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Provide a context or background for the study (i.e., the nature of the problem and its significance). State the specific purpose or research objective of, or hypothesis tested by, the study or observation; the research objective is often more sharply focused when stated as a question. Both the main and secondary objectives should be made clear, and any pre-specified subgroup analyses should be described. Give only strictly pertinent references and do not include data or conclusions from the work being reported.

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Conclusion should elucidate how the results communicate to the theory presented as the basis of the study and provide a concise explanation of the allegation of the findings.

ACKNOWLEDGEMENT

Provide the list of individuals who contributed in the work and grant details where applicable

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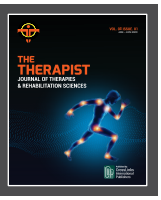

Editorial

Targeted Therapies in Chronic Kidney Disease

Fahad Tanveer[1*]

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About a millions of glomeruli, or filtration units, found in the kidney linked to the tubules where water and solutes from the primary urine are selectively reabsorbed. Both the glomerular and tubular compartments are eventually affected by acute and chronic kidney diseases, but circulating substances like antibodies or cytokines frequently target the glomeruli first. A minimum of three months must pass before there are any abnormalities in renal function in order for the patient to be diagnosed with chronic kidney disease (CKD). Twenty million people in the US have CKD. Despite being a major global health burden, chronic and acute kidney illness still lack effective treatments. Current treatments, like anti-inflammatory steroids, have systemic side effects and cannot halt the disease's development. Although efforts have been made to create renally pursued treatments, no such strategy exhibits yet entered the clinic. At this time, we provide a critical overview of the state of drugs and delivery methods that specifically target the kidneys [1].

Functional results fall into two categories: (i) Targeting the kidney causes the renal-to-liver ratio to rise. This is referred to as explicit targeting; (ii) the medication accumulates more in the kidneys while the kidney verses liver proportion stays the same, which allows the carrier to boost uptake generally. Overall, targeting that was focused on receptors and transporters was the most successful. The biggest task for nanoparticulate formulations is to reach glomerular cells and prevent liver accumulation [2].

Long-term contact with a carrier may be necessary to treat chronic kidney illnesses. Evidence on frequency, quantity, and application as well as the kinetics of degradation must be converted crazy about kinetic models of degradation and uptake in order to determine whether possibly lethal accumulation is to be predictable for decomposable polymers.

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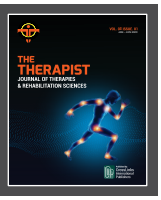

Original Article

Frequency of Non-Specific Low Back Pain Among School Going Adolescents in Peshawar

Naeem Ur Rahman[1*], Qasid Ullah[2], Naeem Ullah[3] and Mujahid Ahmad[4]

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ABSTRACT

Nonspecific low back pain is a state which is characterized by discomfort and inflexibility in the lumbo-sacral area without any underlying pathology. NSLBP is taken as non-specific when any mechanical and structural impairment cause is excluded. Initial symptom starts when a person is in the phase of adolescence and further continuous. **Objective:** To evaluate the frequency of non-specific low back pain in school going adolescents. **Methods:** Cross sectional study design was used. Total 202 samples were taken through consecutive sampling technique. Study duration was six months. The study setting was different private schools of Hayatabad Peshawar. Students of age 10- to 19-year-old were included in the study. The results were analyzed by using SPSS version 23. Results were shown in the form of tables and graphs. **Results:** According to the results 108 (53.5%) students reported to have NSLBP. Total 202 subjects were added in study, in which 150 were males and 52 were females. Total 106 participants were between the ages of 10 to 15 years. The remaining 96 students were between the ages of 15 to 19 years. According to Wong-bakers faces pain rating scale 84 participants reported to have non-specific low back pain while 64 participants reported pain for 12 to 24 hours. Students from frontier student's academy reported to have repeated NSLBP. **Conclusion:** Nonspecific low back pain is a familiar condition that occurs in school going children and adolescents. Due to heavy back packs, poor posture and prolong setting

INTRODUCTION

Non-specific low back pain is a state which is characterized by discomfort and inflexibility in the lumbo-sacral area without any underlying pathology [1]. It is also defined as, non-specific low back is any pain without proper etiology and any disease [2]. Area around buttocks and lower surface of ribcage is commonly called as lumbo sacral area [3]. Any structure innervated in the lumbar spine can give rise to the symptoms in low back and associated pain into lower limb or lower limbs [4]. The symptoms are produced by number of structures in the back, including joints, discs and connective tissues [3]. NSLBP is taken as non-specific when any mechanical and structural impairment cause is excluded [5]. Several studies about NSLBP reveals that its initial symptom starts when a person is in the phase of adolescence and further continuous [2]. Regarding non-specific low back pain it is observed that it occurs in childhood [6]. Specific low back pain is very famous malfunction in adolescents and it effect every second person in the community [3].Those adolescents who develop low back pain at the age of 14 have chances to develop low back pain at the age of 25 as well [7]. Incidence and prevalence of current researches about NSLBP comes to a conclusion that pain prevalence changes in between 7 and 62%. About 33% prevalence of NSLBP among adolescence were found in one study, furthermore this prevalence is undervalued because there

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is not any proper diagnosis [2]. The prevalence 46.7% NSLBP is present in Pakistan [8]. According to period and point prevalence of NSLBP, point prevalence include up to 33% prevalence, period prevalence show 65% and for whole life prevalence it is 84% [3]. LBP that require medical examination and its prevalence is 8 to 16% while pain that interrupt school and recreational activities changes from 7 to 27% [6]. Reported prevalence of back pain include,64.8% for Danish adolescents, Norwegian comprises of 57% prevalence, Spanish include 46.2% prevalence, German adolescents include 30.2% while Americans adolescents consist of 40.2% prevalence of LBP [9]. Wide range of studies about NSLBP among adolescents suggested that its etiology is not just one etiology we consider, but lots of risk factors combine together and give a reason to high risk of NSLBP [10]. However other causes of NSLBP include height, weight/body mass index, physical activity, sedentary lifestyle, mechanical stress(by carrying heavy bags), Psychological factors and the social environmental factor [11]. Both physical and structural causes play a fundamental role in the progression or expansion of NSLBP, while structural etiology include disk herniation which puts pressure on nerves of the spine and will leads to pain, in this pain type it is not considered as non- specific because this is not the direct etiology of pain in the back. It is amazing that at the age of 15 one in every third child will expose to low back pain [5]. A very good example of NSLBP is when a person is having bad posture and leads to pain in the back, and this pain can be minimize through different exercises and good posture instructions by therapists, but this pain will be still called as non-specific back pain, because there is no proper abnormality that we consider its etiology of pain [5]. NSLBP risk factors include, Age (one study shows that prevalence of back pain becomes high as age increases), Gender (NSLBP prevalence is considered as increase in females as compared to males), Family history and heredity (NSLBP is reported as hereditary and found among parents), Anthropometric parameters, Movement of spine and extensibility of joints and muscles, Strength of muscle, Normal spine position, Participation in sports and exercises, functioning in school, initial disk pathologies, habit of smoking, watching television without taking any rest, improper sitting position and other factors include birth anomalies ,improper transport systems, and leg length discrepancy [12]. Different type of interventions is used for NSLBP, but there is no study which is proved to be the most valid treatment, and producing desired effects for NSLBP among adolescents. This thing is just because of multiple causes and risk factors of NSLBP that is not corrected by the identical intervention methods. The intervention for NSLBP is defined by three methods, first and effective intervention method is exercise and physical therapy, second is conditioning of patient with proper diet maintenance, and third is psychosocial interventions. Another treatment plan which produce desired effect is manual therapy and self-mobilization. Emotional therapy can also play a key role in NSLBP [5]. Electrotherapy for NSLBP includes ultrasound, interferential, laser, and TENS. Pharmacological therapy includes opioids, NSAIDS, and anti- depressants [3]. Being less defined problem non-specific low back pain is considered as community health problem among adolescents[6]. Children and adolescents are less common to experience LBP and therefore often consider as a threat of grim organic disease [13]. According to studies as much as 10% to 40% of adolescent's daily activities are affected by LBP [14, 15]. Low back pain affects each area of an individual's life with bio-psychosocial consequences. Socio-psychological elements have been exposed to forecast conclusion in chronic LBP [16]. The influence of disability is not only by the core physical mutilation, but also by the patient's attitudes and beliefs, psychological distress and type of occupation [17]. Early detection of clinical, psychosocial and professional elements is crucial to evade the succession to chronic LBP. It is important and needful to view NSLBP as a multi-factorial pain syndrome. NSLBP is a reason for disability expressed as a combination of physical impairment and psychosocial factors. To determine the frequency of non-specific low back pain among school going adolescence in Peshawar.

METHODS

The Cross-sectional study design was used in this survey, which find out prevalence at one point in time in which we observe. Study setting includes different schools of Hayatabad Peshawar which include: ICMS (Institute of computer and management sciences), FCA (frontier children academy), FSA (frontier science academy), HMS (Hayatabad model school). The data were collected from these institute. The duration of the current study is six months that is from May 2017 to November 2017. Sample size consisted of 202 participants in which 150 were male students while 52 students are females. Consecutive sampling technique: It was used in this study. Consecutive sampling is a technique in which every subject meeting the criteria of inclusion is selected until the required sample size is achieved. In This Study the participant who fulfill the criteria having Age 10 to 19 years of both genders Students of Hayatabad Schools in Peshawar and those who were willing to participate in the study. Those students were excluded from the study those who have recent trauma i.e. accident, fracture and recent surgery i.e. appendectomy.

