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EDITORIAL

TECHNOLOGICAL ADVANCEMENTS IN NEUROREHABILITATION

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It has been a few decades since neurological rehabilitation is recognized as a formal technique for therapeutic treatment of stroke patients or individuals suffering disabilities following spinal cord injuries. Despite the nervous system having a plasticity mechanism that facilitates spontaneous recovery to some extent, it is essential for most patients to receive specialized treatment protocol, to restore their motor function, including physical therapy and occupational therapy. More recently, experts of neurological rehabilitation have inculcated specialized therapies making use of computer and electronic devices to positively influence cortical excitability of damaged parts of cerebral hemispheres in order to improve neuroplasticity.[1] The advancements aim to take advantage of the functionally preserved neuromuscular structures in compensating for the functions of the damaged areas as well as restoring function of the affected brain tissue; something for which the use of technology was not seen being implemented around two decades back.[1, 2]

While traditional approach to neuro-rehabilitation would focus on preventing worsening of a functional limitation through exercises such as passive range of motion and stretching,[2] a better understanding of neuroplasticity has swung the rehabilitation pendulum in favor of use of several electrotherapeutic devices including transcranial magnetic stimulation modality, robot for limb training, robotic lower extremity orthoses and brain-computer interfaces which offer benefits for patients with neuronal injury.[1] Non-invasive brain stimulation facilitates perceptual learning as well motor and cognitive performance in case of brain lesions.[2]

In order to ensure adherence to various therapies in the process of rehabilitation, interactive treatment strategies are being developed. These include the application of virtual and augmented reality systems which not only motivate the patient but make the repetitive exercise interesting in a controlled environment.[3, 4] This approach has challenged the traditional paradigm by the use of biosensors as biofeedback tools to enlighten the patients about internal activities by them visualizing their muscle activity eventually helping them control their bodies better by knowing which muscles to contract to produce the correct movement.[5] A proven successful mode of rehabilitation includes virtual reality (VR) technology, which is practical to use at homes, however, requires professional input when it comes to software development and application. Along with ensuring safety and effectiveness, new strategies are being developed which would allow clinicians who do not hold programming expertise to create game-based VR tasks and make further advancements in the field of neurological rehabilitation.[6]

Amongst the many causes of disability including trauma and musculoskeletal degenerative changes, nervous system disorders are most prevalent resulting in physical, cognitive, linguistic and behavioral issues all at the same time. According to a report by World Health Organization in year 2006, up to 1 billion people are suffering from neurological disorders worldwide constituting around 6% of the global burden of disease and is only escalating since then. Lower-income countries are significantly more affected than high-income countries as 80% disability-stricken individuals live in low-income countries.[7] Considering rehabilitation, particularly the neurological aspect, as being relatively young medical specialty, improvement have been made in the years especially in the developed world with better quality rehabilitation services being offered by multidisciplinary teams consisting of highly trained physicians and physical therapists along with supporting staff.[8]

We are gradually, however, surely moving in the direction of figuring out new and effective approaches to neurorehabilitation by not only compensating for disabilities following neurological injuries but trying to reduce

impairments by restoring neuronal structure and function.[2] The technological advancements made in the developing countries are slow paced; however, keeping in mind the available resources, the responsibility lies with the clinicians to select and provide a comprehensive rehabilitation program which cost-efficient and easy to implement in the long run [9]. In a nutshell, a truly effective neuro-rehabilitative program would focus on strategies to fully enable an individual to carry out activities of daily life, increase mobility, improve the ability to function independently and be an integral part of society.

REFERENCES

1. Gutierrez-Martinez J, Núñez-Gaona MA, Carrillo-Mora P. Technological advances in neurorehabilitation. Revista de Investigación Clínica. 2014;66(S1):8-23
2. Sandin KJ. New Approaches to Neurorehabilitation: The Increasing Evidence Base. Minnesota Medicine. 2012;95(1):46.
3. Borghese NA, Pirovano M, Lanzi PL, Wüest S, de Bruin ED. Computational Intelligence and Game Design for Effective At-Home Stroke Rehabilitation. Games Health J. 2013;2(2):81–88.
4. Lozano-Quilis JA, Gil-Gómez H, Gil-Gómez JA, et al. Virtual rehabilitation for multiple sclerosis using a kinect-based system: randomized controlled trial. JMIR Serious Games. 2014;2(2):e12.
5. Da Gama A, Fallavollita P, Teichrieb V, Navab N. Motor rehabilitation using Kinect: A systematic review. Games Health J. 2015;4(2):123-35
6. Lange B, Koenig S, Chang CY, McConnell E, Suma E, Bolas M et al. Designing informed game-based rehabilitation tasks leveraging advances in virtual reality. Disabil Rehabil. 2012;34(22):1863-70.
7. Khan F, Amatya B, Mannan H, Rathore FA. Neurorehabilitation in developing countries: challenges and the way forward. Phys Med Rehabil Int. 2015;2(9):1070.
8. Barnes MP, Radermacher H. Neurological rehabilitation in the community. J Rehabil Med. 2001;33(6):244-8.
9. Malik AN. Exer-Gaming: A Novel Tool in Stroke Rehabilitation. J Ripha Coll Rehabil Sci. 2015;3(2):48-9.

RESEARCH ARTICLE

EFFECTS OF MULLIGAN AND CYRIAX APPROACH IN PATIENTS WITH SUBACUTE LATERAL EPICONDYLITIS

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ABSTRACT

Objective: To determine and compare the effects of Deep Transverse Friction (DTF) Massage and Mill's manipulation (Cyriax) with Mobilization with movement (MWM) and Taping (Mulligan) in lateral epicondylitis patients. **Material & Methods:** A Randomized Control Trial (NCT03848117) was conducted in Physiotherapy Department of DHQ Hospital Bahawalnagar after the approval from the competent authority. Non-probability convenient sampling technique was used to collect sample. The n=30 sample size was randomly allocated in two groups as Group A i.e. the Cyriax group (DTF Massage & Mill's Manipulation) and Group B i.e. the Mulligan group (Taping & MWM), with 15 participants in each group having sub acute lateral epicondylitis. Data was collected in terms of age, gender, BMI and occupation. Patient related tennis elbow evaluation (PRTEE) questionnaire was used to determine the level of pain, functional disability and hand grip strength. Mann Whitney U statistics test was used for between the group analysis and Friedman with Wilcoxon signed ranks test was used for within the group analysis. The significance level was set at p<0.05. **Results:** The mean±SD age of subjects in Cyriax group was 33.60±6.864 years and in Mulligan group was 36.93±7.741 years. MWM with taping and Mill's manipulation with DTF massage both showed significant improvement (*p<0.001*) in pain, function ability and handgrip strength throughout the treatment duration. When comparing the both group regarding pain, Cyriax approach showed significant improvement after 2nd week while mulligan's approach showed more improvement than Cyriax approach (*p<0.001*) in functional ability from 2ndto 3rd week. Hand grip strength in both groups did not show any significant difference (*p≥0.05*). **Conclusion:** Mobilization with movement& taping (Mulligan) and mill's manipulation with DTF massage (Cyriax), both are effective in improving pain, functional ability and handgrip strength in lateral epicondylitis. Cyriax approach is more effective in relieving pain in lateral epicondylitis as compare to Mulligan's approach. On the other hand, functional ability, more improve with Mulligan's approach. But both treatments are equally effective in improving hand grip strength in lateral epicondylitis.

Keywords: Tennis elbow, mobilization with movement, hand grip strength, patient rated tennis elbow evaluation (PRTEE), Deep Transverse friction massage.

INTRODUCTION

Lateral epicondylitis or tennis elbow is a painful debilitating condition of elbow joint which creates disturbance in functional activities.[1] The basic cause of epicondylitis is the continues continuous strain on the tendon which is attached near to distal segment of humerus.[2] Lateral epicondylitis is sometimes seen in person who had more upper limb activity such as computer use, forceful forearm pronation and supination, heavy weight lifting and repetitive lifting.[3,4] Sub-acute lateral epicondylitis is the most common condition of elbow due to overuse of tendon of forearm muscles in controlled motion phase or sub-acute phase.[5] The prevalence of lateral epicondylitis is 1-3% in any population and incidence is more in above 35-55 years of age as well as in females who are 42-46 years of age.[6,7]

Lateral epicondylitis usually treated by conservative physiotherapy techniques such as acupuncture, ultrasound, electrical stimulations, stretching & strengthening exercises, orthotics, extra corporeal shockwave therapy and laser to improve pain, inflammation, physical fitness and hand grip.[8,9,10,11] The reoccurrence of condition can be prevented by activity modifications, supportive devices or by modifying techniques and equipment. But research evidence regarding specific interventions for sub-acute lateral epicondylitis is poor.[12] Besides conservative management, Mulligan and Cyriax approach are also used for managing lateral epicondylitis. In Mulligan approach, mobilization with movement (MWM) and taping is used for the treatment of tennis elbow. This approach is effective to reduce pain, increase in grip strength above pain free range and increase in the status to tolerate the resisted wrist extension with isometric work.[11,12] The second modern method of lateral epicondylitis treatment is the Cyriax approach and in this method Mill's manipulation is executed instantly after deep transverse friction.[13,14,15]

Both techniques have a role in repositioning of positional faults,[14] controlling the fascia directly, improving muscular recruitment for enhancing static & dynamic neuro-muscular retraining by balancing the tissue length or tension relationship & motor control.[15] Thus helps in reducing pain and improving grip strength and functional disability. Few Researches have done on effectiveness of Cyriax approach (deep transverse friction massage and Mill's manipulation).[16,17,18] This approach collectively augments the blood circulation of the affected area and acts by rupturing the adhesions to elongate the scar tissue, thus helps in achieving the outcomes.[19]

There was enough literature available on traditional therapy for lateral epicondylitis or tennis elbow in Pakistan. But limited evidence was available regarding the use of MWM with taping and deep transverse friction massage with mill's manipulation (Cyriax approach and Mulligan approach) on pain, functional disability and hand grip strength in LE patients. The objective of the study was to determine and compare the effectiveness of Cyriax approach and mulligan approach in improving pain, functional status and hand grip strength in subacute lateral epicondylitis.

METHODOLOGY

A Randomized Control Trial (NCT03848117) was conducted in physiotherapy department of DHQ Hospital Bahawalnagar after the approval from the competent authority from March 2019-November 2019. The inclusion criteria for the recruitment in the study were; participants having sub-acute lateral epicondylitis with age 20-50 years of both genders, pain intensity on visual analogue score VAS>7 with positive mills test, cozens test and local tenderness over lateral epicondyle of the humerus were included. Individuals having elbow joint pathology, history of corticosteroid injection in the preceding 3 months, any other systemic illness like metabolic, metastatic, infective disorders, any other neurological abnormalities and allergies to kinesio tape were excluded from the study.

Total n=39 subjects were evaluated for eligibility through Non-probability convenience sampling technique. The n=30 subjects fulfilled the inclusion criteria and were part of this trial (Figure. 1). The subjects were randomly allocated through lottery method into two groups; Cyriax approach (DTF massage & mill's manipulation) group (n=15) and Mulligan approach (Taping & MWM) group (n=15). Approval of the study was granted by Head of Department, DHQ Hospital Bahawalnagar. Prior to data collection written informed consent was obtained from the participants. The demographic variables such as age, weight, height, occupation, BMI index were obtained then patient related tennis elbow evaluation (PRTEE) pain and functional disability evaluations and hand grip strength by dynamometer through internationally accepted standard chart were completed on the same day. Each subject in both groups completed 12 sessions of Physical therapy in 4 weeks including DTF massage, mill's manipulation, MWM and taping. Each subject was evaluated for changes in symptoms on 0 week, 1st week, 2nd week, 3rd week and 4th week. The detail description of therapeutic protocol in both groups can be seen in table 1.

Each patient in Cyriax group was given 20-minute session. Each session started in sitting position and initially deep transverse friction massage was done at lateral compartment of the elbow joint and immediately after that mill's manipulation at elbow joint with flexion at wrist joint in pronated arm position. Each patient in Mulligan group was given 30 to 40minute session. Each session started in sitting position and it included mobilization with movement which was given in such a way that initially lateral glide at elbow joint was performed and after holding it, asked the patient to make a fist and open the fist. In this way, this procedure is repeated 36 times and after 12 repetitions, a short rest period was given. Taping was applied within 10 minutes after mobilization around the elbow joint over extensor carpi radialis muscles to remove the tape after 48 hours before coming for next session. The detail protocol can be seen in table 1.

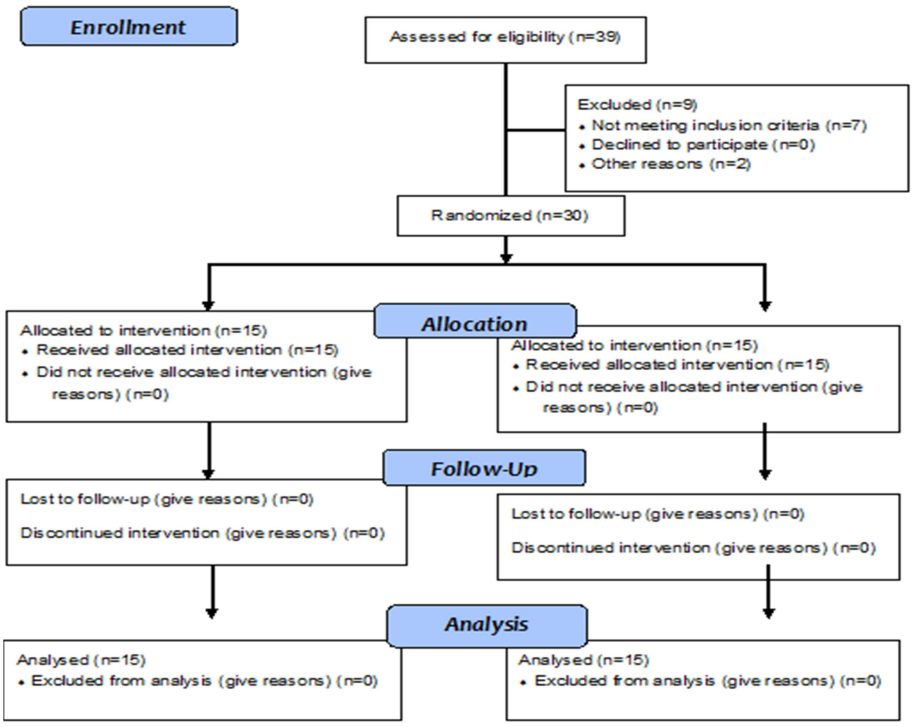


Figure 1: Consort Diagram

Table 1: Intervention Protocol

	Cyriax Approach Deep transverse friction massage and mill's manipulation		**Mulligan Approach Mobilization with movement and taping**	
	Deep Transverse Friction Massage	Mill's manipulation	Mobilization with Movement	Taping
Frequency of sessions	3 times/week	3 times/week	3 times/week	3 times/week
Duration of intervention	10-15 minutes	5 minutes	30 minutes	10 minutes
Repetitions in each session	10-20	1	36	1
Total sessions per month	12	12	12	12

The data was collected through General demographic questionnaire included age, gender, body mass index (BMI), occupation. Patient related tennis elbow evaluation scale (PRTEE index) was used to determine the severity of pain and functional disability. The PRTEE index consists of two main characteristics having fifteen subparts. Each of these characteristics is given a ten point rating scale (0= no pain/ no difficulty in task, 10= worst imaginable pain/unable to do a task). These scores are summed up to make a range from 0=best score to 100= worst score for both pain and function. [20,21] Electronic hand dynamometer of Camry brand, model HGDD-002 reliable tool (r=0.98) was used to determine the hand grip strength. The electronic hand dynamometer is considered the primary clinical measure of hand grip strength according to internationally accepted normal hand grip strength ratings in Kgs in patients with various musculoskeletal conditions associated with decreased hand grip strength.22 The scoring includes max1,max 2 and mean values from standardized hand grip strength evaluation scale according to age of the patient. The results of study were presented as frequency, percentages, mean±SD, median (IQR), z-values, U-stats and p-values. The sample size is too small for normality testing. In case where the sample size is ≤30, non-

parametric tests are chosen. For between-group analysis, Mann Whitney U statistics and Independent t-test were used, while for within-group analysis Friedman with Wilcoxon signed ranks test and RM-ANOVA were used. SPSS 21 was used to analyse the data. The level of significance was set at a p value less than 0.05.

