recommended by my healthcare professional." Only 21% of participants agreed with this statement. Table V represents the responses of the participants to the question, "My friends and family encourage me to do my exercises." 96 participants strongly agreed with this statement. Table II represents the cross-tabulation of the Gender and "I don't have time to do my exercises." The results showed that males completely agree with this statement as compared to females.

DISCUSSION

Out of 200 participants, 190 reported to have poor adherence to this scale while 91 participants reported to have good adherence. Our study observed that there was poor reporting of adherence and less utilization of physical therapy interventions to promote home-exercise adherence was prevalent. A study conducted by K Hall and co-workers agrees with this observation.[20] Our study and their systemic review both recommend that future researchers and health care providers must include more widespread usage and definitive reporting of the techniques to enhance the promotion of adherence and usage of aims and goals, patient self-reported and physical therapist assessed measure of adherence when prescribing a customized home- exercise plan.[20] Kantheera Areerak and co-workers conducted a systematic review to determine the factors associated with exercise adherence to prevent and treat neck and lower back pain.

Their review proved that the literature which investigated the factors associated with exercise adherence to prevent and treat neck and lower back pain was heterogeneous. Only a few factors were determined to be associated with exercise adherence.[21] Their review and our current study both suggest that further future studies are needed for more reliable conclusions to be made. Caroline Bachmann and co-workers conducted a systematic review focusing on the recommendations for improvements in adherence to home-based exercise. They concluded that adherence to home-based exercises might be increased in a relatively simple manner, through the provision of good support from the caregiver to the patient.[22] Our study completely agrees with this. Their study and our study both conclude that adherence to exercises can also be increased by increasing the self-motivation and self-efficacy of the patient. The results of their review showed that social support given by family members and friends is a very huge key to improve adherence to home-based exercises. Our study completely agrees with this fact. Social support has been also found to play a vital role in improving adherence to treatment in patients suffering from chronic disorders. A study conducted by Garay-Sevilla and co-workers determined that social support appears to be the major determinant of compliance with medical treatment.[23] Their finding coincides with the results of our analysis, in which social support proves to be a strong predictor of adherence to home-based exercises. The results represented that patients who were rigid with their families had very low scores regarding adherence to the treatment. The rigid control might improve the development of conflict with authority and might also increase the denial of the patient for the disease. These findings recommend that social support is very significant for maintaining the treatment.[22]

A study conducted by Schafer and co-workers inspected barriers and factors that support home-based exercises in patients with chronic low back pain. They determined that focusing on patients' perspectives, the major barriers were lack of social support, pain during performing exercises, poor motivation and lack of time to perform the exercises.[24] Our current study strongly agrees with this. Adding to this the major supporting factors included enhanced motivation from the physical therapist, individual goal and social support, education, and the endowment of the exercise sheets. Their results and conclusions are consistent with the findings of our study. One limitation of our study to be considered was that the sample size was not satisfactory. For more generalizable results a larger sample size would have contributed to making more reliable results and evidence. Less education and less comprehension skills among the participants were one more limitation. It was very tiring and difficult to explain to them

about the study, its reason and the questionnaire employed. This entire process was very time-consuming. Even with these efforts still, some participants were reluctant to share their personal information despite being told about the privacy being kept confidential at any cost. Our study recommends future researchers conduct further research on patients with Supraspinatus Tendonitis by employing a larger sample size, a multi-centred and trans-cultural approach also involving the participants across the district to investigate more barriers which create hurdles between the success of home-exercise plans. Besides determining the barriers future studies should also be conducted to find out the motives and aims for home-exercise plans. This might aid in increasing the rate of adherence and effectiveness and efficiency of a customized treatment plan. Our questionnaire was in English only. In keeping with all these circumstances our study recommends that a further study should be conducted to cross this cultural gap and to adapt the Exercise Adherence Rating Scale questionnaire to Urdu Language for its better comprehension and understanding in countries like Pakistan where language is still a communication barrier.

CONCLUSION

Our current study concludes that there are certain factors which affect the exercise adherence to home exercise programs of patients suffering from supraspinatus tendonitis. Improvement in health and physical functioning, self-motivation, encouragement from family and social support from friends and family were recognized as the major factors associated with improved exercise adherence. Fatigue, lack of time and motivation, pain and difficulty in comprehending the exercise program were recognized as the main barriers to adherence to the exercise program.

DECLARATIONS

Consent to participate: Written consent had been taken from patients. All methods were performed following the relevant guidelines and regulations.
Availability of data and material: Data will be available on request. The corresponding author will submit all dataset files.
Competing interests: None
Funding: No funding source is involved.
Authors' contributions: All authors read and approved the final manuscript.

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