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First ethical approval was taken from the schools of Hayatabad Peshawar. After permission data was collected from different schools situated in Hayatabad, Peshawar. Permission letter was collected by the head of the school to collect the data, the students were informed and briefed about their participation in the research and proper consent was taken by the participants Total 202 questionnaires were distributed among respected schools of Peshawar. Each and every questionnaire i-e 202 was fully filled and returned with full information. Data collection procedure takes one month. Data were keenly collected by all the students from schools. After this procedure of data collection data were analyzed by SPSS (version 23.0). "The Modified Hanover Low Back Pain Disability Questionnaire" The questionnaire was verbally translated to the local language for the ease of the participants. Hanover disability questionnaire assessed its impact on physical function. This is 9-item questionnaire scored 0-9 where higher score represent greater disability. The Statistical Package for Social Sciences (SPSS) version 23.0 was used for statistical data analysis. Results were expressed in frequency, mean and standard deviation. Results were shown by tables and graphs. Pie and bar graph were used in data analysis procedure. Cross tabulation was also used in this study.

RESULTS

Our study included a sum of 202 school going adolescents. The study was conducted in different schools of Hayatabad Peshawar to evaluate the prevalence of low back pain among school going adolescents. The results were as follow. Upon analysis the results showed a high prevalence of non-specific low back pain, 108 out of 202 reported to experience LBP. Total 94 out of 202 reported to have no NSLBP, as shown in table 1

Low back pain	N (%)
Yes	108 (53.5%)
No	94 (46.5%)
Total	202 (100%)

Table1: Showing Prevalence of NSLBP

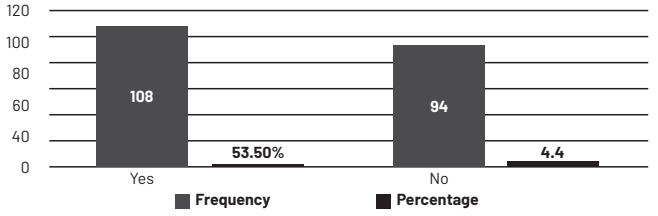

Figure 1: Graph Presenting NSLBP

Upon Wong-Baker faces rating scale majority of the participants (84) reported that they perceived their pain to be between the values of 4 to 6. Total 17 subjects reported that they perceived their pain to be between the scales of 0 to 2. Only 10 subjects perceived the pain to be severe and they reported to have pain between scales of 8 to 10. As shown in figure 2.

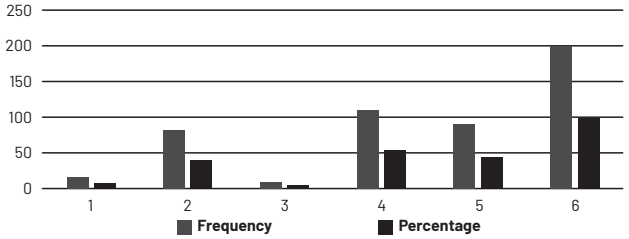

Figure 2: Graph Showing Pain Scale

Most of the participants (64 subjects) reported to have low back pain from last 12 to 24 hours. 17 subjects reported to have pain duration from 1 to 7 days. 11 subjects reported to have LBP duration greater than a week. as shown in table 2.

Duration	N (%)
Less than12	4 (2%)
12-24 hours	64 (31.7%)
1-7 days	17 (8.4%)
Greater than week	11 (5.4%)
Total	111 (55%)
System	91 (45%)
Total	202 (100%)

Figure 2: Graph Showing Pain Scale

The students from ICMS School Hayatabad Peshawar showed higher percentage of low back pain, 73 pupils from this school were victim of NSLBP. Second most common school was FCA total 58 students from there reported NSLBP.HMS showed that 49 students were sufferers of NSLBP. The lowest prevalence rate was of FSAI-e 22, students reported to have NSLBP. As shown in table 3

Schools	N (%)
HMS	49 (24.3%)
FCA	58 (28.7%)
FSA	22 (10.9%)
ICMS	73 (36.1%)
Total	202 (100%)

Table 3: Showing Number of Participants with NSLBP from Different Schools

The results showed as the age escalates there is an increased chance to develop low back pain Participants between the ages of 10 to 15 years old showed that only 53 of 106 has LBP. On the other hand, participants of age ranging 15 to 19 years showed that 55 out of 96 had experienced low back pain.as shown in table 4

Age	Low Back Pain		Total
	Yes	No	
10 to 15	53%	53%	106
15 to 19	55%	41%	96
Total	108%	94%	202

Table 4: Cross tabulation showing association between age and low back pain

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It was found that male participants who were recruited in this study were more frequently complained for low back pain 75 of 150 reported to have LBP. Whereas female participants were less likely to have LBP 33 out of 52 reported to have low back pain. This showed that NSLBP is highly common among male gender, as shown in table. as shown in table 5

Gender	Low Back Pain		Total
	Yes	No	
Male	75	75	150
Female	33	19	52
Total	108	94	202

Table 5: Cross tabulation showing association between gender and low backpain

DISCUSSION

The current study shows the prevalence rate of non-specific low back pain among school going adolescents is 53.5%, which is similar to Balagué et al. Who reports life time prevalence rate of NSLBP to be 58% for adolescents [18]. Similarly, Jones et al reported the prevalence to be 16% in children while 65.6% in 16-year-old adolescents [19]. A Nigerian study reported prevalence of low back pain to be 40.7 % [9]. In contrast to this another study shows a low prevalence rate of NSLBP i.e., 36% [20]. Whereas Fair bank et al. in his study reports LBP to be 26% prevalent in adolescents [21]. The current study shows that age ranging 10 to 15 years were most frequently experiencing low back pain, this coincides to the results of Akinpelu A.O et al. who reports that students of age ranging 12 years to 14 years are common prey of LBP [9]. Brownlee S et al also explain this fact in his study that LBP is common among student age ranging 13 to 14 years. [30] Khanzada et al also reported that majority of the students between 10 to 12 years were the common victim of non-specific low back pain [8]. Balagué et al. reported that prevalence of NSLBP increases from the age of 12 and onwards [21]. Fairbank JC his study reports that NSLBP is common in adolescents of age between 12- to 19-year-old [22]. Yao *et al*. who reported that the incidence of NSLBP was prominent; 29.1% of Chinese pupils aged 10 to 18years were going through from this state in the past 3 months. Balague F et al. reported an augment in the lifetime prevalence of Lumbar pain from 23% among children aged 6–13 years [23]. Current study shows the condition is common in 10- to 15-year-old. This synchronizes with all the other literature. The current study shows a higher prevalence rate (74.3%) of male gender in regard to experiencing nonspecific low back pain. Burton et al. reported a prevalence of back pain of 52.6% among boys and 34.3% among girls [24]. Newcomer and Sinaki also proved that prevalence of lumbar pain is more common among males (57%) as compared to females (44%) [25]. Fairbank JC et al. revealed that 55.8% of male were experiencing LBP whereas only 44.2% girls reported LBP [22], Olsen et al as well found that male participants were most commonly affected by NSLBP in his study [11]. In the current study 41.6% reported their pain intensity to be between 4 to 6 score on the visual analogue scale, there is no significant literature about the pain intensity on visual analogue scale in other studies.

CONCLUSIONS

The conclusion of the study is that NSLBP is a common condition among school going adolescents. The increasing age is a frequently observed cause in our study hence more attention should be paid to this specific age group.

Authors Contribution

Conceptualization: NUR
Methodology: QU
Formal analysis: NU
Writing-review and editing: MA, NUR, QU

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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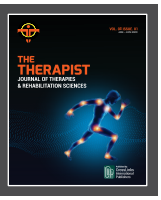

Original Article

Effect of Posteroanterior Lumber Spine Mobilization Versus McKenzie Prone Push Ups on Pain and Functional Disability in Subjects with Non-Specific Low Back Pain

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ABSTRACT

85% of the population has non-specific back pain. Posteroanterior (PA) lumbar mobilization and Push-up exercises are primarily used in physical therapy for back pain. **Objective:** To know the outcomes of posteroanterior spinal mobilization and prone push-ups on nonspecific lower back pain. **Methods:** The randomized clinical trial was done with 30 subjects meeting inclusion criteria and were randomly selected by non-probability/purposive sampling technique from the Department of Physical Therapy, Mayo Hospital Lahore. The 4 weeks study was conducted in which 2 groups with 15 in each group were formed. Group I was treated with PA lumbar glide while group II was treated with prone Push-ups. VAS and functional disability index were used to evaluate pre-treatment and post-treatment. **Results:** A significant decrease in mean pain score was noted in both groups. Results did not show any statistically significant differences between groups for any parameter. The study has given evidence that supports the use of posteroanterior mobilization and prone push-ups to reduce pain, improve range of movement, and disability reduction in patients with nonspecific low back pain. It also showed that posteroanterior mobilization was more beneficial than prone Push-ups. **Conclusion:** Both PA mobilization and Push-ups can be used as effective maneuvers for the treant of non-specific low back pain.

INTRODUCTION

Back pain with no known pathological cause is called nonspecific back pain [1]. Nonspecific low back pain is the most common of the leading causes of limitation, absenteeism, and increased health care costs [2, 3]. Non-specific back pain is a growing public health problem worldwide [1, 4]. Lifetime incidence of back pain is reported to be up to 84%, persistent back pain is about 23%, and 11-12% of the population is disabled by back pain. Mechanical variables such as lifting and carrying are unlikely to contribute significantly to virulence, but genetic reflections are important [5, 6]. Maitland's idea is the utilization of latent and assistant oscillatory developments to vertebral and spinal joints. The goal of this procedure is to restore torsion, rotation, and torsion between the articular surfaces, which are checked by amplitude [7, 8]. Posteroanterior focal vertebral strain can be utilized to treat disease which is similarly disseminated to the two borders of lumbar spine. This procedure is indicated when pain or muscle spasms are detected in development to this pathway, however acted in such a way disease or fit isn't restored. This strategy is of worth in patients where there are primary changes related with imperfect stance [7, 9].