RESULTS

The mean age of participants was 35.27±7.38 and n=19 were male and remaining n=11 were female. The majority of participants have normal BMI (24.25±3.03). Regarding the occupation mostly male are related to computer/desk work (n=5) and female were house wives (n=4). The further detail can be seen in figure 2.

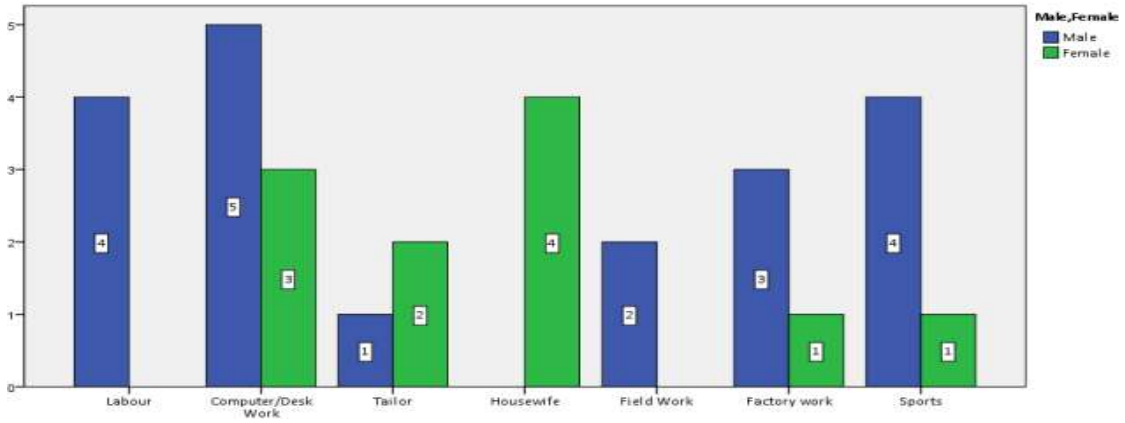


Figure 2: Occupation of Study Participants

In cyriax group as well as in mulligan group, regarding total pain, functional disability and hand grip strength variables, both groups showed significant improvement in overall sessions. (p<0.05) In Cyriax group, from 0 to 4th week results showed significant improvement in pain (34(8) ver. 4(6), p=0.001) and in functional disability (71(20) ver. 14(5), p=0.001) and also in hand grip strength (24.76±6.47 ver. 48.49±9.26, p<0.001). While in mulligan approach, from 0 to 4th week results also showed significant improvement in pain (35(2) ver. 7(2), p=0.001) and in functional disability (77(19) ver. 12(13), p=0.001) and also in hand grip strength (24.69±7.32 ver. 46.31±11.25, p<0.001).(Table 4 & Figure 3)

Table 4: Within-group changes in pain and functional disability

		Cyriax approach			Mulligan approach		
		Median (IQR)	z-score	*p-value*	Median (IQR)	z-score	*p-value*
Pain	0 week	34(8)	-3.413	*0.001* [a]	35(2)	-3.415	*<0.001* [a]
	1st week	23(16)	-3.412	*0.001* [b]	29(6)	-3.415	*<0.001* [b]
	2nd week	12(4)	-3.428	*0.001* [c]	22(10)	-3.411	*<0.001* [c]
	3rd week	9(4)	-3.448	*0.001* [d]	12(3)	-3.420	*<0.001* [d]
	4th week	4(6)	-3.422	*0.001* [e]	7(2)	-3.420	*<0.001* [e]
Functional disability	0 week	71(20)	-3.416	*0.001* [a]	77(19)	-3.418	*<0.001* [a]
	1st week	51(24)	-3.413	*0.001* [b]	57(34)	-3.412	*<0.001* [b]
	2nd week	39(37)	-3.411	*0.001* [c]	28(6)	-3.422	*<0.001* [c]
	3rd week	24(4)	-3.415	*0.001* [d]	19(8)	-3.421	*<0.001* [d]
	4th week	14(5)	-3.412	*0.001* [e]	12(13)	-3.408	*<0.001* [e]

[a]0 week vs. 1st week, [b]1st week vs. 2nd week, [c]2nd week vs. 3rd week, [d]3rd week vs. 4th week, [e]0 week vs. 4th week

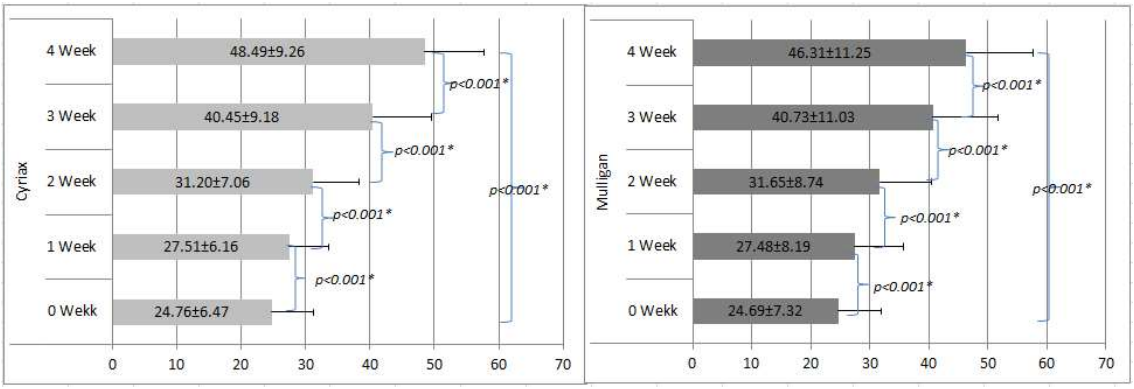


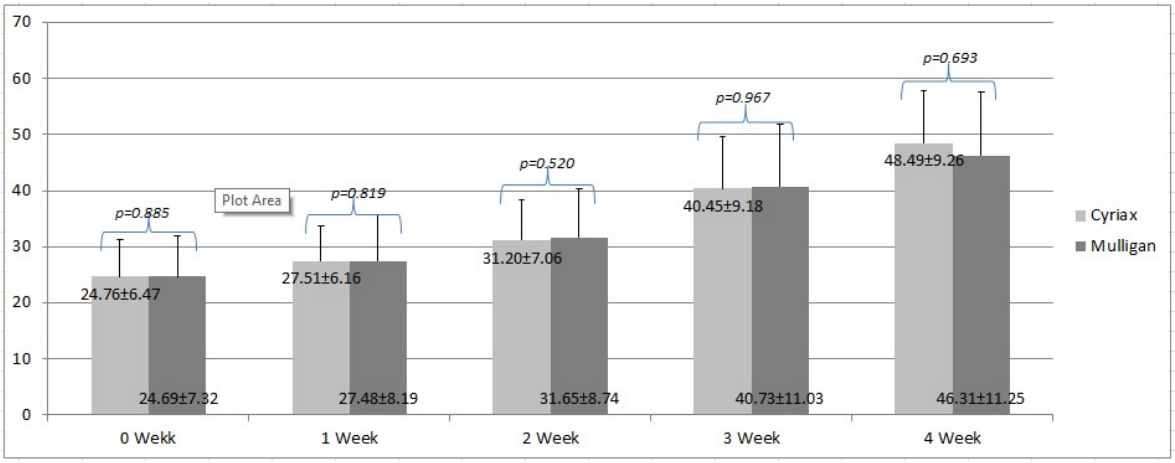
Figure 3: Hand grip strength within the groups

While comparing both groups, there was no significant difference observed between the groups regarding pain and functional disability at 0 week and 1st week. (p≥0.05) (p>0.05) but more regarding functional disability, in 4th week, no significant difference (p>0.05) was found between the groups. (Table 5) For hand grip strength variable, there was no significant difference (p>0.05) found between the groups in all weeks and overall sessions. (Figure 4)

Table 5: Between-group comparison for pain and functional disability

		Cyriax approach Median(IQR)	Mulligan approach Median(IQR)	U-stats	p-value
Pain	0 week	34(8)	35(2)	86.50	0.274
	1st week	23(16)	29(6)	66	0.053
	2nd week	12(4)	22(10)	9.50	<0.001*
	3rd week	9(4)	12(3)	30.50	<0.001*
	4th week	4(6)	7(2)	46	<0.001*
Functional disability	0 week	71(20)	77(19)	108.50	0.868
	1st week	51(24)	57(34)	109.50	0.901
	2nd week	39(37)	28(6)	31.50	<0.001*
	3rd week	24(4)	19(8)	40.50	<0.001*

**Level of significance p≤0.05*



**Level of significance p≤0.05*

Figure 4: Hand grip strength between the groups

DISCUSSION

The objective of the study was to determine and compare the effectiveness of Cyriax approach and mulligan approach in improving pain, functional status and hand grip strength in subacute lateral epicondylitis. It was also hypothesized that Cyriax approach is significantly effective in improving pain, functional disability and hand grip strength than Mulligan's approach in patients with sub-acute lateral epicondylitis. The Cyriax approach significantly improved pain, while functional ability with Mulligan approach improved significantly. Both groups regarding hand grip strength were equally effective.

In Cyriax approach, earlier pain improvement is due to DTF massage which augment vasodilatation and thus blood flow is increased to the area, which caused chemical irritants removal and increased the transport of endogenous opioids and increased destruction of pain provoking waste metabolites.[23,24] Mill's manipulation, given immediately after DTF, intended to stretch the scar tissue within the teno-oseous junction by breaking adhesions, thus the area became mobile and pain free.[25] Two studies from past literature also showed improvement in pain by Cyriax approach and mulligan approach.[26,27] One study was conducted by Madhusmita Koch and his colleagues to find out the effectiveness of Cyriax and eccentric strengthening and stretching exercises. Sample size was sixty n=60 and they found that Cyriax treatment was significantly effective in improving pain and hand grip strength.[26] This study is similar to current study in treatment duration, measuring tools and in results. Bill Vicenzino et al find out the efficacy of Mulligan's MWM in pain relief and to correct positional fault not only in tennis elbow but also in all other musculoskeletal disorders. They noticed the improvement in pain and mobility of the joint.[27] The current study also showed that mulligan approach also has role in improving pain.

According to the results of the current study, mulligan approach was more effective in improving functional status of lateral epicondylitis patients. The mechanism of MWM was that slight positional faults (not readily visible on X-rays) occur due to any injury or strain resulted in movement limitations or pain. But when correctional mobilization is maintained, function is restored without pain and many repetitions will bring long lasting improvements.[14] The reason was that MWM is almost always perpendicular to the plane of movement and hence will work in only one path. When correct MWM is repeated many times, the joint memory to keep on path seems to return back.[28] Taping has been found effective in lessening the pain and restoring the joint function, maintaining and establishes proper structural arrangement by harmonizing the tissue length-tension association sustained for prolonged period. Therapeutic tape not only approximate the elasticity of human skin but also allow the longitudinal stretch to 140% to its resting length.[29,30] Specifically, the tape application to over stretched muscle decreased nociceptive stimulus by creating convolutions in the skin thus to reduce extra pressure in the mechanoreceptors underneath the dermis.[31] That is why mulligan approach overall is very much effective not only in relieving pain as well as immediately in improving functional status.

Past literature also showed the effectiveness of mulligan approach and Cyriax approach individually in improving functional status.[32,33] Amro et al. conducted a study to investigate the effects of conventional treatment alone with the of combination of Mulligan techniques and traditional treatment in patients with lateral epicondylitis. The results showed that the combination of Mulligan techniques with traditional treatment showed significant improvement than conventional treatment alone. They applied the same mulligan approach as in current study included MWM and taping, with similar outcome variables, almost with same sample size i.e. treatment duration of 4 weeks, measuring tools i.e. PRTEE and hand grip strength and also having similar results.[32] Another pilot study conducted by Rajadurai Viswas et al. to compare the efficacy of supervised exercise program and Cyriax approach in the treatment of tennis elbow. This study was carried out with 20 patients. Pain intensity with VAS and functional outcome by Tennis Elbow Function Scale (TEFS) were used. Both approaches were found to be significantly effective in improvement of pain and

functional status.[33] This study goes parallel to the current study in treatment duration i.e. 4 weeks and in the effectiveness of Cyriax physiotherapy.

In current study, both groups showed significant improvement in hand grip strength in overall sessions in all the weeks (*p≤0.05*). Tipton et al. recommended that this technique not only increase and maintain the force being transmitted to ligaments, tendon and bones but also increase the strength and functional ability of these structures.[34] Early mobilization is very much effective on increasing the tensile strength of connective tissue scars in muscle damage and can also augment the number and size of collagen fibrils besides increasing the cross-sectional area of tendons comparatively to tendons of inactive controls.[35,36] Regarding Cyriax approach, Paungmali et al. found similar results with improved pain-free grip, pressure pain threshold, and sympatho-excitation following the application of Cyriax physiotherapy.[37] Different past studies on both approaches showed evidence regarding effect on hand grip strength.[38,39,40,41,42] Such as one past study done by Abott JH et al. to demonstrate a beneficial early response to a manual therapy technique i.e. (MWM) for tennis elbow. The results of the study indicate that MWM was effective in 92% of subjects to be able to perform pain-free functional activities, and also improving grip strength immediately after that.[38] Another study was done by Moneet Kochar and Ankit Dogra on 66 patients who were classified in to three groups to determine the efficacy of different therapy schedules for lateral epicondylitis patients. Four outcomes were Visual analogue score, weight test, isometric grip strength and patient assessment test. The First group (MWM group) showed more improvement in overall outcome variables.[39] Similarly, Hafizur Rahman et al. conducted a randomized control trial to compare the effect of Mulligan mobilization with movement and supervised exercise program and results showed that both techniques showed the improvements in the hand grip strength and pain.[40] One more past study was done by Nagrale et al. on cyriax physiotherapy (DTF massage in combination with Mill's manipulation) in treating lateral epicondylalgia. In this randomized clinical trial, Cyriax physiotherapy was compared with phonophoresis and supervised exercise. Result of the both groups improved significantly from the start of treatment.[11] Another pilot study was done by Shamsoddini et al. to determine the initial effects of taping technique regarding wrist extension, pain and grip strength of hand in tennis elbow patients. Hand-held dynamometer for wrist extension and grip strength and visual analogue scale (VAS) used for pain. Significant changes were found in wrist extension (*p=0.006*) and in grip strength (*p=0.001*) between effected and unaffected arm. Thus Taping technique showed an impressive effect on all outcome variables in individuals with lateral epicondylitis.[41] the current study also showed improvement in hand grip strength.

The results of the study were only applicable for the population of patients visiting DHQ Hospital Bahawalnagar, the data was not evaluated on gender based difference as both male and female has different level of physical activity due to different musculoskeletal strength and participation level and hence effectiveness of interventions on outcomes also varies.[42,43] The sample size was small and treatment duration was less, so long term improvement in functional disability was not observed, limited resources.