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They may have used a more common approach of using prone Push-up exercise for decreasing pain and to increase spinal motion [10, 11]. They set up a new idea of analysis and cure based totally on evaluation of patients with both chronic and acute lower back pain [12, 13]. Mackenzie states that all mechanical back pain can be categorized into three syndromes: posture, dysfunction, and confusion [14, 15]. A previous study was conducted to correlate the efficacy of push-ups with post-anterior lumbar mobilization. No studies were performed to confirm their effects. Therefore, the aim of this randomized clinical trial was to determine the efficacy of lumbar PA mobilization and prone push-ups for pain and disability episodes in patients with nonspecific low back pain.

METHODS

The study of randomized clinical trial was done in the Physical Therapy Department of Mayo Hospital Lahore. This study included the patients having nonspecific low back pain, above 15 years and below 70 years of age. Exclusion criteria for this study consisted of a spinal tumor or metastasis, recent trunk fracture, inflammatory spine disease, neurological problem, heart problems, current abdominal surgery within the last 2 years, hip arthroplasty or knee arthroplasty, or evidence of metal grafts, current venous thrombosis, gallstones, kidney stones, balance problems. disc protrusion or herniation, neuropathic pain, referred pain and pathological pain. For sample size Win Pepi: version 11.0 was used, with confidence interval of 90%, power of study 80%, sample size ratio B:A 1, SD = 0.93 for group A and SD = 0.93 for group B. We detected a difference of 0.99 by 0.79 (from the study of Ikram et al.,) [3]. The required sample size was total = 30 (15 for A and 15 for B). The non-probability/purposive sampling technique was used, but all members were randomly allocated to one of two groups throughout the study. Thirty participants who completed selection criteria are included in this study. Informed written consents were taken from every individual participating in this study before performing any physical examination. Allocation of patients in two groups was through simple random sampling by lottery method. 30 subjects were separated into 2 equal groups with 15 subjects in each group. 15 patients were allocated into group A and treated with Maitland Grade II lumber mobilization and 15 were allocated into group B and treated with McKenzie prone Push up treatment. All the 30 patients finished entire procedure as defined by treatment of 4 weeks. Data is gathered on the first day before the application of interventions and then information accumulated after four weeks the application of intervention. In Group I, the PA mobilization was performed. The subjects were in the prone laying and hands were on both side of the treatment couch. The force was applied downward, and every lumbar vertebra was subjected to the 40 seconds of vibration. Maitland mobilization grade II of 1–2 Hz were performed with three sets. The total time of procedure was approximately 10 minutes. Prone Push-up exercises were recommended for Group II. Subjects were instructed to do a prone Push -up exercise, with the participants using their upper limbs to push their upper body up into spinal extension, allowing their pelvis to drop and stay on the treatment couch. The participants were trained to change its position from prone to the maximum pain-free position before the participant proceeds to the preliminary position. Total Ten repetitions were completed. The total of 10 minutes time for the prone Push-up exercise was. Treatments were administered five times per week for four weeks and comprised of three sets of ten repetitions with 30-second break. Pain was measured with VAS and functional disability was measured with MODI questionnaire. Statistical analysis is done to examine the effect of the intervention applied to the Participants of both groups. For data analysis IBM SPSS.21.0 version was used. Statistical tools for parameters between the groups, independent sample t-test was used and for parameters within the same group paired sample t-test was used. All descriptive measures with p-value less than 0.05, (standard deviation, mean) was recorded.

RESULTS

The table 1 showing that in group 1 the mean pre value of VAS is 7.73 and mean post value of VAS is 3.53. The mean pre value of MODI is 48.80 and mean post value of MODI is 22.90.

Paired Samples Statistics N=15		Mean ± SD	Std. Error Mean
Pair 1	pre value of VAS	7.73±2.154	.556
	post value of VAS	3.53±1.246	.322
Pair 2	pre value of MODI	48.80±13.518	3.490
	post value of MODI	22.93±7.478	1.931

Table 1: Paired sample T test of Group 1

The table 2 showing that in group 2 the mean pre value of VAS is 6.67 and mean post value is 5.20. The mean pre value of MODI is 49.33 and mean post value of MODI is 41.

Paired Samples Statistics N=15		Mean ± SD	Std. Error Mean
Pair 1	pre value of VAS in group 2	6.67 ± 1.915	.494
	post value of VAS in group 2	5.20 ± 1.568	.405
Pair 2	pre value of MODI in group 2	49.33 ± 15.017	3.877
	post value of MODI in group 2	41.33 ± 13.494	3.484

Table 2: Paired sample T test of Group 2

The table 3 shows that the mean post value of VAS in Maitland mobilization is 3.53 and mean post value of VAS in McKenzie prone Push-ups is 5.20. The mean post value of MODI in Maitland mobilization is 22.93 and the mean post value of MODI in McKenzie prone Push-ups is 41.33.

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Group Statistics N= 15	study group of participants	Mean ± SD	Std. Error Mean
post value of VAS	Maitland mobilization	7.73±2.154	.556
	McKenzie prone Push ups	3.53±1.246	.322
post value of MODI	Maitland mobilization	48.80±13.518	3.490
	McKenzie prone Push ups	22.93±7.478	1.931

Table 3: Independent sample t-test

DISCUSSION

In the past, the age range was from the 20s to the 50s. Individuals over the age of 50 are more prone to LBP(low back pain) due to induced physical variations in aging [16, 17]. Typically, each group was introduced to one key analgesic over a 4-week session. Once the within-group implicit score of the VAS) were studied, a statistically big magnitude was previously observed in each group prior to intervention implementation. Although he was 4 weeks post-intervention, he performed one assessment between groups, and he observed a significant statistical difference in pain relief among both groups. Posterior Anterior Spine Mobilization has proven the highest quality in a series of pain relief [18]. In the current study, the pain decrease levels calculated using the VAS is reliable with the individual usefulness of posteroanterior glide and prone push-ups, although results from previous studies like Powers *et al.*, suggest that both strategies It has been shown to reduce back pain [12, 13]. Repetitive motion identified by Mow and Hung is a concept that delivers synovial fluid to the intervertebral discs and articular cartilage, ensuing in to a lesser extent resistance to movement. patients can walk freely, resulting in much less pain [19]. It supports this study Powers *et al.*, After he gave 1-minute spinal mobilization courses to a patient with non-specific LBP, she found that minimized pain by 36% [12]. Similarly, as showed in this study Goodsell *et al.*, results of PA mobilization for non-specific LBP were further examined and suggested an typical reduction in pain of 33% [20]. The current study used 3 1-minute postoanterior mobilizations at L3 level, L4 level, and L5 level to state a 7.1% rise in lumbar extension recorded with two liquid-based inclinometers. One more Bronfort *et al.*, review reported proof that spinal manipulation (SMT)/ (MOB) is prefer to conventional physician care for temporary pain relief [21]. This study also showed results in decreasing pain by spinal mobilization. The most frequently used questionnaire to assess disability in people with back pain is Modified Oswestry Disability Index (MODI) [15, 16]. MODI has displayed more reliability and is broad enough to reliably identify enhancement or decline in most participants. In an existing study, analysis of within-group Modified Oswestry Disability Index(MODI) skills showed statistically significant improvement once in each group, and the MODI score, which represents improvement in pain and goal-directed activity, was significantly improved. showed a decrease. It was that the selection criteria limited generalizability. Impact on all back pain populations Patient activity stage is no longer considered

CONCLUSIONS

In conclusion, existing randomized clinical trials provide evidence that the use of posteroanterior spinal mobilization and prone push-ups can help in reduce disability and relieve pain in patients with non-specific LBP. Furthermore, the results supported the benefit of early posteroanterior mobilization over prone push-ups for reducing disability and pain in patients with non-specific LBP.

Authors Contribution

Conceptualization: SA
Methodology: IAZ, AAR
Formal analysis: NG
Writing-review and editing: IA, QI, SA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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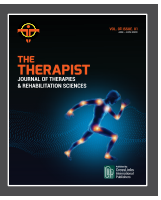

Original Article

Psychological Well-Being and Care Giver Burden of Parents Having Child with Leukemia

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ABSTRACT

Leukemia is one of most prevalent type of cancer among the children with age less than 15 years. Worldwide, Leukemia represents 32.5% of all types of cancer among the children. In Pakistan, 46.5% child with cancer diagnosed with leukemia. Both the mother and father are involved in the direct and indirect care of their child with leukemia Direct care is the tasks with the care of the child with leukemia and indirect care is the financial support and the facilities provided to the patients. **Objective:** To determine the psychological wellbeing and Care burden among parents having Children with Leukemia. **Methods:** A cross-sectional study designed was used. A sample of n=81 participants was recruited from Sadiq Abbasi Hospital Bahawalpur, through convenient sampling. The psychological wellbeing and care burden questionnaires were used to measure care burden and psychological wellbeing among parents having children with leukemia. Filled questionnaires were entered and analyzed through SPSS version-21. **Results:** Findings revealed that 71.60% participants had poor psychological wellbeing, 18.51% had fair and only 38.27% had good wellbeing during their children leukemia care. Similarly, 12.34% had low care burden, 38.27% had moderate and majority 49.38% were having high care burden. **Conclusions:** Majority of the parents of children with leukemia in this study were having high care burden and poor psychological wellbeing while taking care of their children.

INTRODUCTION

Childhood cancer is the cancer among children with age between 0 to 14 years old. Cancer is the main cause of death among children. Approximately, 80% cancers in children have been reported in low- and middle-income countries due to the limited treatment resources [1]. Cancer is the basic health problem of concern worldwide and considered among the leading cause of mortality and morbidity. Cancer is among chronic diseases and is the second leading cause of death [2]. Worldwide, approximately, 443.4 per 100,000 children affected from cancer every year. Eventually, the mortality rate of cancer is estimated 158.3 per 100,000 men and women [3]. Among the children population the mortality rate is very high. In develop the mortality rate among the children with cancer is around 20% while the low and middle-income countries the mortality rate among the children population with cancer is around 80% [4]. Similarly, the mortality rate varies on the early screening of cancer and treatment regimen to the patients [5]. In developing countries like Pakistan, cancer represents high statistics. A total of 22,858 cases of cancer among children were registered in Pakistan during 2010-2019 [6]. Leukemia is one of most prevalent type of cancer among the children with age less than 15 years. Worldwide, Leukemia represents 32.5% of all types of cancer among the children [7]. In Pakistan, 46.5% child with cancer diagnosed with leukemia [8]. Chemotherapy is the basic and primary treatment option for pediatric leukemia patients. Chemotherapy prevents the proliferation of cancerous cells and prevents the spread of cancer. Similarly, chemotherapy is a cytotoxic medication with severe side effects and problems [9]. Among these problems the most common are Oral mucositis, weakness,

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hair loss and gastrointestinal problems which increase the care burden of caregivers [10]. Similarly, Leukemia is a chronic disease with a variety of symptoms and severe problems. The children with leukemia experience a variety of problems with is associated with the disease and its treatment. These complications are nausea, fatigue, vomiting, fever, weight loss, pain, bladder and bowel dysfunction, skin changes, oral sores and thrushes, bleeding and tissues masses [11]. Both the mother and father are involved in the direct and indirect care of their child with leukemia [12]. Direct care is the tasks with the care of the child with leukemia and indirect care is the financial support and the facilities provided to the patients [13]. The parents are mostly involved in the care of the children and to deal with all the complications associated with the disease and treatment. Therefore, similar to other chronic diseases, parents of children with leukemia also experience mental and physical problems such depression, anxiety and disappointment [14]. Care burden among parents of children with leukemia effect the quality of life and psychological wellbeing of parents. Several psychological problems such as stress (21%), mild anxiety and depression (95%) is commonly prevalent among the parents of children with leukemia [15]. Different studies reported that leukemia among the children affect the psychological wellbeing of the parents. The majority (60%) of the parents of children with leukemia experience psychological consequences. Several psychological distresses such as transitioning back to life as it was before the diagnosis, Emotional scars, Uncontrollable fears and worries of diseases, and new perspectives on life among the parents are experienced [16]. Similarly, various studies reported that caregivers especially the parents experience high level of care burden. The care burden results in painful experiences such as weeping, social isolation, avoidance, social relationship reduction, fatigue, unwilling to talk, decline in quality of life and decrease appetite [17]. The parent's role changes after the involvement in the care of the children with leukemia. Also, the parents adopt a new role as a member of the caring and treatment team [18]

METHODS

The aim of this descriptive study was to determine the Psychological Well-Being and Care Giver Burden among parents having children with leukemia. In this regard, a descriptive cross-sectional study was conducted to determine this care burden and psychological wellbeing. A cross sectional descriptive study was conducted to carry on this study. This study was conducted at the oncology unit of Sadiq Abbasi Hospital Bahawalpur. All the parents of pediatric patients with leukemia visit oncology unit of Sadiq Abbasi Hospital Bahawalpur were the targeted population. A convenient sample of n=81 participants was recruited. Sample size of 81 cases is calculated with 95% confidence interval, 7% margin of error and expected percentage of post interventional psychological well-being among parents having child with leukemia is 88.3% (Mahmoud & Elaziz, 2015).

$$n = [z^2_{1-\alpha/2} P(1-P)] / d^2$$

Where, $1-\alpha$ 95
P 0.883
d 0.07
n 81

Bothe parents who were primary caregivers were recruited with following characteristics. All the parents of children who were diagnosed with acute leukemia and on chemotherapy treatment. Parents between age 25 to 55 years. Participants of both gender male and female parents. Parents who were able to read and write. Parents without any mental illness. Individuals with following characters were excluded. Terminally ill parents were excluded from the study. The parents who were unwilling to participate in the study. The parents who were not actively participating in the care of the child. The rules and regulations set by the ethical committee of The University of Lahore were followed while conducting the research and the rights of the research participants were respected. Permission was taken from head of the Department of Pediatric Oncology wards of Saadiq Abbasi Hospital Bahawalpur. Written informed consent was taken from all the participants. All information and data collection were kept confidential. Participants were kept anonymous throughout the study. Data were collected using three parts of a questionnaire. Part "A" consisted of socio-demographic profile of the participants. Part B consisted of Physiological well-being using Ryff's Psychological Well-Being Scales (PWB). Ryff's Psychological Well-Being Scales was an 18 items Likert scale questionnaire. The questionnaire was answered in 5 points ranging from strongly disagree to strongly agree. The reliability of the questionnaire was checked, and it was 0.91. Care burden of the parents was assessed using Care Burden Scale (CBS). The scale was developed from a study carried out by Hossein Karimnejad. Caregiver burden scale consisted of 22 questions. Each question was answered as Never, Rarely, Sometimes, Frequently and Nearly Always. The caregiver burden was categorized as: 0 to 20 = little or no burden; 21 to 40 = mild to moderate burden; 41 to 60 = moderate to severe burden; 61 to 88 = severe burden. The reliability (Cronbach's alpha) of the scale was 0.94. All participants were given close ended questionnaires along with further detailed sheet of information. A written consent was implied to every participant along with the questionnaire. Introduction to every participant was done.

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Participants were questioned individually at the pediatric oncology department of the given hospital where the assessment of the participants was done using data collection tool. After data collection it was entered and analyzed in SPSS version-21. Quantitative variables were presented in the form of mean ± standard deviation. Qualitative variables were presented in the form of frequency and percentages. Frequency distribution tables were used to present the psychological wellbeing and care giver burden among the study participants.

RESULTS

Table 1 revealed that 9.87% of the research participants were between the ages of 25-35 years age group, 76.54% were 35-45 years of age and remaining 13.58% were 45-55 years of age. It was also found that 90.13% participants were mothers and 9.87% were fathers. Furthermore, it is also shown that that in according to educational status 12.34% of the study participants were illiterate, 35.80% were primary, 38.27% higher secondary and 13.58% participants were graduated and above.

Table 1: Demographic characteristics of the participants (n=81)

Demographic	F (%)
Age	
25-35 Years	8 (9.87%)
35-45 Years	62 (76.54%)
45-50 Years	11 (13.58%)
Gender	
Father	8 (9.87%)
Mother	73 (90.13%)
Gender	
Illiterate	10 (12.34%)
Primary	29 (35.80%)
Higher Secondary	31 (38.27%)
Graduation& above	11 (13.58%)

Above table 2 indicated the psychological wellbeing among the study participants. Findings revealed that 71.60% of the participants had poor psychological Wellbeing while caring for leukemia child, 18.51% were having fair psychological Wellbeing and only 10.89% of the study participants had good psychological wellbeing regarding leukemia care and caring children with Leukemia. This finding indicated that a majority of the participants who were having children with Leukemia were having poor psychological wellbeing.

Table 2: Psychological Wellbeing among parents Having Children with Leukemia n=81)

Demographic	Frequency (%)
Poor Psychological Wellbeing	58(71.60)
Fair Psychological Well being	15(18.51)
Good Psychological Well being	08(10.89)

Above table 3 indicated the care burden among parents having children with Leukemia. Findings revealed that 12.34% of the participants were having lower care burden while caring for their Leukemia children, 38.27% were having moderate care burden while taking care of their Leukemia children and almost half only 49.38% were having high care burden during taking care of their Leukemia children. This finding indicates that a majority of the participants caring for their leukemia children were having high care burden during care.

Table 3: Care Burden among Parents Having Children with Leukemia(n=81)

Status	Frequency (%)
Low Care Burden	10(12.34)
Moderate Care Burden	31(38.27)
High Care Burden	40(49.38)

DISCUSSION

The results of the present study as demonstrated in table 1 that the majority of the study sample 76.54% were aged (35–45) years old. Also, majority 90.13% participants were mothers and more over it was also shown that 35.80% were primary and 38.27% higher secondary. A similar study was found conducted by Mohamed Mustafa *et al.*, where 56% were age 30 to 45 years of age. Similarly, 69.90% of the care providers were females in same way as in current study [19]. Similarly, education status was also consistent with the current study where 12.6% of the study participants were till primary education and 66% were middle and high [20]. In contrast, a previous study found that the majority of the study sample 52.9% (99/187), and 11.8% (22/187) of parents were diploma and academic education, respectively. aged (18–27) years old; that their level of education was read and write estimating as 67(45.3%)[21]. Findings of this current study revealed that 71.60% of the participants had poor psychological wellbeing while caring their leukemia children, and only 10.89% of the study participants had good wellbeing regarding leukemia and caring children with leukemia. This finding indicated that majority of the participants who were having children with leukemia were having poor psychological wellbeing during care of leukemic children. In consistent to the current study, a past study found that 84.83% parents of children with leukemia experience some sort of psychological problems associated with the disease and treatment. Besides, physiological distress, depression, poor relation among the spouses, incompetence, and fear of child loss was reported by the parents of child with leukemia [22]. Similarly, the findings of the study by Wiener *et al.*, reported that cancer of child effect three main domains of parents such as parental behaviors, spouse relationship, and mental health [23]. Findings of this current study revealed that 49.38% of the participants were having high care burden regarding caring their Leukemic children, 38.27% were having moderate care burden during care of their Leukemic children. This finding indicated that a majority of

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the participants caring for their Leukemia children were having high care burden. Similarly, a past study by Arab *et al.*, found that care burden score was 56.43+9.32 and ranged from 0 to 88. 10.7%, 79.7%, and 9.6% of parents had low, moderate and high care burden, respectively. Another study found that the findings of the study revealed that the parents experience significant care burden (p=0.000)[24].