CONCLUSION

Mobilization with movement & taping (Mulligan) and mill's manipulation with DTF massage (Cyriax), both are effective in improving pain, functional ability and handgrip strength in lateral epicondylitis. Cyriax approach is more effective in relieving pain in sub-acute lateral epicondylitis as compare to Mulligan's approach. On the other hand, functional ability, more improve with Mulligan's approach. Moreover, Mulligan approach is more effective in improving functional disability than Cyriax approach. But both treatments are equally effective in improving hand grip strength in sub-acute lateral epicondylitis.

REFERENCES

1. Jones VA. Physiotherapy in the management of tennis elbow: a review. Shoulder Elbow. 2009;1(2):108-13.
2. Walz DM, Newman JS, Konin GP, Ross G. Epicondylitis: pathogenesis, imaging, and treatment. Radiographics. 2010;30(1):167-84.

3. Pienimäki T, Tarvainen T, Siira P, Malmivaara A, Vanharanta H. Associations between pain, grip strength, and manual tests in the treatment evaluation of chronic tennis elbow. Clin J Pain. 2002;18(3):164-70.
4. Mahanta V, Dudhamal TS, Gupta SK. Management of tennis elbow by Agnikarma. J Ayurveda Integr Med. 2013;4(1):45.
5. Amro A, Diener I, Bdair WO, Isra'M H, Shalabi AI, Dua'I I. The effects of Mulligan mobilisation with movement and taping techniques on pain, grip strength, and function in patients with lateral epicondylitis. Hong Kong Physiother J. 2010;28(1):19-23.
6. Arirachakaran A, Sukthuayat A, Sisayanarane T, Laoratanavoraphong S, Kanchanatawan W, Kongtharvonskul J. Platelet-rich plasma versus autologous blood versus steroid injection in lateral epicondylitis: systematic review and network meta-analysis. J Orthop Traumatol. 2016;17(2):101-12.
7. Nilsson P, Thom E, Baigi A, Marklund B, Månsson J. A prospective pilot study of a multidisciplinary home training programme for lateral epicondylitis. J. Musculoskelet. Res. 2007;5(1):36-50.
8. Pienimäki TT, Tarvainen TK, Siira PT, Vanharanta H. Progressive strengthening and stretching exercises and ultrasound for chronic lateral epicondylitis. Physiothera. 1996;82(9):522-30.
9. Martinez-Silvestrini JA, Newcomer KL, Gay RE, Schaefer MP, Kortebein P, Arendt KW. Chronic lateral epicondylitis: comparative effectiveness of a home exercise program including stretching alone versus stretching supplemented with eccentric or concentric strengthening. J Hand Ther. 2005;18(4):411-20.
10. Johnson GW, Cadwallader K, Scheffel SB, Epperly TD. Treatment of lateral epicondylitis. Am. Fam. Physician. 2007;76(6).
11. Nagrale AV, Herd CR, Ganvir S, Ramteke G. Cyriax physiotherapy versus phonophoresis with supervised exercise in subjects with lateral epicondylalgia: a randomized clinical trial. J Man Manip Ther. 2009;17(3):171–178.
12. H Labelle, R Guibert, J Joncas, N Newman, M Fallaha, C H Rivard, et al. Lake of scientific Evidence for the treatment of lateral epicondylitis of the elbow:an attempted meta analysis. J Bone Joint Surg Br.1992, 74-B(5):646-651.
13. Vicenzino B, Brooksbank J, Minto J, Offord S, Paungmali A. Initial effects of elbow taping on pain-free grip strength and pressure pain threshold. J Orthop Sports Phys Ther. 2003;33(7):400-7.
14. Mulligan BR. Manual Therapy:" nags"," SNAGS"," MWMS" Etc. Wellington: Plane View Services; 1999.
15. Sharth, U.R., 2005. Combined effect of wrist manipulation and elbow taping in patients with tennis elbow (Doctoral dissertation).
16. Chamberlain GJ. Cyriax's friction massage: a review. J Orthop Sports Phys Ther. 1982;4(1):16-22.
17. Gregory MA, Deane MN, Mars M. Ultrastructural changes in untraumatised rabbit skeletal muscle treated with deep transverse friction. Physiothera. 2003;89(7):408-16.
18. Sevier TL, Wilson JK. Methods utilized in treating lateral epicondylitis. Phys Ther Rev. 2000;5(2):117-24.
19. Stasinopoulos D, Johnson MI. Cyriax physiotherapy for tennis elbow/lateral epicondylitis. Br J of Sports Med. 2004;38(6):675-7.
20. Rompe JD, Overend TJ, MacDermid JC. Validation of the patient-rated tennis elbow evaluation questionnaire. J Hand Ther. 2007;20(1):3-10.
21. MacDermid JC. The Patient-Rated Tennis Elbow Evaluation (PRTEE)© User Manual. 2007
22. Anakwe RE, Huntley JS, McEachan JE. Grip strength and forearm circumference in a healthy population. J Hand Surg Eur. 2007;32(2):203-9.
23. Walker JM. Deep transverse frictions in ligament healing. J Orthop Sports Phys Ther. 1984;6(2):89-94.
24. Goats GC. Massage--the scientific basis of an ancient art: Part 2. Physiological and therapeutic effects. Br J Sports Med. 1994;;28(3):153-6.
25. Herd CR, Meserve BB. A systematic review of the effectiveness of manipulative therapy in treating lateral epicondylalgia. J Man Manip Ther. 2008;16(4):225–237.
26. Koch M, Kamath MS, Chetri B. Efficacy of Cyriax physiotherapy versus eccentric strengthening and stretching exercises in chronic lateral epicondylitis patients. Int J Phys. 2015;2(5):731-7.
27. Vicenzino B, Paungmali A, Teys P. Mulligan's mobilization-with-movement, positional faults and pain relief: current concepts from a critical review of literature. Man Ther. 2007;12(2):98-108.
28. Miller J. Mulligan concept management of tennis elbow. Orthop Div Rev.2000:45-6.
29. Ellis RF. The use and treatment efficacy of kinaesthetic taping for musculoskeletal conditions: a systematic review. N Zealand J Phys. 2010;38(2):56.
30. Moore R. What is the current evidence for the use of kinesiotape. A Literature review. Sport Dyn. 2012;34:24-30.
31. Parreira PD, Costa LD, Takahashi R, Junior LC, da Luz Junior MA, da Silva TM, Costa LO. Kinesio Taping to generate skin convolutions is not better than sham taping for people with chronic non-specific low back pain: a randomised trial. J Phys. 2014;60(2):90-6.
32. Amro A, Diener I, Bdair WO, Isra'M H, Shalabi AI, Dua'I I. The effects of Mulligan mobilisation with movement and taping techniques on pain, grip strength, and function in patients with lateral epicondylitis. Hong Kong Phys J. 2010;28(1):19-23.
33. Viswas R, Ramachandran R, KordeAnantkumar P. Comparison of effectiveness of supervised exercise program and Cyriax physiotherapy in patients with tennis elbow (lateral epicondylitis): a randomized clinical trial. Sci World J. 2012;2012.
34. Tipton, C M, Vailes, A C and Matthes, R D. 'Experimental studies on theinfluences of physical activity on ligaments, tendons and joints: A brief review'. 1987; Act Medi Scandi, 711, 157-168
35. Kannus R, Jozsa L, Renström R, Järvtoen M, Kvist M, Lento M, Oja P, Vuorl I. The effects of training, immobilization and remobilization on musculoskeletal tissue: Scandinav J Med Sci Sports. 1992;2(3):100-18.
36. Geetu M. Lecturer, Grover Deepak Effectiveness of movement with mobilization compared with manipulation of wrist in case of lateral epicondylitis. Ind J Phys Occup Ther–Int J. 2008;2(1):16-25.
37. Paungmali A, O'Leary S, Souvlis T, Vicenzino B. Hypoalgesic and sympathoexcitatory effects of mobilization with movement for lateral epicondylalgia. Phys Ther 2003;83: 374–383
38. Abbott JH, Patla CE, Jensen RH. The initial effects of an elbow mobilization with movement technique on grip strength in subjects with lateral epicondylalgia. Man Ther. 2001;6(3):163-9.
39. Kochar M, Dogra A. Effectiveness of a specific physiotherapy regimen on patients with tennis elbow: clinical study. Phys. 2002;88(6):333-41.
40. Rahman H, Chaturvedi PA, Apparao P, Srithulasi pr. effectiveness of mulligan mobilisation with movement compared to supervised exercise program in subjects with lateral epicondylitis. Int J Physiother Res. 2016;4(2):1394-400.
41. Shamsoddini A, Hollisaz MT, Hafezi R. Initial effect of taping technique on wrist extension and grip strength and pain of Individuals with lateral epicondylitis. Iran Rehabili J. 2010;8(1):24-8.

42. Kumar B, Shaw D. Comparative study on the relative strength of young males and females of Delhi-NCR. Int. J. Phy. Edu. Spo.;2(5):30-5.
43. Kelley GA. Gender differences in the physical activity levels of young African-American adults. J Natio Med Assoc. 1995;87(8):545.

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RESEARCH ARTICLE

PSYCHOLOGICAL HEALTH RELATED QUALITY OF LIFE IN PAKISTANI PHYSICAL THERAPISTS

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ABSTRACT

Objectives: To find quality of life (QOL) related to psychological health and its associated factors in Pakistani physical therapists. **Mathodology:** A cross sectional-analytical study was conducted among Pakistani physical therapists, working in different teaching institutes and hospitals. The sample size was (n=464) qualified physical therapists age between 22-50 years selected through convenient sampling technique. Data was collected through general demographic questionnaire including age, gender qualification, marital status, job type, job nature, financial, family and health issues, job satisfaction, overall satisfaction, and for psychological health WHO Quality of Life (WHO-QOL) was used. Data was analyzed by using SPSS version 21 and the results were presented as mean±SD, frequency (n) and percentages (%) of physical therapist according to their psychological health and p-value and chi-square test was used to identify association between variables. **Results:** The mean age of study participant was 27.02±3.79 and mean psychological health score was 36.49±17.38 that showed that average population of PTs had poor psychological health. The psychological health showed significant association (*p≤0.05*) with gender, nature of job, financial issues, health issues and salary satisfaction. **Conclusion:** The majority of physical therapists have poor psychological health. The male gender, PTs working in both clinical and academic settings, financial issues, family issues their health status and unsatisfied job contribute in poor quality of life related to psychological health.

Keywords: Physical therapist, psychological health, quality of life

INTRODUCTION

Psychological illnesses are among common psychiatric issues globally and depression, anxiety and stress are very common.[1] Psychological health is one of the main domains of quality of life, which is the perception of an individual's life in accordance to one's anticipation, goals and purpose in relation to norms and culture of an organization where one lives.[2]

HR-QoL is multidimensional and dynamic, relatively new concept, and self-reported outcome. It covers all aspects of health including physical, social and role functioning as well as mental health. Healthy peoples can communicate more effectively and having good self-respect, being more creative and enthusiastic to work.[3] The HRQoL is assessed through various tools, by means of especially structured disease specific as well as standardized questionnaires which are validated and reliable. Although, Enormous studies have been conducted to evaluate health related quality of life and to improve it by identifying appropriate treatments in different disease conditions, but there is dearth of literature regarding HRQoL in medical specialists.[4]

Physical therapists being health care professionals have a job to diagnose and treat disorders related to movements, demanding high working hours and physical abilities.[5] Professional burnout, emotional fatigue, low sense of individual achievement, depersonalization, affected proficiency, decrease in quality of patient care, increased therapeutic errors, destroyed relationship, premature retirement, suicidal ideation and substance abuse are common among physical therapists, occupational therapists and physicians due to work overload.[6-9]

A study reported that in physical therapist the excessive work related stress is about 53%.[10] Moderate burnouts and musculoskeletal disorders are associated with high level jobs in physical therapists, resulting in more sickness leaves and health care consults.[11] A study conducted by Liaqat M et al on physical health related to quality of life in Pakistani physical therapist, reported that depression, anxiety and stress significantly associated with poor physical health.[5] This study provides strong basis for the need to assess Quality of life related to psychological health and exploring potential contributing factors. Thus, this study aimed to find out the psychological health related QOL and its associated factors in physical therapists of Pakistan.

METHODOLOGY

The cross sectional-analytical study was conducted among physical therapists of Pakistan working in

various teaching institutes and hospitals. The sample size was n=464 decided by Rao soft sample size calculator with error margin being 5%, which was collected through convenient sampling technique. The Physical therapists those having bachelors and Doctor of physical therapy (DPT) degree, age limit of 22-50 years were included in the study. Whereas, PT technicians/technologists or quacks were excluded from study. The data was collected regarding PTs age, gender, qualification, marital status, job type, job nature, financial and family issues, health status, job and salary satisfaction and overall satisfaction, and psychological health related quality of life was assessed through WHO Quality of Life (WHO-QOL) questionnaire. The questionnaire was also developed on Google form and distributed to Physical therapist through emails. The Informed consent was obtained from the respondents before data collection. Confidentiality and anonymity of study participants was maintained in research. The data was presented in form of frequency, percentages, mean±SD, and p-value. To find association between variable chi-square test was used with alpha level 0.05. SPSS version 21 was used for data analysis.

RESULTS

The results showed that mean age of study participant was 27.02±3.79 and mean score of quality of life related to psychological health was 36.49±17.38 that showed that majority of PTs had poor psychological health. The detail frequency distribution of PTs regarding psychological health can be seen in Figure 1.

The psychological health showed significant association with gender (X^2=11.07, *p=0.020*), nature of job (X^2=28.36, *p<0.001*), financial issues (X^2=9.00, *p<0.001*), family issues (X^2=5.59, *p=0.01*), health issues (X^2=16.84, *p=0.02*) and Job satisfaction (X^2=5.40, p=0.01). The psychological health found poor among Physical therapists those who were divorced (33.63±8.94) and very poor among those working in semi-government setups (33.49±18.22) and those who were not satisfied with their job (34.62±17.20). For detail description of results see table 1.

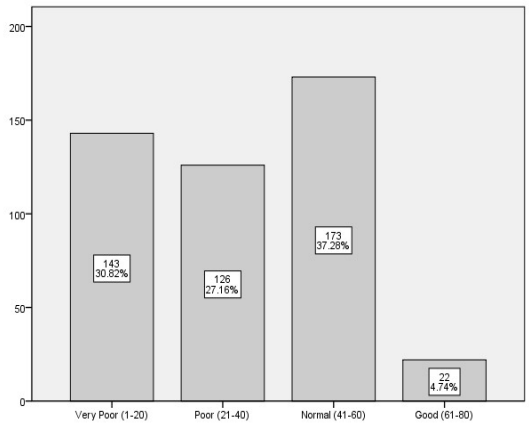

Figure 1: PTs distribution in relation to Psychological Health

DISCUSSION

The objective of the present study was to find out the quality of life related to psychological health and factors affecting it in Pakistani Physical therapist. The key findings suggested that average psychological health in PTs was poor. It was also found that Psychological health was poorly affected in male gender, PTs working in both clinical and academic settings, having financial and family issues, moreover health status and job satisfaction also found to have an impact on psychological health.