CONCLUSIONS

The majority of the parents of children with leukemia in this study were having high care burden and also poor psychological wellbeing. The nature of disease and parents' role and responsibilities make it difficult for them to manage and their care burden increases, and they become weak psychologically.

Authors Contribution

Conceptualization: RG
Methodology: AA
Formal analysis: HS
Writing-review and editing: RG, AA, HS

All authors have read and agreed to the published version of the manuscript.

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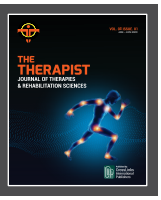

Original Article

Challenges Faced by Speech Language Pathologists as Entrepreneurs: A Thematic Analysis

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ABSTRACT

Speech language pathology is a new profession in Pakistan. With cultural & linguistic variations, SLP entrepreneurship in Pakistan needs to be augmented to reach the needy as well as economic growth of the country, hence challenges need to be identified. **Objectives:** To determine the challenges faced by Speech Language Pathologists in becoming entrepreneur. **Methods:** This qualitative exploratory study was conducted at Riphah International University, Islamabad from April 2019 to Sept. 2019. Study recruited N=15 speech language pathologists of both genders, aged 25-50 years, running their own private clinics using purposive sampling. Individual interviews were conducted using interview guide with 11 structured interview questions. Audio recording and note taking methods were used for data collection. Data was transcribed and thematic analysis done manually & verified. **Results: S**tudy with a sample of N=15 Speech Language Pathologists mostly 11(73.33%) highly qualified females with most 14(93.33%) with master's degree & 10(66.67%) with < 10 years' experience came up with an array of rich data. Thematic analysis revealed the outcome themes in descending order with a frequency 45 for Infrastructure, 32 for Professionalism, 27 for Recruit, 26 for Inclination, 23 for Unity, 22 for Legislation, 21 for Self-regulation, 20 for Wealth, 17 for Determination, 11 for Optimism & Matriarchy each, 10 for Expertise, 8 for Customers, 8 for Obstacles and 2 for Ethics. **Conclusion:** The five most common and eminent issues/ themes faced by Speech therapists as an entrepreneur in descending order of their frequency include infrastructure, professionalism, recruit, inclination, & unity.

INTRODUCTION

Entrepreneurship plays an important role in economic growth of a nation by enhancing job market, productivity and result in structural improvements, and hence having positive effect on economy [1]. Social entrepreneurship which entails establishment of social values created by organizations and people who work for social innovations involving economic activity, enhancing the living standard and quality of life (QoL) is now gaining importance in healthcare system. Social entrepreneurship can positively impact job market, innovations, investment and trade in social sector, and also helps in reduction of poverty [2]. Though entrepreneurship is now increasing in the health industry however challenges and barriers are also being faced by social entrepreneurs in Pakistan with lack of awareness, education, financial resource, governmental support, competition , & risk of failure resulting in layoffs etc [1-3]. Recently there has been a surge in healthcare entrepreneurship in a number of countries where entrepreneurs can play a significant role. Salminen L et al. in a study reported dearth of education regarding entrepreneurship in healthcare with only 23 % teachers involved in teaching entrepreneurship [4]. Female entrepreneurs face further challenges including gender discrimination due to sociocultural norms, attitudes and

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policies; limitation of access to required knowledge, skills, network and markets; and dearth of business & financial facilities for females. Despite of all these barriers women are developing and making progress as entrepreneurs [5]. Religious barriers and conservatism in Pakistan are also barriers for female entrepreneurs [6]. Thus hampering their potential as entrepreneurs [7]. Even in this modern world, there is still dearth of female entrepreneurship through it has attraction for females including SLP's because it can help them become independent, fill a social gap, empower them, challenge patriarchy, increase income and wealth [8, 9]. However, they face barriers to entrepreneurship and need strategies to cater to those [3]. In healthcare entrepreneurship is becoming important and entrepreneurship is accepted nowadays. A study conducted in California by Hulbert, studied the dearth of SLP's with help of a variety of business models, since even in United States children face shortage of SLP's, which can be overcome if SLP's take a step forward towards entrepreneurship [10]. Kummer AW has highlighted the significance of concepts of business in SLP's practice, since the only way to stay in entrepreneurship and provision of services for the needy, since this is the only way to remain in business [11].According to American Speech Language Hearing Association (ASHA), knowledge and importance of effect of culture and the linguistic variation is one of the essential requirement's for SLP's entrepreneurs [12]. Speech language pathology is new profession in Pakistan with dearth of SLPs and cultural &linguistic variations SLP entrepreneurship in Pakistan needs to be augmented to reach the needy as well as economic growth of the country, hence barriers to SLP entrepreneurship need to be identified and remedial measures taken. Therefore, current qualitative study was conducted with the objective to determine the challenges for Speech Language Pathologists in becoming entrepreneur. This is of significant importance to ensure development of the profession of speech language pathology in Pakistan, equal employment chances for females, and for economic and health benefit of the community and the country.

METHODS

This qualitative exploratory study was conducted at Riphah College of Rehabilitation Sciences, Riphah International University over a period of 6 months from 1st April, 2019 to 30th September, 2019. Study was conducted following approval of research by Research Ethics Committee of Riphah College of Rehabilitation Sciences, Riphah International University, Islamabad vide registration # RIPHAH/RCRS/REC/Letter-00525 dated 18th March, 2019 and consent of all the participants SLPs. All ethical issues were addressed and data and identity of the participants was kept confidential. Purposive sampling technique has the capacity to produce rich textured data, hence it was utilized to recruit a sample of N=15 speech language pathologists, with sample estimated to ensure data saturation [7]. Sample included SLPs of both genders, aged 25 to 50 years who were running their own private clinics in different areas of Lahore city, and had qualifications from diploma to masters in speech language pathology. Confounders were controlled by "restricting" the sample to SLP's working in private clinics, in metropolitan city of Lahore, with age group 25-50 years and avoiding younger and older age groups. Individual interviews were conducted using interview guide with 11 structured interview questions which steered the discussion was backbone of the study. Interview guide development followed literature search and testing of the on two expert SLP's to achieve a corrected 11 question structured interview guide in which the questions were sequenced and easily comprehendible. Effectiveness of the interviews was maintained due to the diversity of the range of items in the interview [13]. The questions were easily understandable and arranged in a sequence. After taking appointments for interviews, interviews were conducted by the first author in a comfortable environment of their clinics and the researcher just gave enough direction to the participant to keep them on tract thus helping in exploration. Ample time was allowed for participants' response uninhibitedly. Audio recording and note taking methods were used for collection of data. Data of audio-recordings and notes were transcribed and thematic analysis done manually using Braun & Clarke REF A, 6 step framework for conducting thematic analysis. It was started with i) becoming familiar with the data and chalking down of answers of interview questions of participants, ii) generating initial codes/ keywords of answers and matching with keywords of notes taken during interviews, iii) searching and deriving themes and subthemes from keywords, iv) reviewing these themes, v) followed by designation of themes and vi) final write-up and frequency of these were also noted. SPSS version 21.0 was used for descriptive analysis of the demographic variables.

RESULTS

Current study utilized a sample of N=15 Speech Language Pathologists (table 1) with most 11(73.33%) being females with 7(46.67%) being 34-41 and 5(33.33%) being 26-33 years old with most 14(93.33%) with master's degree in SLP. Most 10(66.67%) had < 10 years' experience and were married 10(66.67%).

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Variable	Group	n(%)
Gender	Male	4(26.67)
	Female	11(73.33)
Age (years)	25 to 33	5(33.33)
	34 to 41	7(46.67)
	42 to 50	3(20)
Education	PGD	1(6.67)
	Ms(SLP)	14(93.33)
Experience (years)	<10	10(66.67)
	>10	5(33.33)
Marital status	Single	5(33.33)
	Married	10(66.67)

Table 1: Demographic Characteristics of Sample Population (N=15)

The present study came up with an array of rich data as regards the challenges faced by Entrepreneur SLP's in Pakistan. The data of thematic analysis revealed (table 2), the outcome themes which arose following in depth interview with SLPs. The outcome themes drawn from the analysis in descending order of frequency were Infrastructure, Professionalism, Recruit, Inclination, Unity, Legislation, Self-regulation, Wealth, Determination, Optimism, Matriarchy, Expertise, Customers, Obstacles and Ethics.

S.no	Outcome themes	Frequency
1	"infrastructure" is fundamental for entrepreneurship	45
2	"professionalism" is knowing how to do it	32
3	"recruit" for attitude and train for skills	27
4	Where "inclination" is present, opportunities are not needed	26
5	"unity" is strength	23
6	"legislation" is the art of compromise	22
7	"self-regulation" is beneficial for all	21
8	"wealth" makes a difference	20
9	"determination" keeps you going	17
10	"optimism" is a happiness magnet	11
11	"matriarchy" is responsibility	11
12	"expertise" leads towards success	10
13	"customers" are backbone of a business	8
14	"obstacles" do not block the path, they are the path	8
15	"ethics" is mandatory for professionals	2

Table 2: Themes and their frequency: Thematic Analysis

DISCUSSION

In current study majority 11(73.33%) of the sample were females being a female dominated profession and most 7(46.67%) being 34-41 years old with 14(93.33%) being highly qualified with master's degree holders in SLP. Most 10(66.67%) had < 10 years' experience. Current study revealed that *"Infrastructure"* was important for clinical SLP set ups and attractiveness and luxuriousness of the clinics was beneficial to attract more clients. This is in compliance to a study by Audretsch D et al.which investigated the linkage among infrastructure and entrepreneurship and reported that infrastructure is essentially linked to & significantly impacts entrepreneurship [14]. Entrepreneurship courses are essentially required with blended approach which could help them achieve required level of affective domain learning objectives [15]. This is validated in current study in which *"Legislation"* was highlighted as a theme with no registration and regulatory body for SLP's in Pakistan, the specialty is left unregulated. A theme, *"Matriarchy"* was derived from current research in which majority (73.33%) of sample comprised female gender, which supports the fact that gender wise impact of factors varies with different factors affecting number of women entrepreneurs and others affecting the share of women [16]. Though female entrepreneurs are equally important in economic growth of a nation especially developing ones, enhancing social inclusion as well as to combat discrimination and poverty [17]. SLP is a female dominated profession thus male therapists face biased attitude especially when they apply for a job. Female SLPs believe that their struggle is credible since they work harder for their entrepreneurship success compared to male entrepreneurs [18]. According to Van Wyk & Boshoff, entrepreneurial attitude is necessary and needs to be adopted to become successful [19]. Hence *"Professionalism"* also came up as a theme in the current study. It was revealed that most of the Speech language pathologists hire their staff on share basis. Literature also reveals that entrepreneurial behavior needs to be taught in educational systems [19]. Demotivating factors exist for both male and female entrepreneurs, hence motivation or *"determination"* came up as a theme and is essentially required for entrepreneurship with female entrepreneurs have higher levels of determination compared to male counterparts [20]. A local study revealed that women entrepreneurs in Paksitan are quite motivated towards entrepreneurship with factors like personal ambition, to improving personal financial position, with desire to contribute towards income of family, and to get personal satisfaction [21]. *"Expertise"* is another theme of the current study and literature seem consistent with this theme highlighting the importance of team work and referral and knowledge of critical processes including to find new entrepreneur opportunities as well as resource mobilization [22]. Meyer & Landsberg proposed that for female SLP's they should focus on marketing to reach all segments of society [8]. Obstacles do arise in businesses like a clinic both while starting a new business as well as to get social support during launching which result in stress and distress [23]. Hence *"obstacle"* was noted as a theme in current study. In medical and allied professions and health professions, ethics has a central role, same is true for

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Speech and language Pathology entrepreneurship with *"Ethics"* being a theme of present study. Similarly Lyer & Solomon reported that it is essential to adopt ethical standards when beginning and running a entrepreneurship since bypassing ethics can result in temporary benefit but significant damages in the long run. Also knowledge of regulatory organizations and laws is important to avoid legal issues [24]. *"Wealth"* is crucial and it is also a theme of this present study. The success and lavishness of an entrepreneur revolves around wealth. Similarly according to a study to collect wealth prior to entering an entrepreneurship is important and the wealth-illiquid wealth ratio is a measure of economic constraints that might be faced [25]. A theme *"Optimism"* came up since it is a happiness magnet because if an entrepreneur has an optimistic approach he or she can reach every level of success. Optimism comes from determination, hope and positive approach. This theme is relevant to a study by conducted about entrepreneurial optimism and chance. They combined the optimism and chance into a theory to describe how optimistic entrepreneurs who get chance can become successful [26]. *"Recruit"* is another theme of this study which is in compliance to a study by Storey, which revealed recruitment of surrogate entrepreneurs resulted in a better team and success of business in a Swedish technology venture [27]. A Malaysian study revealed the role fo educational institution for promotion of entrepreneurship, business curriculum and syllabus, gender, work experience and occupation of mother had significant association in inclination of students toward entrepreneurship [28]. Similarly "Inclination" was noted as a theme in current study**.** Another theme is *"Unity"* in entrepreneurship which is in compliance to a study about social capital access and entrepreneurship which helps entrepreneurs to overcome resource constraints and ultimately unity transforms a business environment into a suitable organizational culture [29]. *"Self-regulation"* is also one of the theme of the study though less explored O'Shea D et al. studied self-regulation by introducing an integrated model to map regulatory effects including action, cognition, motivation as well as emotion in entrepreneurship, making self-regulation an essential element in entrepreneurship [30]. Another theme of the study is *"customers"* and literature also supports the fact that customer is the main focus of a business and hence building a trusting relation with customers and customer's confidence is necessary for a business to succeed [31]. Population was mostly males from one city only hence study results lack generalizability.

CONCLUSIONS

Study concluded that the five most common and eminent issues/ themes faced by Speech therapists as an entrepreneur in descending order of their frequency as demonstrated by thematic analysis include infrastructure, professionalism, recruit, inclination, & unity.

Authors Contribution

Conceptualization: HSK, EJ
Methodology: HSK, EJ
Formal analysis: EJ
Writing-review and editing: HSK, EJ

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

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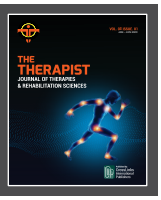

Original Article

Virtual Reality Training Improves Upper Limb Function in Stroke Survivors

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ABSTRACT

Stroke survivors with upper extremity functional limitation are particularly susceptible to problems in performing independent ADLs. Virtual Reality training has a significant contribution to enhancing the independence of stroke survivors. **Objective:** To determine the effect of additional VR training on upper limb gross motor function, gross manual dexterity, and functional activities in hemiplegic stroke survivors. **Methods:** It was a single-group experimental study in which 20 participants were recruited through non-probability convenient sampling. Participants were included in the study if they had any sort of stroke (hemorrhagic or infarct), were between the ages of 30 and 70, had at least one score on the box and block test, and did not have any cognitive deficits or uncontrolled high blood pressure. The intervention was provided three days a week for a total of six weeks. Gross motor function, gross manual dexterity, and functional capacities of the upper limb were measured at baseline, 2nd, 4th and at 6th week of intervention through Fugl-Meyer Assessment, Box and Block Test, and Wolf Motor Assessment Scale respectively. Data were analyzed through within-group inferential analysis using SPSS-21 software. **Results:** The mean age of patients was 49.45 ± 11.02 years. The scores of the Fugl-Mayer Assessment Scale, Box and Block Test and Wolf Motor Assessment Scale were significantly improved from baseline to six weeks ($p<0.05$). **Conclusion:** This study concluded that the hemiplegic stroke survivors who received additional Virtual Reality training using Xbox Kinect showed significant improvement in Gross motor Function, Gross Manual Dexterity and Functional Abilities of the Upper Limb.

INTRODUCTION

Cerebrovascular accident (CVA) is the second main cause of death, and its number is increasing day by day [1]. Stoke has two main types, ischemic 85%, and hemorrhagic 15% later one is more devastating [2, 3]. In Pakistan, it is twofold more than the rest of the world. In developing countries, stroke is the third main reason for mortality and the first main reason for disability [4]. It causes unexpected loss of balance, uncoordinated movements, difficulty in walking, and disequilibrium. CVA-related impairments include motor, sensory, speech and language, cognitive, and emotional dysfunctions. Motor impairments may include the face, upper limb, lower limb or whole side of body. Upper limb is usually more involved as compared to lower limb. Arm and hand functions are mostly impaired by stroke. Upper limb impairments are weakness, inability to perform isolated movements, increase or decrease muscle tone and alterations in superficial and deep sensations [5]. Rehabilitation of CVA survivors makes them free to work as possible and to achieve most ideal personal satisfaction. Techniques used in rehabilitation of stroke includes different concept of exercises e.g., Bobath concept, Perfetti concept, [6, 7] some other simple and single

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isolated concepts such as muscle strengthening exercise, isokinetic muscle strengthening, stretching, bimanual training, force use, constraint-induced movement therapy, mirror neuron and motor imaging technique or mental imaging technique [8-10]. Other adjunct therapies include sensory, and motor electrical stimulations and noninvasive transracial magnetic stimulations [11]. Virtual Reality (VR) is relatively new treatment approach in recovery process that uses technology which enables a person to interrelate with an artificially created environment [8]. It has four types immersive, non-immersive, fish tank, and projected [12]. Benefits of VR rehabilitation include development of interest, person can use this on his own, helps in physical and mental well-being improves cognitive abilities, enthusiasm, understanding by continuously repeating movements, self-assurance through positive support and instant feedback [8]. VR system is cheap, readily available video gaming customize according to need of person. Xbox Kinect is a very common, 3D device for playing video games that recognize user's movement using infrared camera sensors. It can even be used in home practice and can facilitate neuroplasticity [13]. The goal of this study is to investigate the effect of virtual reality-based training in the rehabilitation of stroke patients' upper limb dysfunctions.

METHODS

A six-month quasi-experimental study was conducted at Pakistan Railways General Hospital (1st Jul 2016-1st Jan 2017). IRB approval was taken from IRB&EC of Riphah International University (Reference # 00168). The study is registered in Iranian Registry of Clinical Trials (IRCT registration number: IRCT20191107045358N2). Stroke patients were recruited through non-probability convenient sampling technique. Individuals with hemorrhagic or ischemic stroke, between the ages of 30 and 70, who scored at least one on the box-and-block test were included in the study, but those having cognitive deficits, contractures in upper limb, and not having the ability to sit by their own were excluded. Complete stroke assessment was conducted of each patient and treatment was planned accordingly. Genuine informed consent was taken. Eligible patients followed treatment protocol for three days per week for six weeks. Gross motor function was assessed through Fugl-Meyer Assessment (FMA-UE), gross manual dexterity through Box and Block Test (BBT) and functional capacities of upper limb were measured through Wolf Motor Assessment Scale (WMFT). Participants received a conventional upper limb training regimen that included active and passive range of motion (ROM) exercises, weight bearing for 15-20 minutes, Electric Muscle Stimulation (EMS) for ten minutes, therapeutic stretching, and virtual reality training on an X-Box 360, details are given in table 1. Every movement performed was detected by camera and executed on LCD. Patient positioned either sitting or standing one and half or two meters away from LCD. For treatment purposes different games were selected like Tennis and Bowling from Kinect sport, and 20,000 leaks and Space pop from Kinect Adventures. Data were collected then analyzed on SPSS version 21.0 software. Demographics were analyzed through frequency tables. Within group analysis was done through paired sample t-test for Box and Block Test and Fugl-Meyer Assessment scale as per the normality of the data while Wilcoxen Test was used to determine the within group differences from baseline to Six weeks for Wolf Motor Function Test.