Numbers of studies in Asian and western countries have been published assessing the stress, mental health, depression and its related variables in different health care professionals.[12-17] But few studies have been found which addresses the work related stress in qualified physical therapists.[8,10,18]

The key findings of the present study highlighted that about 30.8% PTs reported very poor mental health, which is well supported by a study investigated the mental health among undergraduate physiotherapy students of Sindh, reporting 48% depression, 68.5% anxiety and 53.2% stress in physiotherapist students of Sindh, Pakistan.[1] Although it is evident from previous studies that higher stress, depression and burnout rates are experienced by medical students.[19-23]

Table 1: Psychological Health Related QOL in Physical Therapists

					Psychological Health					
		Mean	**SD**	**N**	***Very Poor (1-20) N %)***	***Poor (21-40) N (%)***	***Normal (41-60) N (%)***	***Good (61-80) N (%)***	X^2	***p-value***
Gender	Male	34.05	±17.14	172	55(32.0)	59(34.3)	49(28.5)	9(5.2)	*11.07*	*0.02**
	Female	37.92	±17.39	292	74(30.6)	54(22.3)	104(43)	10(4.1)		
Qualification	BSPT	33.02	±18.39	49	17(34.7)	14(28.6)	15(30.6)	3(6.1)	*7.68*	*0.14*
	DPT	35.47	±16.93	166	57(34.3)	46(27.7)	53(31.9)	10(6.0)		
	PPDPT/ MS	38.16	±17.44	236	64(27.1)	63(26.7)	100(42.4)	9(43.8)		
	Ph. D candidates	32.08	±16.26	13	5(38.5)	3(23.1)	5(38.5)	-		
Marital status	Married	36.18	±15.81	159	41(25.8)	53(19.2)	65(40.9)	-	*33.46*	*0.84*
	Unmarried	36.25	±18.69	208	79(38.0)	40(19.2)	72(34.6)	17(8.2)		
	In a relationship	37.82	±17.58	89	23(25.8)	28(31.5)	33(37.1)	5(5.6)		
	Divorced	33.63	±8.94	08	-	5(62.5)	3(37.5)	-		
Job nature	Clinical	37.59	±18.59	200	66(33.0)	36(18.0)	84(42.0)	14(7.0)	*28.59*	*<0.001***
	Academic	38.73	±15.89	141	32(22.7)	46(32.6)	55(39.0)	8(5.7)		
	Both	32.11	±16.29	123	45(36.6)	44(35.8)	34(27.6)	-		
Job status	Government	36.18	±18.86	97	33(34.0)	23(23.7)	33(34.0)	8(8.2)	*15.03*	*0.37*
	Semi government	33.49	±18.22	75	33(44.0)	15(20.0)	25(33.3)	2(2.7)		
	Private	37.17	±16.50	245	66(26.9)	76(31.0)	93(38.0)	10(4.1)		
	Self employed	38.29	±17.26	47	11(23.4)	12(25.5)	22(46.8)	2(4.3)		
Financial Issues	Yes	38.56	±17.53	275	75(27.3)	69(25.1)	117(42.5)	14(5.1)	*9.00*	*<0.001***
	No	33.46	±16.74	189	68(36.0)	57(30.2)	56(29.6)	8(4.2)		
Family Issues	Yes	39.46	±17.05	142	38(26.8)	33(23.2)	64(45.1)	7(4.9)	*5.59*	*0.01**
	No	35.17	±17.39	322	105(32.6)	93(28.9)	109(33.9)	15(4.7)		
Health issues	Yes	39.54	±15.99	134	28(20.9)	39(29.1)	65(48.5)	2(1.5)	*16.84*	*0.02**
	No	35.24	±17.79	330	115(34.8)	87(26.4)	108(32.7)	20(6.1)		
Job satisfaction	Yes	38.84	±17.35	205	53(25.9)	55(26.8)	86(42.0)	11(5.4)	*5.40*	*0.01**
	No	34.62	±17.20	259	90(34.7)	71(27.4)	87(33.6)	11(4.2)		
Salary satisfaction	Yes	38.01	±16.19	129	30(23.3)	42(32.6)	55(42.6)	2(1.6)	*10.45*	*0.24*
	No	35.89	±17.79	335	113(33.7)	84(25.1)	118(35.2)	20(6.0)		
Overall satisfaction	Satisfied	34.91	±17.00	83	26(31.3)	28(33.7)	25(30.1)	4(4.8)	*4.71*	*0.64*
	Average	37.09	±17.65	173	50(28.9)	48(27.7)	65(37.6)	10(5.8)		
	Not satisfied	36.61	±17.34	208	67(32.2)	50(24.0)	83(39.9)	8(3.8)		

Level of significance: p≤0.05, P<0.001***

Gender showed significant association with psychological health related quality of life. The male showed poor psychological health related QoL as compare to female. The findings reported by marc A et al. in their study oppose the findings of current study that female gender, young age and high job demands are at higher risk for turnover and job strains.18 Moreover, A study reported that job related burnout is more prevalent in women physicians,[24] which contradicts findings of present study, but according to the literature found that working men of Pakistan experiences gender role strain as their role is being the head of the family, to act as gentle man in the society and to adopt the profession.[25] This might be the reason Pakistani male physical therapist experiences more mental issues then female PTs as they has to obey above mentioned roles.

The current study showed that Job nature of PTs is significantly associated with psychological health. Physical therapist working in both clinical and academic setting showed poor psychological health related QoL than PTs working in clinical or academic setting, which is evident by previous study that high level of job strain is experienced by physical therapists.[18] This issue is difficult to address due to interviews and group studies emphasis. However, it is evident that doctors are at greater risk of stress-related problems and psychological illness, therefore, are more vulnerable to substance abuse.[26,27] Psychiatric illness experienced by doctors is reported about 3 - 10% among all other health related illnesses. Surprisingly it is sad to report that medical professionals go through one or more of "the three Ds" depression, drugs and drink.[28] While, in present study 22.7% and 32.6% PTs were those

working only on academic side had very poor and poor psychological health, respectively, as mental health is affected more in those working on academic side.[5] Among 33% and 18% clinicians had very poor and poor psychological health respectively. Medical professionals may have good physical but poor psychological health, which may decrease their ability to provide proper care to their patients.[29,30]

Financial issue among PTs also showed significant association with poor psychological health. Previously a study conducted among physical therapist of Poland regarding life satisfaction and burnout related to their work revealed that financial issues among females and lack of free time among male physiotherapist induces work related burnout.[31] Furthermore, it is reported in a study that economic recession and financial crisis leads to psychological health issues, suicide and depressions, requiring mental health services.[32,33] In Pakistan Physical therapist salary starting is about 26,000 PKR per month, and may range to PKR 190,000 per month as per experience and qualification based increments. The financial crisis in Pakistan may lead physical therapist to be mentally disturbed for their basic needs and satisfaction. This might be the reason that current study reported about 33.7% PTs were not satisfied with their salary had very poor mental health.

Present study disclosed that family issues have significant impact on psychological health, similarly reported in a study conducted among chines doctor reported that work-family conflict was highly associated with work related stressors.[34] Similarly study reported that work family conflict among patient care workers may lead to psychological distress and sleep insufficiency and it may have negative impact on person's quality of life.[35,36]

The current study showed health issues also showed significant association with poor psychological health. A study conducted by Liaqat M et al reported poor physical health contributes to mental health issues such as depression, stress and anxiety.[5]

The present study demonstrated that 34.5% PTs who were not satisfied with their job reported very poor mental health, which may be associated with prolong working hours, physical and mental exertions, and feel they are overworked, similar findings are reported by HGB Speakman et al in their study.[37] Neil D et al reported that the excessive work related stress called as burnout, is evident in physical therapists[10]. A previous study revealed that PTs stated that their job is stressful, 13.8% were those worked in public center and 25.5% working in private sector have work related burnout.[38] Furthermore, higher suicidal rate is reported in doctors as compared to general population.[30,39,40]

The present study demonstrated that, 44% PTs employed in semi-government institutes were having poor mental health. Stress, psychiatric morbidities, illness and high suicidal rates were reported by previous studies in doctors associating with greater BMI, alcohol use and prevalent smoking.[41,42]

The current study lack the identification of comorbidities and effect of mental issues on performances of physical therapist and relation of mental health with working years.

CONCLUSION

Majority of physical therapists had poor psychological health. Psychological health was found to have significant association with female gender, health status, financial and family issues, and job satisfaction. Psychological health is affected by increased workload, especially in those working in both clinical and academic setups. In future studies can be performed in larger sample size.

REFERENCES

1. Syed A, Ali SS, Khan M. Frequency of depression, anxiety and stress among the undergraduate physiotherapy students. Pak. J. Med. Sci. 2018;34(2):468.
2. Group W. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. Soc. Ssi. & Med. 1995;41(10):1403-9.
3. Ahmad AB. Pengaruh karakteristik demografi dan iklim organisasi terhadap quality of work life (qwl) dosen politeknik kesehatan banjarmasin. J. Waw. Manaj.. 2015;3(3):229-42.
4. Kotlo A, Maram A, Muragundi PM, Janodia M, Ligade V. Health Related Quality of Life among Medical Representatives. J. Young Pharmacists. 2016;8(1).
5. Liaqat M, Kanwal R, Munir S. Physical health related quality of life in pakistani physical therapists. T. Rehab. J. 2018;2(02).
6. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. Arch. inter. Med. 2012;172(18):1377-85.

7. Scutter S, Goold M. Burnout in recently qualified physiotherapists in South Australia. Aus J Phys Ther. 1995;41(2):115-8.
8. Balogun JA, Titiloye V, Balogun A, Oyeyemi A, Katz J. Prevalence and determinants of burnout among physical and occupational therapists. J Allied Health. 2002;31(3):131-9.
9. Pustułka-Piwnik U, Ryn ZJ, Krzywoszański Ł, Stożek J. Burnout syndrome in physical therapists-demographic and organizational factors. Med Pr. 2014;65(4):453-62.
10. Schuster ND, Nelson DL, Quisling C. Burnout among physical therapists. Phys Ther. 1984;64(3):299-303.
11. Cromie JE, Robertson VJ, Best MO. Work-related musculoskeletal disorders in physical therapists: prevalence, severity, risks, and responses. Phys Ther. 2000;80(4):336-51.
12. Grover S, Sahoo S, Bhalla A, Avasthi A. Psychological problems and burnout among medical professionals of a tertiary care hospital of North India: A cross-sectional study. Ind J Psych. 2018;60(2):175.
13. Low ZX, Yeo KA, Sharma VK, Leung GK, McIntyre RS, Guerrero A, et al. Prevalence of burnout in medical and surgical residents: a meta-analysis. Int J Environ Res Public Health. 2019;16(9):1479.
14. Liu Y, Zhang J, Hennessy DA, Zhao S, Ji H. Psychological strains, depressive symptoms, and suicidal ideation among medical and non-medical staff in urban china. J Affect Disord. 2019;245:22-7.
15. Maharaj S, Lees T, Lal S. Prevalence and risk factors of depression, anxiety, and stress in a cohort of Australian nurses. Int J Environ Res Public Health. 2019;16(1):61.
16. Martin F, Poyen D, Bouderlique E, Gouvernet J, Rivet B, Disdier P, et al. Depression and burnout in hospital health care professionals. Int J Occup Environ Health. 1997;3(3):204-9.
17. Kaviani H, Khaghanizade M. The relationship between burnout and mental health among nurses. Tehran Uni Med J. TUMS Publications. 2007;65(6):65-75.
18. Campo MA, Weiser S, Koenig KL. Job strain in physical therapists. Phys Ther. 2009;89(9):946-56.
19. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Med Educ. 2005;39(6):594-604.
20. Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. Med Educ. 200;35(1):12-7.
21. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. Acad Med. 2006;81(4):354-73.
22. Darragh AR, Huddleston W, King P. Work-related musculoskeletal injuries and disorders among occupational and physical therapists. Am J Occup Ther. 2009;63(3):351-62.
23. Volpe U, Ventriglio A, Bellomo A, Kadhum M, Lewis T, Molodynski A, et al. Mental health and wellbeing among Italian medical students: A descriptive study. Int Rev Psychiatry. 2019;31(7-8):569-73.
24. Templeton K, Bernstein CA, Sukhera J, Nora LM, Newman C, Burstin H, et al. Gender-Based Differences in Burnout: Issues Faced by Women Physicians. NAM Perspectives. 2019.
25. Adil, F., Shahed, S., & Arshad, H. (2017). The burden of being a man in a patriarchal society. J Arts Socia Sci, 4(2), 57-70.
26. Vieira ER, Svoboda S, Belniak A, Brunt D, Rose-St Prix C, Roberts L, et al. Work-related musculoskeletal disorders among physical therapists: an online survey. Disabili Rehabili. 2016;38(6):552-7.
27. Wilhelmus Johannes Andreas G, Wernstedt P, Campo M. Work-related musculoskeletal disorders in female Swedish physical therapists with more than 15 years of job experience: prevalence and associations with work exposures. Physiother Theory Pract. 2011;27(3):213-22.
28. Kay MP, Mitchell GK, Del Mar CB. Doctors do not adequately look after their own physical health. Med J Aust. 2004;181(7):368-70.
29. S Su JA, Weng HH, Tsang HY, JL Wu. Mental health and quality of life among doctors, nurses and other hospitals staff. Stress Med. 2009;35(5):423–30.
30. Pilowski L, O'Sullivan G. Mental illness in doctors. BMJ: Br. Med. J. 1989;298(6669):269.
31. Śliwiński Z, Starczyńska M, Kotela I, Kowalski T, Kryś-Noszczyk K, Lietz-Kijak D, et al. Life satisfaction and risk of burnout among men and women working as physiotherapists. Int J Occup Med Environ Health. 2014;27(3):400-12.
32. Shrivastava A, Lodha P, De Sousa A, Singh N. Economic Recession and Mental Health: An Analysis. Adv Psychia. 2019; 679-95.
33. Simpson LA, Grant L. Sources and magnitude of job stress among physicians. J Behav Med. 1991;14(1):27-42.
34. Wang Y, Liu L, Wang J, Wang L. Work-family conflict and burnout among Chinese doctors: the mediating role of psychological capital. J Occup Health. 2012;54(3):232-40.
35. Jacobsen HB, Reme SE, Sembajwe G, Hopcia K, Stoddard AM, Kenwood C, et al. Work-family conflict, psychological distress, and sleep deficiency among patient care workers. Workplace Health Saf. 2014;62(7):282-91.
36. Higgins CA, Duxbury LE, Irving RH. Work-family conflict in the dual-career family. Organi Behav Human Decisi Process. 1992;51(1):51-75.
37. Speakman HG, Pleasant JM, Sutton GB. The job satisfaction of physical therapists. Phys Res Int. 1996;1(4):247-54.
38. Pavlakis A, Raftopoulos V, Theodorou M. Burnout syndrome in Cypriot physiotherapists: a national survey. BMC Health Serv Res. 2010;10(1):63.
39. Tyssen R, Vaglum P. Mental health problems among young doctors: an updated review of prospective studies. Harvard Rev Psychi. 2002;10(3):154-65.
40. Elliot L, Tan J, Norris S. Themental Health of Doctors: A Systematic Literature Review: Beyond Blue; 2010.
41. Bansal R, Katyal R, Haji SA, Kumari R. Self-reported health, illness and self-care among doctors of Meerut. Indian J Commun Health. 2012;24(1):23-6.
42. Riley GJ. Understanding the stresses and strains of being a doctor. Med J Aus. 2004;181(7):350-3.

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RESEARCH ARTICLE

PREVALENCE AND RISK FACTORS ASSOCIATED WITH CONSTIPATION CEREBRAL PALSY CHILDREN IN PAKISTAN

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ABSTRACT

Objective: To find prevalence of constipation and associated risk factors among cerebral palsy. **Material & Methods:** The Cross sectional and case control study was conducted in physiotherapy department of National Institute of Rehabilitation Medicine Islamabad (NIRM) after approval from director of NIRM. The inclusion criteria were CP children with age between 2-12 years and Children with any other systemic co morbidities, physical deformity in GIT, intellectual disability and recent traumatic brain injury were excluded. A total of n=170 subjects fulfilled the inclusion criteria and were part of the study. The data was collected in term of age, gender, body mass index (BMI), types of CP children, fluid, fiber and calories intake. Spasticity and functional independence were also measured through *Modified Ashworth scale (MAS) and* Gross Motor Function Classification System (GMFCS) respectively. The constipation in CP children was measure through defecation frequency. *Defecation frequency* measured less than three times a week was considered constipation and Constipation assessment scale (CAS). The data was described in the form of frequency, percentage, mean, standard deviation, correlation, chi-square and p-value. **Results**: The results showed that all characteristics including age, spasticity, functional independence, fluid intake, calories intake, fiber intake, physiological and topographical type of CP children showed significant association ($p<0.05$) with defecation frequency and constipation severity except BMI and gender ($p\geq0.05$). **Conclusion**: Constipation is highly prevalent in cerebral palsy. The early age, increased spasticity, decreased functional independence related to increased constipation CP children. It was also concluded that low fluid, calories and fiber intake were also contributing factor in development of constipation. The children with spastic cerebral palsy and quadriplegia are more related to constipation than other kind of cerebral palsy.

Keywords: Cerebral palsy, constipation, constipation severity scale, defecation frequency, modified ashworth scale, gross motor functional classification scale.

INTRODUCTION

Cerebral palsy is a permanent non-progressive disorder of developing (immature) brain manifested by impairment in movement and posture that result in activity limitation. [1, 2] Prevalence of cerebral palsy is about 2/1000.[2-4] There are many co morbidities associated with cerebral palsy that include hearing impairment, visual deficit, epilepsy, feeding disorders.[5-7] Constipation is one of the most common gastrointestinal impairment in neurological diseases including CP.[8, 9] It is defined as two or fewer bowel movements per week.[10, 11] It can also be defined as irregular or hard stool and more pressure during defecation, taking more time to defecate and feeling of incomplete defecation. Its prevalence ranges from 26% to 62% in CP child while in normal children its prevalence is about 0.3%-37%.[12] Reasons of constipation in children with CP embrace lack of mobility, increased muscular tone, and malnutrition due to less intake of food secondary to feeding abnormalities.[12-14] The normal functioning of gastro-intestinal tract required co-ordination between autonomic nervous system, enteric nervous system and central nervous system. The process of defecation takes place as a result of rhythmic relaxation and contraction of various muscles of gastrointestinal tract. This coordinated action of GIT muscles become impaired in neurological disorders like cerebral palsy. Hyper stimulation of PNS results in decreased intestinal motility that consequently increases colonic transit time and ultimately constipation occurs. In cerebral palsy, the reason for decreased movement of gut is because of spasticity.[15]

The constipation may become worsen because of severity of the disease, usage of medicines for decreasing the muscle tone and controlling fits, mental retardation and immobility. QOL of these children is affected by constipation and make them socially restricted.[16-18]

Constipation in these children can be treated by many ways. Many medicines are used for preventing and treating constipation in children with cerebral palsy. Drug laxatives are most commonly used that act by increasing intestinal motility.[19] Fiber intake along with fluid intake is more effective in treating constipation than fiber alone.[20] Physical therapy including stretching exercises also plays an important role in management of constipation among CP child. Stretching exercises are performed for decreasing muscle tone in spastic cerebral palsy.[13, 21] In the literature there is limited evidence available on risk factors of constipation in children with cerebral palsy. After having knowledge about these risk factors, it is possible to avoid them and make CP children free from constipation in order to

enhance quality of their lives. So the purpose of this study was to find prevalence of constipation and its associated risk factors among cerebral palsy.

MATERIALS AND METHODS

The Cross sectional and case control study was conducted in physiotherapy department of National Institute of Rehabilitation Medicine Islamabad (NIRM) after approval from director of NIRM. The inclusion criteria were CP children with age between 2-12 years and Children with any other systemic co morbidities, physical deformity in GIT, intellectual disability and recent traumatic brain injury were excluded.

A total n=233 subjects were evaluated for eligibility and n=63 subjects were excluded from the study due to not meeting inclusion criteria. A total of n=170 subjects fulfilled the inclusion criteria and were part of the study. The approval of the study was granted by Director National Institute of Rehabilitation Medicine (NIRM) Islamabad. Prior to data collection written informed consent was obtained from the parents of CP children.

The data was collected in term of age, gender, body mass index (BMI), types of CP children, fluid, fiber and calories intake. Spasticity and functional independence were also measured through *Modified Ashworth scale (MAS) and* Gross Motor Function Classification System (GMFCS) respectively. The constipation in CP children was measure through defecation frequency. *Defecation frequency* measured less than three times a week was considered constipation and measured by nominal scale 1= twice a month, 2= once a week, 3= twice a week and 4= daily. Constipation severity was measured with 8 items Constipation assessment scale (0-16 scale, 0=no constipation, 1-8=some, 9-16= severe constipation). The constipation was diagnosed on the basis of both defection frequency and constipation severity on constipation assessment scale. The data was described in the form of frequency, percentage, mean, standard deviation, correlation, chi-square and p-value.

RESULTS

The mean±SD age of subjects was 63.7±31.58 months, height was 107.5±25.79 cm, weight was 17.07±7.89 kg and BMI was 14.35±2.99 kg/$m^{2.}$ The mean±SD spasticity of upper extremity on modified Ashworth scale (MAS) was 0.51± 0.66, spasticity of lower extremity on modified Ashworth scale (MAS) was 1.56 ± 0.788 and functional independence on gross motor function classification system (GMFCS) was 3.27 ±1.44. Total number of male and female were n=107(62.94%) and n=63(37.06%) respectively. The frequency of constipation in CP children was n=69(40.59%). Figure 1

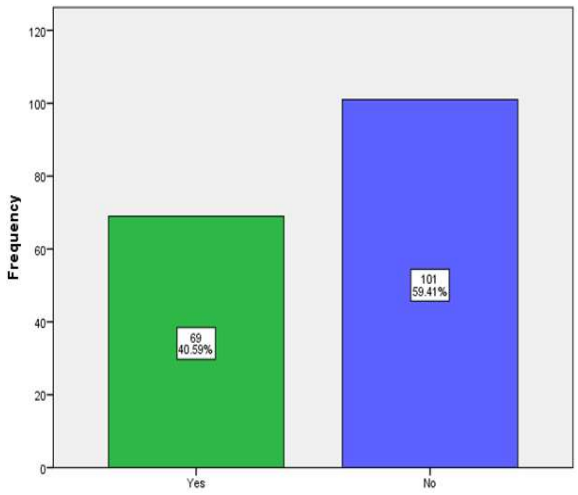

Figure 1: Frequency of Constipation CP children.

The results showed that all characteristics including age, spasticity, functional independence, fluid intake, calories intake, fiber intake, physiological and topographical type of CP children showed significant association (*p<0.05*) with defecation frequency and constipation severity except BMI and gender (*p≥0.05*).The detail of association between basic characteristics of study participant with constipation can be seen in table 1&2.

Table 1: correlation between quantitative variables

		Defecation Frequency (3.15±1.2)		*Constipation severity - CAS(1.88±2.60)*	
		r	***p-value***	***r***	***p-value***
Age (months)	63.7±31.58	0.199	*0.009*	-0.270	*<0.001**
Body Mass Index (kg/m2)	14.35±2.99	-0.085	*0.271*	0.133	*0.084*
Modified Ashworth Scale for Spasticity (UL)	0.51± 0.66	-0.522	*<0.001*	0.530	*<0.001**
Modified Ashworth Scale for Spasticity (LL)	1.56 ± 0.788	-.354	*<0.001*	0.327	*<0.001**
GMFCS	3.27 ±1.44	-0.546	*<0.001*	0.557	*<0.001**
Fluid Intake (ml)	702.9±267.64	0.326	*<0.001*	-0.307	*<0.001**
Calories Intake (Kcal)	562.52±222.45	0.100	*0.193*	-0.206	*0.007**
Fibre Intake (gm)	8.37±5.5	0.159	*0.039*	-0.228	*0.003**

**Level of significance <0.001*

Table 2: correlation between qualitative variables

		Defecation Frequency						Constipation Severity (CAS)				
		Twice a Month	Once a week	Twice a week	Daily	X^2	*p-value*	None (0)	Some (1-8)	Severe (9-16)	X^2	*p-value*
Gender	Male	12(7.1)	26(15.3)	2(1.2)	67(39.4)	5.24	*0.155*	67(39.4)	39(22.9)	1(0.6)	1.43	*0.488*
	Female	6(3.5)	15(8.8)	6(3.5)	36(21.2)			36(21.2)	25(14.7)	2(1.2)		
Type of CP	Spastic	17(10)	38(22.4)	5(2.9)	89(52.4)	29.83	*<0.001**	89(52.4)	59(34.7)	1(0.6)	50.54	*<0.001**
	Ataxic	0(0)	1(0.6)	0(0)	12(7.1)			12(7.1)	1(0.6)	0(0)		
	Dyskinetic	0(0)	2(1.2)	2(1.2)	1(0.6)			1(0.6)	2(1.2)	2(1.2)		
	Mixed	1(0.6)	0(0)	1(0.6)	1(0.6)			1(0.6)	2(1.2)	0(0)		
Type of CP (Topographic)	Diplegia	10(10.6)	13(13.8)	2(2.1)	69(73.4)	35.55	*<0.001**	69(73.4)	25(26.6)	0(0)	29.87	*<0.001**
	Hemiplegia	2(11.8)	0(0)	1(12.5)	14(82.4)			14(82.4)	3(1.6)	0(0)		
	Quadriplegia	6(10.2)	28(47.4)	5(8.5)	20(33.9)			20(33.9)	36(61)	3(5.1)		

**Level of significance <0.001*

DISCUSSION

The primary objective was to find prevalence of constipation and associated risk factors among cerebral palsy. The study showed that prevalence of constipation was about 40.59% among all types of cerebral palsy children. According to a previous study, 74% children with CP were having constipation and most of them were quadriplegic. [22] The frequency of defecation was about 1 in 10 days in children with cerebral palsy which was lower than the frequency among normal children which was 3-4 days in a week.[18]

In current study, in gender vice comparison, prevalence of constipation was 39.3% in males while in females it was about 42.9%, but the effect of gender in prevalence of constipation was insignificant (*p≥0.05*). Similar study was conducted by Mustafa Inan et al in which he found factors associated with childhood constipation in normal population. The prevalence was found to be 7.2% with no significant difference (*p<0.05*) between males (7.3%) and females (7.2%).[23] The reason for this big difference is because in normal population the activity level, dietary intake, fluid intakes, muscular tone, coordination between voluntary and involuntary muscles of defecation were normal.

In current study, age was found to be positively associated (r=0.199, P<0.05) with defecation frequency and negatively associated (r=-0.270, P<0.05) with constipation severity. Similar study was conducted by Rebekka Veugelers et al which showed insignificant association of age and constipation. Decreased activity level and inadequate intake of fiber and fluid contributes in higher prevalence of constipation during early age.[22]

62 out of 150(41.3%) spastic CP child, 1 out of 13(7.7%) ataxic, 4 out of 5 (80%) dyskinetic while 2 out of 2(100%) mixed CP had constipation. Topographically, prevalence of constipation among quadriplegics was about 67.8% while among diplegics and hemiplegics it was 27.7% and 17.6% respectively. As the defecation frequency is affected by exercises,[24] decreased activity status is a contributing factor for higher prevalence of constipation among quadriplegic patients. Increased

muscular tone in spastic cerebral palsy leads to decreased ambulatory status which is responsible for higher prevalence of constipation among them.[17] Lower extremity and trunk motility stimulate parasympathetic activity in colon and puts a mechanical effect by contraction of abdominal muscles that moves fecal material towards rectum and thus facilitate the process of defecation.[25,13]

Current study showed significant ($p<0.001$) but negative correlation (r= -0.52 U/E, r= -0.354 L/E) between spasticity and defecation frequency. Significant ($p<0.001$) and positive association (r= .530 U/E, r= .327 L/E) was found between severity level of constipation (CAS) and level of spasticity (MASS). According to a previous study by Awan WA et al on role of stretching exercises in management of constipation in spastic cerebral palsy, spasticity was found to be correlated significantly with constipation.[13] Another study conducted by Awan et al, reported that spasticity significantly reduce defecation frequency among CP children.[26] Spasticity contributes in colonic transit time delay and thus decreases defecation frequency. Lack of mobility due to spasticity in smooth muscles and altered motor activity in anal sphincter muscle contributes in causing fecal retention and delay in colonic transit time. [17] The anorectal angle is formed at the junction of rectum and anal canal which is 90 degree and increases during squat position of defecation. Spasticity in pelvic floor muscles does not allow this angle to be increased during defecation and thus decreases defecation frequency.[28-29]

According to the body mass index, 36 out of 81(44.4%) underweight participants of the current study, 20 out of 70(28.6%) normal weight participants, 3 out of 6(50%) overweight participants and 10 out of 13(76.9%) obese participants had constipation. Poor nutrition contributes significantly in poor growth among children with cerebral palsy. Oral motor dysfunction is one of the major factor responsible for causing malnutrition.[29, 30] Similarly another study has seen obesity and over nutrition common among CP children. BMI > 25 has observed to be higher among disable people than people without disabilities.[30]

In current study, participants who were taking more fluid, fiber and calories had higher frequency of defecation and lower severity level of constipation and vice versa. There was significant ($p<0.05$) and positive association of defecation frequency with fluid intake(r=0.326), fiber intake(r=0.100) and calories intake(r=0.159) while negative correlation was seen with severity of constipation (r= -0.307, -0.228, -0.206 for fluid fiber and calories intake respectively). Abnormal feeding behavior, oral motor dysfunction, difficulty in swallowing is one of the major complications in children with cerebral palsy. This contributes in less intake of food and ultimately mal-nutrition among them.[31] Adequate intake of fiber is important as it enhances laxation of fecal waste and prevents constipation. [32]

In current study, about 29 (17.1%) out of 170 participants were at level I of GMFCS, 24(14.1%) out of 170 were at level II, 36(21.2%) out of 170were at level III, 33(19.4%) out of 170 were at level IV while 48(28.2%) out of 170 were at level V of GMFCS. Prevalence of constipation was highest among level IV (19 out of 33) and level V (41 out of 48). A less GMFCS level indicates increased ambulatory status of children and vice versa. Lack of mobility is one of the major cause of constipation. [13]In one study by Eun Sook Park et al [17] delay in colonic transit time was observed among cerebral palsy children. Results showed that there was significant association ($p<0.05$) of colonic transit time and constipation with ambulatory function.

CONCLUSION

The study indicated that Constipation is highly prevalent in cerebral palsy. The early age, increased spasticity, decreased functional independence related to increased constipation CP children. It was also concluded that low fluid, calories and fiber intake were also contributing factor in development of constipation. The children with spastic cerebral palsy and quadriplegia are more related to constipation than other kind of cerebral palsy. The current study has very low sample size and weak methodology in establishing relationship between mentioned characteristics and constipation. It was

suggested that case control study with individual variables should be conducted to find magnitude of relationship with constipation. It was also suggested that a randomized control trail should be conducted with fluid and dietary interventions to find actual cause and effect relationship with constipation severity and defecation frequency in CP children.