Table 1: Virtual reality treatment protocol for Upper Limb Training

Week	Activity	Duration
Orientation week	Orientation to exert-gaming and the specific games which will patients perform	15 minutes.
1 week	20,000 leaks	15 minutes (initially)
2 weeks	20,000 leaks (level increase according to patient's progress).	20 minutes
3 weeks	20,000 leak s+ Space Popout	15minutes+10 minutes
4 weeks	Space pop out+ Tennis	15minutes+10minutes
5 & 6 week	Tennis+ Bowling	15minutes + 15 minutes

RESULTS

Number of patients included in study was (n=20), with mean age was 49.45±11.02 years, 15 (75%) among them were male and 5 (25%) were female. Assessment of obtained data revealed that 14 (70%) of the patients had infarction and 6 (30%) of them had hemorrhagic stroke, all of them had Middle Cerebral Artery (MCA) lesions. Patients having HTN as primary risk factor were 12 (60%) and with DM were 5 (25%) individuals having both risk factors along with other risks were 3 (15%). Findings revealed that virtual reality-based training for stroke patients with upper limb dysfunctions has very positive results as significant improvements in scores of all scales used as outcome measures were observed (p-value <0.05). Details are shown in table 2. Assessment of gross motor function in terms of timing was not improved (p-value >0.05).

Table 2: Pre and post interventional analysis of outcome measures

Outcome Measures	Baseline	Week 6	p-Value
Box and Block Test	13.45±12.09	30.35±20.54	<0.001
Fugl Meyer Assessment Scale	32.50±10.75	55.75±8.52	<0.001
Grip Strength	8.30±4.48	14.60±4.59	0.001
Wolf Motor Function Test (Time)	339.93±273.32	89.89±43.80	<0.001
Wolf Motor Function Test (FAS)	42.45±7.53	60.11±12.43	<0.001
Gross motor (FAS)	22.1000 ±2.61	30.4500 ±2.91	0.003
Gross Manual Dexterity (Time)	290.7295 ±272.79	74.9825 ±41.63	<0.001
Gross Manual Dexterity (FAS)	74.9825 ±5.38	29.7152 ±10.87	0.004

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DISCUSSION

Additional VR training of 6 weeks showed marked improvement in upper limb functions, gross manual dexterity that was evaluated through WMFT, BBT and FMA-UE. Findings of present study were supported by an RCT study conducted by Saposnik *et al.*, in which additional VR training on 141 stroke patients for two weeks depicted improvement in WMFT [14]. To enhance neural plasticity any intervention provided for rehabilitation purposes should be well defined, needs lots of repetitive movements, and should be task oriented and it should not demotivate the person. X Box Kinect tool used in this study can make use all these factors for improving upper limb function [15]. In a study conducted by Jang *et al.*, chronic stroke patients were trained for four weeks using the Interactive Rehabilitation and Exercise System (IREX) VR system which was composed of video camera, cyber gloves, virtual objects and sensors. As the results of our study showed that UL functions were significantly improved with VR, results of their study also showed significant improvement in VR training group as compared to control group on Box and Block Test and Fugl Meyer scores [16]. It is observed during the present study that individual's motor recovery was good and fast as improvement was observed after every two weeks of intervention, which is confirmed by an RCT conducted by da Silva *et al.*, who concluded that VR group had rapid recoveries and improvements in values of similar scales used as outcome measures in present study [17]. In accordance with our results that showed VR training has shown improvement in the scores of FMA-UE and WMFT, results of a meta- analysis done in 2011 which included seven observational and five RCT studies revealed that 11 out of 12 studies shown improvement in the score of FMA-UE and WMFT after VR training of four to six weeks. This meta-analysis has supported results of present study, that is additional virtual reality rehabilitation is more effective for improving upper limb function in stroke patients [18]. Another systemic review of seven studies with 205 individuals compared virtual reality training with other treatment options or with no training, results shown that there was significant improvement in scores of assessment tools which are used in our study after VR training [19]. There was marked improvement seen in scoring of Box and Block test after the six weeks of virtual reality intervention. These findings of present study confirmed the results of an earlier study conducted by Sin and Lee reported increased scores of Box and Block Test in 40 Stroke patients with mean onset of seven months for six weeks of VR training [20]. Virtual reality in combination with traditional treatments is more effective than same number of traditional treatments used in rehabilitation for improving function of distal Upper Limb [21].

CONCLUSIONS

The study closes with the fact that hemiplegic stroke survivors who received additional virtual reality training using Xbox Kinect revealed significant improvement in functional abilities of upper limb. This study suggested that use of VR with traditional physical therapy may help treat stroke patients with upper limb dysfunctions. It is recommended that in future studies large sample size should be taken along with increased duration of intervention to get better results that can be generalized to all stroke survivors with hemiplegia.

Authors Contribution

Conceptualization: NS
Methodology: MAR, NA
Formal analysis: NA, MAR
Writing-review and editing: KI, ANM

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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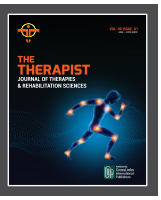

Original Article

Knowledge and Care Among Mothers Having Children with Cerebral Palsy

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ABSTRACT

Cerebral palsy (CP) is a chronic, non-progressive, and incurable disorder that affects mobility and posture. **Objective:** To assess the Knowledge and Care among mothers having Children with Cerebral Palsy at Nishter hospital Multan. **Methods:** A cross sectional study designed was used. A sample of n=85 participants was recruited from Nishtar Hospital Multan Pakistan, through purposive sampling. The knowledge and care questionnaire were used for measurement of knowledge and care among mothers having children with cerebral palsy (CP). Filled questionnaires were entered and analyzed through SPSS version 21. **Results:** Findings revealed that 71.8% participants had poor knowledge regarding CP, 21.2% had fair knowledge and only 7% of participants had good knowledge regarding CP. Similarly it was revealed that 50.6% participants had poor care, 41.2% had satisfactory care and only 8.2% were having good care for cerebral palsy children. **Conclusions:** Majority of the mothers of children with cerebral palsy in this study are unaware of the condition and show no concern for it. Support groups may be developed further to increase care giving' awareness of and concern with CP, which may aid them in finding the most suitable and timely interventions for their charges.

INTRODUCTION

In the developing fetus or immature baby brain, cerebral palsy (CP) is a chronic, non-progressive, and incurable disorder that affects mobility and posture and results in restricted behavior. Children with cerebral palsy experience a wide range of issues, including malnutrition, digestive issues, spastic paralysis, perceptive impairment, poor eyesight, and impaired speech. Additionally, they face several challenges while doing self-care activities like eating, dressing themselves, moving about, and taking a bath, which can result in a requirement for long-term care that is far greater than that of a typical kid [1]. There are 2 to 3.5 cases of cerebral palsy for every 1,000 live births. With a frequency ranging from 90 instances per 1,000 newborn survival weighing less than 1 kg to 1.5 cases per 1,000 for those born weighing 2.5 kg or more, its incidence is inversely related to gestational age and birth weight [2].

Recent research from low- and middle-income countries (LMICs) has found that the burden and severity of CP, as well as the related impairments, are higher in LMICs [3]. Within the first five years of life, children with CP accomplish 90% of their gross motor potential, and even sooner for those with severe CP [4]. Early intervention is thus critical for children with CP to achieve optimal motor and functional results. Cerebral Palsy numbers in Pakistan are equally concerning. According to a research done in Karachi, Pakistan, 658 instances were gathered from 14 health organizations between 2010 and 2016, with 383 (58.2%) men outnumbering 275 (41.7%) girls. At the end of 2016, the pattern of CP occurrence exhibited an increase in men [5]. Intellectual, cognitive, and sensory deficits, speech disturbances, seizures, dental, and dietary difficulties are all common in children with CP. To attain child

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independence and community involvement, care of children with CP requires a multidisciplinary and integrated approach [6]. For parents or caregivers, learning that their kid has a permanent condition such as cerebral palsy (CP) can be devastating. It's frequently accompanied with emotions of pessimism, worry, and the dread of the unknown. Furthermore, CP is the most prevalent childhood impairment globally, and it is a lifelong disorder with a complicated and diverse presentation [7]. It is believed that care givers who are more aware about CP would be better able to adjust and cope with the responsibilities of caregiving. According to studies, informed caregivers are more likely to have high self-efficacy, good psychosocial indices, and provide greater care and comfort [8]. Maintaining balance in the home requires help from family, friends, the community, or paid caregivers [9]. Although there is no cure for CP, treatment, education, and technology can improve the functional skills of children with the condition [10]. Early detection of CP, the implementation of suitable intervention programs, and the utilization of a multidisciplinary team approach have all been shown to help children with CP and are also closely associated to later performance in school and in life. Physiotherapy, speech therapy, occupational therapy, orthotic devices, behavioral treatment, surgery, and alternative therapies such as massage therapy are all now utilized to treat CP [11]. In the present era, mental disability is a major public health problem in the society. The disabled like CP children constitute a small part of the population of any society. Their upbringing, welfare and rehabilitation are obligatory for individuals closely related or committed to them [12]. The households, which have disabled persons like CP child, need to be helped by health care providers where the role of nurses becomes vital. Nurses can play their role in rehabilitation and health care training of parents [13]. Unfortunately Nurses involvement in rehabilitation care of CP children is not very visible. This study can be a beginning to the role involvement of nurses in guiding and training mothers of CP children to boost their knowledge and enhance their care [14]. Knowledge of care providers of children with Cerebral Palsy about home care in Vellore City was evaluated using an interventional research design. 40 mothers with Cerebral Palsy children were chosen using convenience sampling. The data for the study was collected using a standardized questionnaire. According to findings, the pre interventional mean knowledge score was 13.10$\pm$ 3 SD, which was considered to be poor knowledge [15]. Another study looked at the mothers' awareness of their children with cerebral palsy. The study's findings revealed that the majority of the moms evaluated had inadequate understanding regarding cerebral palsy, where 44% of the study participants had unsatisfactory knowledge and 56% had satisfactory knowledge [16].