REFERENCES

1. Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M, Damiano D et al. A report: the definition and classification of cerebral palsy April 2006. Dev Med Child Neurol Suppl. 2007;109:8-14.
2. Krigger, K.W. Cerebral palsy: an overview. American family physician. Am Fam Physician. 2006;73(1):91-100.
3. Graham, H.K. and P. Selber, Musculoskeletal aspects of cerebral palsy. J Bone Joint Surg Br. 2003;85(2):157-66.
4. Gilbert, W.M., et al., Adverse obstetric events are associated with significant risk of cerebral palsy. Am J Obstet Gynecol. 2010;203(4):328.e1-5
5. Venkateswaran, S, M.I. Shevell. Comorbidities and clinical determinants of outcome in children with spastic quadriplegic cerebral palsy. Dev Med Child Neurol. 2008;50(3):216-22.
6. Low JA, Galbraith RS, Muir DW, Killen HL, Pater EA, Karchmar EJ. Factors associated with motor and cognitive deficits in children after intrapartum fetal hypoxia. Am J Obstet Gynecol. 1984;148(5):533-9.
7. Hou M1, Fu P, Zhao JH, Lan K, Zhang H. Oral motor dysfunction, feeding problems and nutritional status in children with cerebral palsy. Zhonghua Er Ke Za Zhi. 2004;42(10):765-8.
8. Jones MW, Morgan E, Shelton JE, Thorogood C.Cerebral palsy: introduction and diagnosis (part I). J Pediatr Health Care. 2007;21(3):146-52.
9. Del Giudice E, Staiano A, Capano G, Romano A, Florimonte L, Miele E, et al. Gastrointestinal manifestations in children with cerebral palsy. Brain Dev. 1999;21(5):307-11.
10. Biggs, W.S. and Dery, W.H. Evaluation and treatment of constipation in infants and children. Am Fam Physician. 2006; 73: 469–477
11. Chao HC1, Chen SY, Chen CC, Chang KW, Kong MS, Lai MW, et al. The impact of constipation on growth in children.Pediatr Res. 2008;64(3):308-11
12. Penagini F, Mameli C, Fabiano V, Brunetti D, Dilillo D, Zuccotti GV. Dietary Intakes and Nutritional Issues in Neurologically Impaired Children. Nutrients. 2015;7(11):9400–9415.
13. Awan WA, Masood T. Role Of Stretching Exercises In The Management Of Constipation In Spastic Cerebral Palsy. J Ayub Med Coll Abbottabad. 2016;28(4):798-801.
14. Campanozzi A, Capano G, Miele E, Romano A, Scuccimarra G, Del Giudice E, et al. Impact of malnutrition on gastrointestinal disorders and gross motor abilities in children with cerebral palsy. Brain Dev. 2007;29(1):25-9.
15. Furness, J.B., The enteric nervous system: normal functions and enteric neuropathies. Neurogastroenterol Motil. 2008;20 Suppl 1:32-8
16. Veugelers R.J.G. A Population-Based Study on Comorbidity in Children with Severe Motor and Intellectual Disabilities: Focus on Feasibility and Prevalence [Internet]. Erasmus University Rotterdam; 2006. Available from: http://hdl.handle.net/1765/8118
17. Park ES, P.C., Cho SR, Na SI, Cho YS., Colonic transit time and constipation in children with spastic cerebral palsy. Arch Phys Med Rehabil. 2004;85(3):453-6.
18. Sullivan PB. Gastrointestinal disorders in children with neurodevelopmental disabilities. Dev Disabil Res Rev. 2008;14(2):128-36.
19. Norton C, Chelvanayagam S. Bowel problems and coping strategies in people with multiple sclerosis. Br J Nurs. 2010;19(4):220-6.
20. Staiano A1, Simeone D, Del Giudice E, Miele E, Tozzi A, Toraldo C. Effect of the dietary fiber glucomannan on chronic constipation in neurologically impaired children. J Pediatr. 2000;136(1):41-5.
21. Morisawa T, Takahashi T, Nishi S. Effects of passive lower limb and trunk exercises and diaphragm breathing exercise on intestinal movement. J Phys Ther Sci 2013;25(1):117–9.
22. Veugelers R, Benninga MA, Calis EA, Willemsen SP, Evenhuis H, Tibboel D et al. Prevalence and clinical presentation of constipation in children with severe generalized cerebral palsy. Dev Med Child Neurol. 2010;52(9):e216-21.
23. Inan M, Aydiner CY, Tokuc B, Aksu B, Ayvaz S, Ayhan S et al. Factors associated with childhood constipation. J Paediatr Child Health. 2007;43(10):700-6.
24. Sullivan PB, Lambert B, Rose M, Ford-Adams M, Johnson A, Griffiths P. Prevalence and severity of feeding and nutritional problems in children with neurological impairment: Oxford Feeding Study. Dev Med Child Neurol. 2000;42(10):674-80.
25. Knowles CH, Martin JE. Slow transit constipation: a model of human gut dysmotility. Review of possible aetiologies. Neurogastroenterol Motil. 2000;12(2):181–196.
26. Awan, W.A., T. Masood, and R. Kanwal, Nutritional status and its association with constipation in spastic cerebral palsy. Pak J Physiolo. 2019;15(2):66-71.
27. Kuijpers HC, Bleijenberg G. The spastic pelvic floor syndrome. A cause of constipation. Dis Colon Rectum. 1985;28(9):669–672..
28. Fung EB, Samson-Fang L, Stallings VA, et al. Feeding dysfunction is associated with poor growth and health status in children with cerebral palsy. J Am Diet Assoc. 2002;102(3):361–373.
29. Kuperminc MN, Stevenson RD. Growth and nutrition disorders in children with cerebral palsy. Dev Disabil Res Rev. 2008;14(2):137–146.
30. Rimmer JH, Wang E. Obesity prevalence among a group of Chicago residents with disabilities. Arch Phys Med Rehabil. 2005;86(7):1461–1464.
31. Lopes PA, Amancio OM, Araújo RF, Vitalle MS, Braga JA. Food pattern and nutritional status of children with cerebral palsy. Rev Paul Pediatr. 2013;31(3):344–349.
32. Williams CL, Bollella M, Wynder EL. A new recommendation for dietary fiber in childhood. Pediatrics. 1995;96(5 Pt 2):985–988.

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RESEARCH ARTICLE

ROLE OF PHYSIOTHERAPY IN IMPROVING QUALITY OF LIFE IN LIVER TRANSPLANT PATIENTS

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ABSTRACT

Objective: To evaluate the impact of pre and early post operative physical therapy on quality of life (QOL) in patients of liver transplantation. **Methods and materials**: A Single group pre and post experimental study design was conducted in Shifa International Hospital in which 20 patients with cirrhotic liver waiting for transplant participated. Non probability Convenience Sampling technique was used. Data was collected over a period of six months using a standard questionnaire 36-Item Short Form Survey (SF-36)and a General demographic questionnaire which included age, gender, BMI, along with diabetes, hypertension, ECOG level, tidal volume, muscle power, 6 minute walk test(heart rate, SpO2, distance covered, exertion level measurement). **Results**: The mean ± SD age & Body Mass Index of the participants (N=20) were 47.20 ± 11.49 years and 24.83 ± 2.1 respectively. 6 Minute Walk Test Heart Rate, 6 Minute Walk Test Distance, , ECOG, 6 Minute Walk Test Exertion Level and Muscle power were shown significantly improved throughout the treatment duration (*p<0.001*). While 6 Minute Walk Test Oxygen Saturation showed significant improvement only in initial two weeks (p=0.01), but at the end of 2nd week and overall improvement was not significant (*p≥0.05*). The results of the study also showed significant improvement (*p<0.001*) in all domains of quality of life (SF-36) at the end of study. **Conclusion**: The study indicated that early pre and post physiotherapy interventions can improve the overall health-related quality of life including the aerobic physical fitness and muscle strength in patients having liver transplantation

Keywords: 6 minute walk test, ECOG, Incentive spirometry, Liver transplantation, Muscle power, Physiotherapy, Quality of life.

INTRODUCTION

Liver transplant has emerged as one of the viable treatment in past decade. Systemic complication of chronic liver disease results from cardiopulmonary disease, Active alcohol and drug use, Malignancy outside liver, advanced age and AIDS.[1]

For the improvement in liver function and increasing the survival of patients who are suffering from end-stage or acute liver failure, the definite surgical treatment is the 'liver transplantation'.[2]

The health-related quality of life has been acknowledged with the surgical success in the recent years, and has become an important assessment parameter after the transplantation as well as during the disease process. [3] The physical activity level is usually reduced due to low physical performance status among liver transplant patient even before or after transplantation that over all compromises quality of life. But the limitation is multifactorial and depends on post transplantation duration and stage of disease. [4,5]

There are three phase of physical therapy intervention for liver transplant patient including preoperative, early postoperative and late postoperative phase. Every phase has its own known indication and contraindication for physical therapy intervention.[6] Assessments such as muscle strength & endurance are included in Physiotherapeutic evaluation along with assessment of aerobic capacity levels, independence in daily life activities, physical activity levels and quality of life. Further, investigation of pain, fatigue, alcohol & smoking habits and musculoskeletal, neurological or metabolic comorbidities are observed in assessment procedures. To overcome the post-operative deconditioning and complication due to physical inactivity, the patient can be assisted with the starting of physiotherapeutic interventions before the patient's transplantation .[6,7]

Reduced muscle strength, aerobic capacity and quality of life is also considered in patients with liver disease in relation to their stage of disease. A decreased aerobic capacity was displayed which was measured by the maximal cardiopulmonary exercise testing, in about 2/3rd of cirrhotic, who were not suffering from cardiopulmonary disease or having any other confounding factors.[7]

As in Pakistan liver transplantation was started in recent years, and physical therapy was considered as integral part of management in liver transplant, to avoid complication and improve quality of life. There is lack of evidence regarding role of physical therapy in liver transplant patients in Pakistan. The current was conducted to evaluate the impact of pre and early post-operative physical therapy on quality of life in liver transplant patients in Pakistan.

METERIAL & METHODS

A Single group pre and post experimental study design was conducted in Shifa International Hospital after the ethical approval of institutional review board and ethics committee (IRB#665-113-2016). Non probability Convenience Sampling technique was used for sample collection. A total of n=20 patients with cirrhotic liver waiting for transplant were included in the study. Physical therapy was performed pre and post liver transplant with an aim to improve the aerobic physical fitness along with the quality of life including an improvement in the muscle strength in liver transplantation patients. (Table 1).

Data was collected over a period of six months using a standard questionnaire 36-Item Short Form Survey (SF-36) and a General demographic questionnaire which included age, gender, BMI, along with diabetes, hypertension, ECOG level, tidal volume, muscle power, 6 minute walk test (heart rate, SpO_2, distance covered, exertion level measurement). Questionnaire was administered to all the patients with prior informed consent at zero week, second week and fourth week for the measurement of aerobic physical fitness level and muscle strength while quality of life was measured at zero week and at the end of fourth week. The data was analyzed by SPSS IBM 21. Categorical variables were presented as frequency, whereas continuous variables were presented as Mean ± S.D. Data was found normally distributed through Sphiro-wilk test, so repeated measure analysis of variance (RM-ANOVA) was used to analyze data.

Table 1 : Physical Therapy Protocol For Liver Transplant Patients

Intervention	Area/muscles/activity	Intensity	Frequency/Session	Sets/day	Duration/session
Pre-operative PT					
Spirometry	Chest/ Inspiratory muscles	2000-3000 ml	10 reps	One hourly	O5 minutes
ACBTS	Chest/ intercostal muscles and diaphragm	Deep breathing with full chest excursion	20 reps	BID	O5 minutes
Huffing & Cuffing	Chest/ expiratory muscles	Moderate to full expiratory force	10 reps	BID	O5 minutes
Percussion	Chest	Clapping with Moderate force	50 reps	BID	O5 minutes
Limb physio	AAROM of all four limbs	Full range movement of all major joints of both upper and lower limbs	20 reps	TID	10 minutes
Post-operative PT					
Spirometry	Chest/ Inspiratory muscles	Starting with 1000 ml and then progressing to 3000 ml within a week	10 reps	One hourly	O5 minutes
ACBTS	Chest/ intercostal muscles and diaphragm	Deep breathing with full chest excursion	20 reps	TID	O5 minutes
Huffing & Cuffing	Chest/ expiratory muscles	Moderate to full expiratory force	10 reps	TID	O5 minutes
Percussion	Chest	Clapping starting gently then with Moderate force	50 reps	TID	O5 minutes
Limb physio	AAROM of all four LIMBS. Gradually leading to strengthen exercises.	Full range movement of all major joints of both upper and lower limbs. Out of bed activity	20 reps	TID	10 minutes

RESULTS

The mean ± SD age & Body Mass Index of the participants (N=20) were 47.20 ± 11.49 years and 24.83 ± 2.1 respectively. The details of other categorical variable were shown in figure1.

6 Minute Walk Test Heart Rate, 6 Minute Walk Test Distance, ECOG, 6 Minute Walk Test Exertion Level, and Muscle power were shown significantly improved throughout the treatment duration (*p<0.001*). While 6 Minute Walk Test Oxygen Saturation showed significant improvement only in initial two weeks (*p=0.01*). But at the end of 2nd week and overall improvement was not significant (*p≥0.05*). (Table 2) The results of the study also showed significant improvement (*p<0.001*) in all domains of quality of life (SF-36) at the end of study. (Table 3)

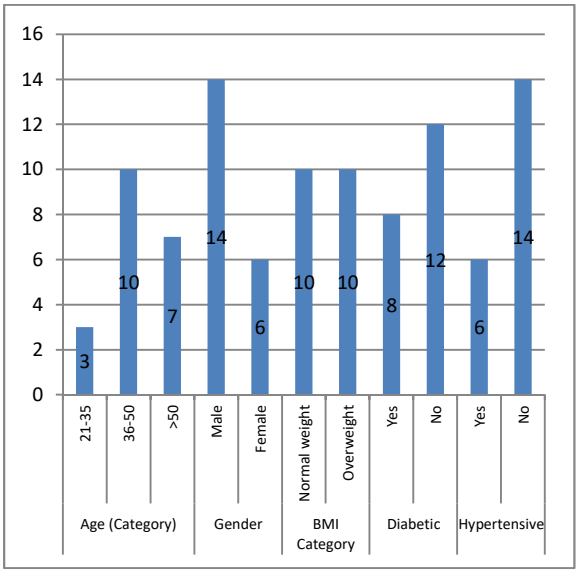

Figure 1: Demographics of study participants

Table 2: Within group changes

		Mean	SD.	*p-value*
6 Minute Walk Test-Heart Rate	0 week	103.37	11.08	*<0.001*[a]
	2nd week	93.28	6.50	*<0.001*[b]
	4th week	85.50	5.01	*<0.001*[c]
6 Minute Walk Test-SpO_2	0 week	91.80	2.99	*0.01*[a]
	2nd week	93.87	.91	*1.00*[b]
	4th week	94.12	3.68	*0.09*[c]
6 Minute Walk Test-Distance	0 week	180	58.11	*<0.001*[a]
	2nd week	225	36.71	*<0.001*[b]
	4th week	274	43.79	*<0.001*[c]
6 Minute Walk Test-Exertion Level	0 week	3.85	1.49	*<0.001*[a]
	2nd week	2.85	0.67	*<0.001*[b]
	4th week	1.40	0.75	*<0.001*[c]
ECOG Performance Status	0 week	2.45	.887	*<0.001*[a]
	2nd week	1.45	.759	*<0.001*[b]
	4th week	.45	.759	*<0.001*[c]
Tidal Volume (ml)	0 week	777.50	213.04	*0.07*[a]
	2nd week	2230.00	419.39	*<0.001*[b]
	4th week	3525.00	462.11	*<0.001*[c]
Muscle power	0 week	2.85	.48	*<0.001*[a]
	2nd week	3.75	.55	*<0.001*[b]
	4th week	4.75	.44	*<0.001*[c]

0Week vs 2nd week[a], 2nd week vs 4th week[b], 0Week vs 4th week[c]

Table 3: Quality of life in Liver Transplant Patient

		Mean	SD	*p-value*
Physical Function	Pre	49.62	19.40	*<0.001**
	Post	88.75	8.56	
Role limitation – Physical	Pre	5	10.25	*<0.001**
	Post	38.75	18.97	
Role limitation – Mental	Pre	0	2.56	*<0.001**
	Post	43.3333	19.22	
Social Function	Pre	33.125	7.78	*<0.001**
	Post	76.25	19.35	
Pain	Pre	44	15.96	*<0.001**
	Post	75.5	11.76	
Mental Health	Pre	39.75	5.72	*<0.001**
	Post	65.5	12.23	
Energy / Vitality	Pre	42.75	12.29	*<0.001**
	Post	70.75	6.93	
General Health	Pre	21.5625	4.28	*<0.001**
	Post	61.875	8.33	
Health Change (In 1 year)	Pre	11.25	12.76	*<0.001**
	Post	82.50	11.75	

*Level of significance <0.001**

DISCUSSION

The objective of the current study was to evaluate the impact of pre and early post-operative physical therapy on quality of life (QOL) in patients going through liver transplantation. The results showed overall significant improvements in all domains of QOL (SF-36).

The current study showed that 6 Minute Walk Test Heart Rate, 6 Minute Walk Test Distance, ECOG, 6 Minute Walk Test Exertion Level, and Muscle power was significantly improved throughout the treatment duration. In a retrospective study, there was achievement of significant functional gains by 55 liver transplant recipients after acute inpatient rehabilitation. Significant improvements were reported in various measurements such as aerobic capacity, physical performance and muscle strength, as a result of the rehabilitation process.[7]

The complaints of muscle pain, joint pain along with distress, incision pain & fatigue are commonly reported by those who have been undergone transplant, either during exercises or after exercises.[3] Some of the common hindrances in achieving a high QOL in liver transplant patients includes the fatigue levels, reduced physical activity, inability to work, and compromised psychological health.[6] Several studies suggested that, patients who are waiting for liver transplantation, specific exercises and rehabilitation programs are necessary and helpful in increasing their muscle strength, endurance, aerobic fitness, functional independence the daily life and health-related QOL.[7,8,9]

In current study significant improvement was shown in the physical functioning domain after physical therapy in liver transplant patients. The level of physical activity is mostly limited and decreased due to the less physical performance in liver transplant patients both before and after the surgery. This limitation depends on the severity and stage of condition and post-transplant duration. In chronic diseases, research has shown that high level of quality of life is significantly improved with increased physical activity.[10] Athletes who are competing in transplant game showed significant improvement in post-transplant fitness. If pre & early physical therapy interventions are taken then QOL can be improved in patients within a month.[5,9-12]

The current study showed that there was significant improvement in the Energy / Vitality domain of Sf-36. It was reported by a study that 44% patients, complained about severe fatigue, up to more than a decade after the transplant which was causing distress in the 1st year following their transplant.[5] Further, a study also suggested that the fatigue experienced by those patients have liver transplant were attributed to the physical factors as those opposed to psychological factors.[13]

In the current study aerobic fitness was improved in the patients at 4th week of their physiotherapy treatment which ultimately improves the health related quality of life. If early physical therapy interventions are carried out in these patients then the level of severity can be reduced by improving the muscle strength.[14]

Long time immobilization in ICU can cause muscle atrophy, reduced lung expansion and diminished bronchial drainage. While Physiotherapy of the ICU patients reduces the complications which are cause due to immobilization. It can also further provide the respiratory support to prevent post-operative pulmonary complications while also restoring the functional independency.[15] Early pulmonary physiotherapy should be started once patient comes in ICU and should continue till his discharge. In current study patients showed significant increase in their respiratory capacity in 4 weeks indicated by improvement in tidal volume. Pulmonary physical therapy includes breathing exercises, postural drainage, and incentive spirometry etc. Incentive spirometry can help to improve the lung capacity and strengthen the respiratory muscles.[16,17], [18]

CONCLUSION

The early pre and post physiotherapy interventions can improve the levels of aerobic physical fitness along with the muscle strength and health-related quality of life in patients of liver transplantation. While the main limitations of the study such as small sample size with no comparison group and single centered study, compromises the generalizability of study. Along with these factors gender base differences like physical, psychosocial or cultural may be included in future studies as these factors affects the aerobic physical fitness levels, along with muscle strength and health-related quality of life levels in normal population.

REFERENCES

1. Iscar M, Montoliu M, Ortega T, Rodriguez B, Rodríguez M, Glez-Pinto I, et al., editors. Functional capacity before and after liver transplantation. Transplant Proc. 2009;41(3):1014-5.
2. Compston JE. Osteoporosis after liver transplantation. Liver Transpl. 2003;9(4):321-30.
3. Senduran M, Yurdalan U. Physiotherapy in Liver Transplantation, Liver Transplantation – Technical Issues and Complications, Prof. Hesham Abdeldayem 2012 (Ed.), InTech
4. Wiesinger GF, Quittan M, Zimmermann K, Nuhr M, Wichlas M, Bodingbauer M, et al. Physical performance and health-related quality of life in men on a liver transplantation waiting list. J Rehabil Med. 2001;33(6):260-5.
5. Van den Berg-Emons R, Kazemier G, van Ginneken B, Nieuwenhuijsen C, Tilanus H, et al. Fatigue, level of everyday physical activity and quality of life after liver transplantation. J Rehabil Med. 2006;38(2):124-9.
6. Masala D, Mannocci A, Unim B, Del Cimmuto A, Turchetta F, Gatto G, Santoro R, et al. Quality of life and physical activity in liver transplantation patients: results of a case-control study in Italy. Transplant Proc. 2012;44(5):1346-50. doi: 10.1016/j.transproceed.2012.01.123
7. Cortazzo MH, Helkowski W, Pippin B, Boninger ML, Zafonte R. Acute inpatient rehabilitation of 55 patients after liver transplantation. Am J Phys Med Rehabil. 2005;84(11):880-4.
8. Brustia R, Savier E, Scatton O. Physical exercise in cirrhotic patients: towards prehabilitation on waiting list for liver transplantation. A systematic review and meta-analysis. Clin Res Hepatol Gastroenterol. 2018;42(3):205-215.
9. Vogelaar L, van den Berg-Emons R, Bussmann H, Rozenberg R, Timman R, van der Woude CJ. Physical fitness and physical activity in fatigued and non-fatigued inflammatory bowel disease patients. Scand J Gastroenterol. 2015;50(11):1357-67.
10. Pupka A, Płonek T, Lewicki K, Maroszyk J. Influence of physical activity on the health condition of people after organ transplantation. Med Sport. 2008;12(4):142-5.
11. Pirenne J, Van Gelder F, Kharkevitch T, Nevens F, Verslype C, Peetermans WE, et al. Tolerance of liver transplant patients to strenuous physical activity in high-altitude. Am J Transplant. 2004;4(4):554-60.
12. Van Adrichem EJ, Siebelink MJ, Rottier BL, Dilling JM, Kuiken G, van der Schans CP, et al. Correction: Tolerance of Organ Transplant Recipients to Physical Activity during a High-Altitude Expedition: Climbing Mount Kilimanjaro. PloS one. 2015;25;10(11):e0142641.
13. van den Berg-Emons R, van Ginneken B, Wijffels M, Tilanus H, Metselaar H, Stam H, et al. Fatigue is a major problem after liver transplantation. Liver Transpl. 2006;12(6):928-33.
14. Pieber K, Crevenna R, Nuhr MJ, Quittan M, Peck-Radosavljevic M, Fialka-Moser V, et al. Aerobic capacity, muscle strength and health-related quality of life before and after orthotopic liver transplantation: preliminary data of an Austrian transplantation centre. J Rehabil Med. 2006;38(5):322-8.
15. Stiller K. Physiotherapy in intensive care: towards an evidence-based practice. Chest. 2000;118(6):1801.
16. Clini E, Ambrosino N. Early physiotherapy in the respiratory intensive care unit. Respir Med. 2005;99(9):1096-104.
17. Pasquina P, Tramèr MR, Granier JM, Walder B. Respiratory physiotherapy to prevent pulmonary complications after abdominal surgery: a systematic review. Chest. 2006;130(6):1887-99.
18. Maffei P, Wiramus S, Bensoussan L, Bienvenu L, Haddad E, Morange S,. Intensive early rehabilitation in the intensive care unit for liver transplant recipients: a randomized controlled trial. Arch Phys Med Rehabil. 2017;98(8):1518-25.

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RESEARCH ARTICLE

GENDER BASED DIFFERENCE IN QUALITY OF LIFE AFTER PHASE II CARDIAC REHABILITATION IN PATIENTS WITH CORONARY ARTERY BYPASS GRAFT SURGERY

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ABSTRACT

Objective: To determine the gender based differences in quality of life after phase II cardiac rehabilitation in post coronary artery bypass graft surgery (CABG) **Material & Methods:** A Quasi experimental study was conducted Shifa international hospital (SIH) Islamabad from June 2017 to November 2017 (IRB&: 778-053-2017). The sample of n=30 participants (male = 15, female = 15), were collected through non-probability Convenient sampling method. Male and female participants between 45-60 years of age with coronary artery bypass graft surgery and completed phase I cardiac rehabilitation program were included in the study. To measure quality of life RAND 36-Item Health Survey was used at 0 week and after 8 week. **Results**: The mean age of study participants in female was 54.53±3.357 and male 55.60±5.20 years. The results showed that there post intervention significant improvement was observed in male than female regarding physical functioning (33.33±4.98 vs. 70±41.40, *p=0.028*). Role limitation due to physical health also showed more improvement in male than female (MD=21.66). Role limitation due to emotional showed significant improve in females than male (26.66±45.77 vs. 80±41.40, *p=0.002*). **Conclusion**: The study indicated that 8 week phase II cardiac rehabilitation programs had significant role in improving all domains of Quality of life (SF-36). But physical function, role limitation due to physical health and role limitation due to emotional problem were more improved in male as compare to female.

Keywords: Cardiac rehabilitation, CABG, quality of life, gender

INTRODUCTION

Cardio vascular diseases are one of the major diseases that caused morbidity and mortality all around the world.[1] According to rough estimate 17 million people die of heart diseases globally in a year. However in Pakistan mortality rate due to cardiovascular diseases are 455 male and 388 female deaths per 100,000 people.[2]

In Conroy artery disease (CAD), complications such as worsening of psychosocial function may be expected, because patients have to face the challenges of a new life phase that can be accompanied by physical and mental deterioration.[3] One of the main reasons to offer cardiac surgery is to improve both survival and quality of life. Coronary artery bypass graft (CABG) has been shown to be cost-effective at 5 years compared to medical therapy, and compared to percutaneous coronary intervention in multi-vessel CAD.[4]

The physical, psychological, spiritual, and social well-being is important components of quality of life of the client, which are affected greatly by cardiovascular diseases.[5] Quality of life in Coronary artery disease (CAD), affects not only the physical performance but the psychological and social behavior of these patients as well 6. Gender based differences have also a significant impact on quality of life due to differences in biology, psychology and social roles.[7] Women show slower return to physical, leisure and social activities than men. On the other hand men reports earlier recovery. The women who are lower on quality of life issues may suggest that their needs are not being met.[8] Cardiac rehabilitation program has been proven to improve physical performance, decrease depression and increase quality of life.[9] The benefits of CR on exercise ability and on risk-factor modification are equally as good for women as for men of while controlling confounding factors.[8] Phase II starts after completion of Phase I cardiac rehabilitation program in early hospital stay that includes, care of chest (incision site), improve lung compliance and exercise which improve daily living activities, patient and family education and changes in life style.[10] Phase II of cardiac rehabilitation is conducted in outpatient clinic focus on Increasing overall strength and aerobic capacity, exertion level (RPE) and self-monitoring of heart rate (HR) are the physical goals we want to achieve. The patient

comes for monitored exercise and the rehab team keeps a close watch on how the exercises affect heart. Under the supervision of physical therapist, there is progressive increase in exercises.[10,11]

In Pakistan, there is significant diversity in male and female regarding psychosocial roles and responsibilities as compare to developed countries like America, UK etc. It may affect CR II response as they are receiving in outpatient department as compare to in patient Phase I CR. The purpose of the study was to determine the gender based differences in quality of life after phase II cardiac rehabilitation in post CABG patients.

MATERIAL & METHODS

A Quasi experimental study was conducted Shifa international hospital (SIH) Islamabad from June 2017 to November 2017 after receiving approval from the Ethical Committee (IRB&: 778-053-2017). The sample of n=30 participants (male= 15, female= 15), undergoing cardiac surgery and follow-up in rehabilitation OPD of SIH, were collected through non-probability Convenient sampling method. (Figure 1)

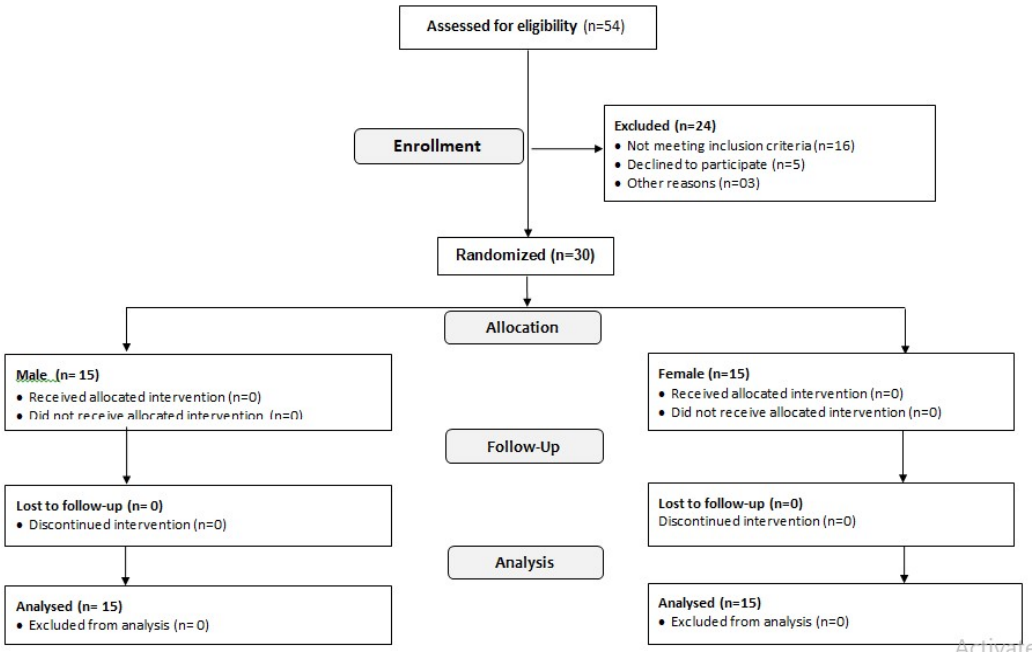

Figure 1: CONSORT diagram

Male and female participants between 45-60 years of age with coronary artery bypass graft surgery and completed phase I cardiac rehabilitation program were included in the study. Participant having communication disorder that could not be overcome with an interpreter, stroke and other neurological disorders and smokers were excluded from the study. The intervention protocol for male and female were incorporated for 8 weeks. The detail of protocol can be seen in table 1.

The data was collected through General Demographic Performa, comprised of age, height, weight, BMI, history of diabetes etc. to measure quality of life RAND 36-Item Health Survey (Version 1.0) was used at 0 week and after 8 week.

After checking the normality of data parametric tests were applied. The frequency, percentages, mean±SD, mean difference and p-value was used for descriptive statistics. Although the data was not normally distributed but for with in group analysis paired t-test was used, as mean and median of SF-36 was not clinically different. To determine the difference in quality of life between groups, before and after 8 week intervention, independent t- test and mean difference was used. SPSS V. 21 was used to analyze the data.

Table 1: Phase II Cardiac Rehabilitation Protocol for Protocol male and female participants

	Flexibility/warmup (Daily)	Aerobics (Daily)	Strength (bi-weekly)
Type of Exercises	• Stretching of cervical, upper back, calf and hamstring muscles, Shoulder shrugging and shoulder rotation was performed actively	• Treadmill exercise • Recumbent bike, • Exercises	• Strength training (weights for arm exercise, elastic bands, quadriceps bench)
Frequency	• Stretching: 30 sec, 3-5 repetitions/session • Warm-up: 15-20 repetition	• 11-13 repetition/session • 2 to 3 sets for every type of exercise	• 10-12 repetition/session. • 2 to 3 sets for every type of exercise
Intensity	• Stretching: According to patient comfort	• Slow to moderate pace. Avoid becoming short of breath.	• Effort which was not forceful, pain free. • Weight in pounds:3 to 5 • Progress accordingly
Duration (30-60 Minutes)	• 15 min./session for 8 week	• 1st week: 5 to 10 minutes • 2nd week: 11 to 15 minutes • 3rd week: 16 to 20 minutes • 4th week: 20 minutes • 5th week: 25minutes • 6th week: 30 minutes • 7th week: 35 minutes • 8th week:36 to 40	• 15 min./session for 8 week

RESULTS

The mean age of study participants in female was 54.53±3.357 and male 55.60±5.20 years. The mean BMI in female and male was 24.34±2.78 and 23.01±3.21 respectively, in both groups. Equal patients i-e; 11 male and 11 female had diabetes while 4 male and 4 females were non-diabetic. (Figure 2)

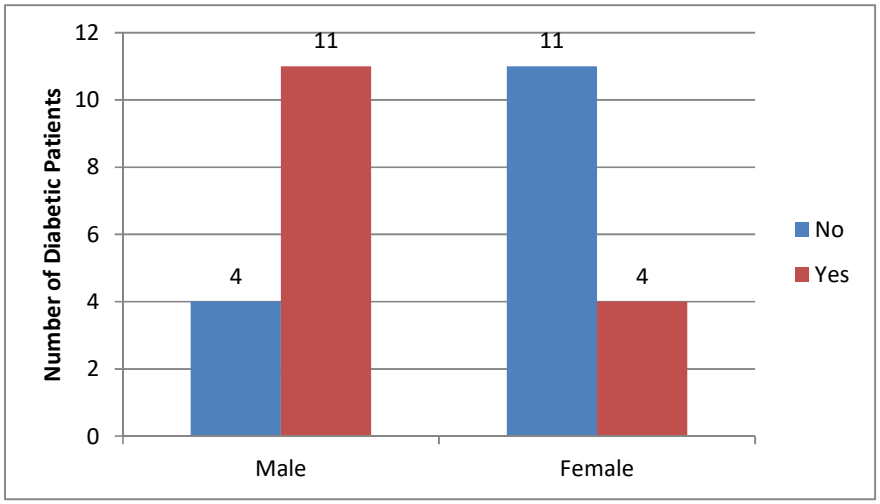

Figure 2: Diabetes distribution in males and females

Within group analysis showed that both female and male significantly improved (*p≤0.05*) in all domains of quality of life (SF-36) except in female participants physical function did not improve significantly (18±26.37 versus 33.33±44.98, *p=0.063*) after 8th weeks of phase II cardiac rehabilitation.(Table 2)

The results showed that there post intervention significant improvement was observed in physical functioning of males than female (33.33±4.98 versus 70±41.40, *p=0.028*). Role limitation due to physical health did not showed any statistically significant difference in female and male participants (50±49.09 versus 71.66±43.16, *p=0.210*), but while looking effect size (MD=21.66) male were improve more as compare to female. Role limitation due to emotional showed significant improve in females than male (26.66±45.77 versus 80±41.40, *p=0.002*).

The MD of energy/fatigue level, emotional wellbeing, social functions, pain and general health, at baseline and after 8 weeks of phase II cardiac rehabilitation, did not show any clinically significant difference in means of females and males. (Table 3)

Table 2: With-in group Analysis QOL (SF-36)

		Female				Male			
		Mean	SD	MD	*p-value*	Mean	SD	MD	*p-value*
Physical functioning	Pre	18	26.37	-15.33	*.063*	33	27.89	-37	*<0.001***
	Post	33.33	44.98			70	41.40		
Role limitation due to physical functioning	Pre	0	0	-50	*.001**	0	0	-71.66	*<0.001***
	Post	50	49.09			71.66	43.16		
Role limitation due to emotional problem	Pre	0	0	-26.66	*.041**	0	0	-80	*<0.001***
	Post	26.66	45.77			80	41.40		
Energy/fatigue	Pre	46.66	17.33	-29.166	*<0.001***	63.33	16.68	-26.66	*<0.001***
	Post	75.83	13.74			90	14.33		
Emotional well being	Pre	38.83	17.59	-20.83	*<0.001***	60.33	16.76	-22.5	*<0.001***
	Post	59.66	17.90			82.83	16.76		
Social function	Pre	82.93	3.19	-13.33	*<0.001***	82.40	2.94	-13.33	*<0.001***
	Post	96.26	4.13			95.73	4.13		
Pain	Pre	32.66	16.13	-23.66	*<0.001***	59.33	12.65	-24	*<0.001***
	Post	56.33	17.97			83.33	15.31		
General health	Pre	38	20.68	-25	*<0.001***	59.66	19.12	-26	*<0.001***
	Post	63	22.26			85.66	17.09		

***Level of significance: <0.001*

** Level of significance : <0.05*

Table 3: Between group analysis

		Female		Male		MD	*p-value*
		Mean	SD	Mean	SD		
Physical functioning	Pre	18	26.37	33	27.89	-15	*0.141*
	Post	33.33	44.98	70	41.40	-36.67	*0.028**
Role limitation due to physical functioning	Pre	0	0	0	0	0	*NA*
	Post	50	49.09	71.66	43.16	-21.66	*0.210*
Role limitation due to emotional problem	Pre	0	0	0	0	0	*NA*
	Post	26.66	45.77	80	41.40	-53.34	*0.002*
Energy/fatigue	Pre	46.66	17.33	63.33	16.68	-16.67	*0.012**
	Post	75.83	13.74	90	14.33	-14.17	*0.010**
Emotional well being	Pre	38.83	17.59	60.33	16.76	-21.5	*0.002**
	Post	59.66	17.90	82.83	16.76	-23.17	*<0.001***
Social function	Pre	82.93	3.19	82.40	2.94	0.53	*0.638*
	Post	96.26	4.13	95.73	4.13	0.53	*0.726*
Pain	Pre	32.66	16.13	59.33	12.65	-26.67	*<0.001***
	Post	56.33	17.97	83.33	15.31	-27	*<0.001***
General health	Pre	38	20.68	59.66	19.12	-21.66	*<0.001***
	Post	63	22.26	85.66	17.09	-22.66	*<0.001***

***Level of significance: <0.001*

** Level of significance: <0.05*

DISCUSSION

The objective of the study was to determine gender based differences in quality of life (QOL) in patients with coronary artery bypass graft (CABG) after phase II cardiac rehabilitation (CR). The results showed that all domain of Quality of life (SF-36) significantly improve in female participants except physical functioning and male participants significantly improve in all domains. The results also showed that male participants significantly improvement in physical function, role limitation due to physical health and role limitation due emotional health than female participants.

Cardiac rehabilitation helps patients to come back in normal life after surgery. However it is seen that outcomes of the cardiac rehabilitation phase II is different for male and females. Researches support that cardiac rehabilitation improves quality of life both in male and female. A study conducted to evaluate the effectiveness of Cardiac Rehabilitation Care Plan on Quality of Life of Patients Undergoing Coronary Artery Bypass Graft Surgery, showed increased quality of life after 13 sessions in male and female post cardiac rehabilitation phase II.[12] A similar study done by Alexander et al. also portrayed the same results after 12 week sessions of cardiac rehabilitation phase II on both the genders.[13] A study conducted by Muller-Nor horn et al. also showed significantly improved quality of life of male and female patients after cardiac rehabilitation following the open heart surgery.[14] In 2002, Lindsay et al. performed a study on 183 patients who had had bypass surgery and SF36 questionnaire was used to measure the impact of cardiac rehabilitation after bypass surgery for both male and female group. The results showed that after completing cardiac rehabilitation programs with major factor of education, a marked difference was observed between both groups in terms of role limitation due to physical functioning; general health, social functioning, and physical health.[15]

Male group showed better results than the female group which is in accordance with a similar study that showed less improvement in women in terms of physical functioning and activities than the male patients. It was seen in the domain of role limitation of emotional problems that p-value between both groups is insignificant as the researches also show that females are more depressed and show more anxiety than males.[16] In the domain of fatigue/energy it was seen that female patients had more fatigue/energy issues in the beginning of the study than the male patients as starting mean value of females was 29 and of males was 63. Whereas after the completion of the study mean was 52.67 in females and 87 in males. Hence the extent of betterment was more in males than females as the p value between groups was 0.00. Studies also showed that women are easily fatigued as compared to male after rehabilitation.[17]

It has been seen in the domain of social function and general health that there was a prominent difference in the results of both groups as in the domain of pain too. However the mean pre score of male patients is higher than that of females but the extent of betterment in terms of score was not same in both groups. The p–value was 0.00 which shows there was significant difference in the results of both male and female groups. Literature review supports males patients significantly improved in social functioning and general health than females post cardiac rehabilitation phase II.[18] Literature reviews also suggest that postoperative and procedural pain was more severe among women than men.[19]

Moreover the male patients in our social environment have active lifestyle and in some cases patients have to go back to normal lifestyle as early as possible. On the other hand the female patients have comparatively less pressure of going back to normal life so therefore they progress slowly. In the overall analysis women showed slow and less recovery in the activities of daily livings than males in phase II but general mental and health status improved. Physical functioning in female also not significantly improved. The possible reason is that in our study housewives are included as they are less likely to go outside the house.

As there is lack of information about contributing/confounding factors in relation gender, that may affect QoL must be included in future studies with larger sample to determine the impact of phase II cardiac rehabilitation. It is also suggested that multi-disciplinary team approach was missing in current study, that may positively affect both male and female regarding their Quality of Life must be incorporated in future study.

The sample of the study was 30 which is also very small, therefore further studies with large sample size and on larger scale with more controlled environment is required in order to obtain more refined results.

CONCLUSION

The study indicated that 8 week phase II cardiac rehabilitation programs had significant role in improving all domains of Quality of life (SF-36). But physical function, role limitation due to physical health and role limitation due to emotional problem were more improved in male as compare to female.

REFERENCES

1. Mc Namara K, Alzubaidi H, Jackson JK. Cardiovascular disease as a leading cause of death: how are pharmacists getting involved?. Integr Pharm Res Pract. 2019;8:1–11.
2. Russell S, Sturua L, Li C, Morgan J, Topuridze M, Blanton C, et al. The burden of non-communicable diseases and their related risk factors in the country of Georgia, 2015. BMC Public Health. 2019;19(3):479.
3. Opić P, Roos-Hesselink JW, Cuypers JAAC, Witsenburg M, van den Bosch A, van Domburg RT, et al. Longitudinal development of psychopathology and subjective health status in CHD adults: a 30- to 43-year follow-up in a unique cohort. Cardiol Young. 2015;26(3):547-55.
4. Perrotti A, Ecarnot F, Monaco F, Dorigo E, Monteleone P, Besch G, et al. Quality of life 10 years after cardiac surgery in adults: a long-term follow-up study. Health Qual Life Outcomes. 2019;17(1):88.
5. Oliveira AJ, Lopes CS, Rostila M, Werneck GL, Griep RH, Leon AC, et al. Gender differences in social support and leisure-time physical activity. Rev Saude Publica. 2014;48(4):602-12.
6. Srivastava S, Shekhar S, Bhatia MS, Dwivedi S. Quality of Life in Patients with Coronary Artery Disease and Panic Disorder: A Comparative Study. Oman Med J. 2017;32(1):20-6.
7. Ngun TC, Ghahramani N, Sánchez FJ, Bocklandt S, Vilain E. The genetics of sex differences in brain and behavior. Front Neuroendocrinol. 2011;32(2):227-46.
8. Mithal A, Bansal B, Kyer CS, Ebeling P. The Asia-Pacific Regional Audit-Epidemiology, Costs, and Burden of Osteoporosis in India 2013: A report of International Osteoporosis Foundation. Indian J Endocrinol Metab. 2014;18(4):449-54.
9. Servey JT, Stephens M. Cardiac Rehabilitation: Improving Function and Reducing Risk. Am Fam Physician. 2016;94(1):37-43.
10. Stewart KJ, Badenhop D, Brubaker PH, Keteyian SJ, King M. Cardiac rehabilitation following percutaneous revascularization, heart transplant, heart valve surgery, and for chronic heart failure. Chest. 2003;123(6):2104-11.
11. Parks D, Allison M, Doughty R, Cunningham L, Ellis CJ. An audit of phase II cardiac rehabilitation at Auckland hospital. N Z Med J. 2000;113(1109):158-61.
12. Masoumi SZ, kazemi f, Khani S, Seifpanahi-Shabani H, Garousian M, Ghabeshi M, et al. Evaluating the Effect of Cardiac Rehabilitation Care Plan on Quality of Life of Patients Undergoing Coronary Artery Bypass Graft Surgery. Int J Cardiovasc Pract; Vol 2, No 2 (2017)DO - 1021859/ijcp-020204. 2017.
13. Alexander JL, Wagner CL. How cardiac rehabilitation relates to quality of life. Rehab Nurs. 2006;31(4):155-7.
14. Müller-Nordhorn J, Kulig M, Binting S, Völler H, Gohlke H, Linde K, et al. Change in quality of life in the year following cardiac rehabilitation. Qual Life Res. 2004;13(2):399-410.
15. Lindsay GM, Hanlon W, Smith LN, Belcher P. Experience of cardiac rehabilitation after coronary artery surgery: effects on health and risk factors. Int J Cardiol. 2003;87(1):67-73.
16. Izawa KP, Oka K, Watanabe S, Yokoyama H, Hiraki K, Morio Y, et al. Gender-related differences in clinical characteristics and physiological and psychosocial outcomes of Japanese patients at entry into phase II cardiac rehabilitation. J Rehabili Med. 2008;40(3):225-30.
17. Michielsen HJ, De Vries J, Van Heck GL. Psychometric qualities of a brief self-rated fatigue measure: The Fatigue Assessment Scale. J Psychosom Res. 2003;54(4):345-52.
18. Oberai S. Review study of health related quality of life (HRQL) among coronary artery disease patients after cardiac surgery. Indian J Occup Ther. 2014;46(1).
19. Fillingim RB, King CD, Ribeiro-Dasilva MC, Rahim-Williams B, Riley III JL. Sex, gender, and pain: a review of recent clinical and experimental findings. J Pain. 2009;10(5):447-85.

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