METHODS

A descriptive cross sectional study was conducted to see the knowledge and care among mothers having children with cerebral palsy. A cross sectional descriptive study was conducted to carry on this study. This study was conducted at the paeds neurology department of the Nishtar hospital Multan Punjab. The study participants were mothers of all patients coming to neurological OPDs having children with cerebral palsy. A nonprobability purposive sample of n=85 participants was recruited based on the following criteria. Slovin's formula used for taking sample size. Total mothers of CP children = 110

If N=Population, n=Sample size, E= Margin of error

$n=N/1+(N)(E)^2$

$n=110/1+(110)(0.05)^2$

$n=110/1+(110)(0.0025)$

$n=110/1+0.25$

$n=110/1.275=85$

A round figure of n=85 was recruited. Only mothers who are primary caregivers, with age 20 to 50 years, mothers of those children who are diagnosed with Cerebral Palsy, mothers of those children who are with moderate and severe degree of severity with cerebral palsy and mothers of CP child with age 12 or below were included. The exclusion criteria was mothers as formal care givers (Nurses, Doctors), working mothers, and mothers of those children who are having cerebral palsy but do not required assistance in routine activities. The rules and regulations set by the ethical committee of university of Lahore were followed while conducting the research and the rights of the research participants were respected. Permission was taken from head of the department of Pediatric Neurology clinic and OPDs Nishtar Hospital Multan. Written informed consent was taken from all the participants. All information and data collection was kept confidential. Participants were kept anonymous throughout the study. A close ended questionnaire for assessing mothers' knowledge regarding CP was adopted from a previous study of Jacob Deepa, which consisted of 23 multiple choice questions regarding Cerebral Palsy. Each correct response was having Score of 1 while incorrect response was marked as 0 [17]. To assess the care score among mothers of cerebral palsy children, a care questionnaire was used which was adopted from a previous study of Miriam Hwang 2011. This tool consisted of total 18 statements where 12 statements were assessed on likert scale of very easy=1 to impossible=5, whereas 6 statements were assessed on never=0 to always=4 scale. Content Validity index testing was done to check the

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content validity for this developed knowledge based questionnaire and Care questionnaire. The CVI for knowledge questionnaire is (0.90), and the CVI for Care questionnaire is (0.91). The Reliability of the questionnaires are checked through Cronbach's Alpha after conducting the pilot study. The Cronbach's Alpha value for knowledge questionnaire is .773 while the Cronbach's Alpha value for care questionnaire is 0.808. All participants were given close ended questionnaires along with further detailed sheet of information. A written consent was implied to every participant along with the questionnaire. Introduction to every participant was done. Participants were questioned individually at the outpatient department of the given hospital where the assessment of the participants was done using data collection tool. After data collection it was entered and analyzed in SPSS version 21.0. Quantitative variables were presented in the form of mean ± standard deviation. Qualitative variables were presented in the form of frequency and percentages. Frequency distribution tables were used to present the emotional distress and self-efficacy levels among the study participants.3

RESULTS

Table 1 shows that 4.7% research participants were between the ages of 20-30 years age group, 76.5% were 30-40 years of age and remaining 18.8% were 40-50 years of age. It was also found that 92.9% participants were Muslims and 7.1% were Christians. Furthermore, it is also shown that that in according to educational status 23.5% of the study participants were illiterate, 27.1% were primary, 32.9% higher secondary and 16.5% were graduated and above. Moreover, the findings also indicated that 38.8% of the participants had Unconsangious marriage and 61.2% have got Consangious marriage. Regarding type of family, it was revealed that 11.8% had nuclear family, 77.6% were having joint family and 10.6% had single parent family. Majority 62.4% had cared for CP children 0-5 years , 37.6% have cared for 5-10 years and no participant was there who have been caring or cared for more than 10 years.

Demographic	n (%)
Age	
20-30 Years	4 (4.7%)
30-40 Years	65 (76.5%)
40-50 Years	16 (18.8%)
Religion	
Muslim	79 (92.9%)
Christian	06 (7.1%)
Education Status	
Illiterate	20 (23.5%)
Primary	23 (27.1%)
Higher Secondary	28 (32.9%)
Graduation& above	14 (16.5%)
Type of marriage	
Unconsangious marriage	33 (38.8%)
Consangious marriage	52 (61.2%)
Type of Family	
Nuclear family	10 (11.8%)
Joint Family	66 (77.6%)
Single Parent Family	09 (10.6%)
Years of Caring	
0-5 years	53 (62.4%)
5-10 years	32 (37.6%)
More than 10 years	00 (0.00%)

Table 1: Demographic characteristics of the participants(n=85)

The table 2 revealed the score of the participants care among mothers regarding caring CP children. They were asked about performing oral-facial hygiene (eg, brushing teeth, washing face etc) in which 37 (43.5%) stated it difficult and 48 (56.5%) responded that it is impossible. Mothers were asked if putting on shirts is difficult for them, where 3 (3.5%) responded with not easy, 50 (58.8%) responded with difficult and 32 (37.6%) stated that is impossible. When the participants were asked if taking off shirts of cp child is difficult, 8 (9.4%) of them said it is not easy, 44 (51.8%) stated that it is difficult and 33 (38.8%) said it is impossible. They were also asked about putting on pants in which 8 (9.4%) stated it is not easy, 31 (36.5%) stated it difficult and 46 (54.1%) responded that it is impossible. Mothers were asked if if taking off pants is difficult for them, where 15(17.6%) responded with not easy, 57 (67.1%) responded with difficult and 13 (15.3%) stated that is impossible. When the participants were asked if Cleaning buttocks or perineum with toileting is difficult, 31 (36.5%) stated that it is difficult and 54 (63.5%) said it is impossible. Mothers were asked if cleaning buttocks or perineum with toileting of CP children is difficult for them, where 1 (1.2%) responded with not easy, 18 (21.2%) responded with difficult and 66 (77.6%) stated that is impossible. When the participants were asked if washing upper body of CP child is difficult, 3 (3.5%) of them said it is not easy, 20 (23.5%) stated that it is difficult and 62 (72.9%) said it is impossible. They were also asked about Washing lower body in which 1 (1.2%) stated it is not easy, 18 (22.4%) stated it difficult and 66 (76.5%) responded that it is impossible.

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Statement	Very Easy 1	Little easy 2	Not easy 3	Difficult 4	Impossible 5
	F(%)	F(%)	F(%)	F(%)	F(%)
Performing oral-facial hygiene (eg, brushing teeth, washing face etc).				37 (43.5)	48 (56.5)
Putting on shirts			3 (3.5)	50 (58.8)	32 (37.6)
Taking off shirts			8 (9.4)	44 (51.8)	33 (38.8)
Putting on pants			8 (9.4)	31 (36.5)	46 (54.1)
Taking off pants			15(17.6)	57 (67.1)	13 (15.3)
Changing incontinence pads or briefs (underwear)				31 (36.5)	54 (63.5)
Cleaning buttocks or perineum with toileting			1 (1.2)	18 (21.2	66 (77.6)
Washing upper body			3 (3.5)	20 (23.5)	62 (72.9)
Washing lower body			1 (1.2)	18 (22.4)	66 (76.5)
How easy do you think it is for your child to remain sitting in a wheelchair?			1 (1.2)	55(64.7.)	29 (34.1)
Ease of transferring your child into/out of wheelchair or other surfaces		4 (4.7)	34 (40)	46 (54.1)	1(1.2)
Ease of applying orthotics (braces)		1(1.2)	47 (55.3)\	33 (38.8)	4 (4.7)
Activities in Past Month	**Never 0**	**Rarely 1**	**Sometimes 2**	**Frequently 3**	**Always 4**
How often do you think your child has had pain or discomfort during diaper or clothing changes?			3 (3.5)	42 (49.4)	40 (47.1)
How often do you think your child has had pain or discomfort during position changes?			18 (21.2)	41 (48.2)	26 (30.6)
How often do you think your child has had pain or discomfort while sitting in a wheel chair?		2 (2.4)	25 (29.4)	43 (50.6)	15 (17.7)
How often do you think pain or discomfort has prevented your child from participating in family activities?			25 (29.4)	30 (35.3)	30 (35.3)
How often do you think pain or discomfort has prevented your child from participating in school programs or community activities?			29 (34.1)	32 (37.6)	24 (28.2)
How often has your child had difficulty sleeping through the night?		31 (36.5)	34 (40)	16 (18.8)	4 (4.7)

Table 2: Descriptive results of Mothers' Care (n=85)

Table 3 indicate the knowledge among the study participants. Findings revealed that 71.8% of the participants had poor knowledge regarding CP, 21.2% were having fair knowledge and only 7% of the study participants had good knowledge regarding cerebral palsy and caring children with cerebral palsy. This finding indicated that a good majority of the participants who were having children with cerebral palsy were having poor knowledge of cerebral palsy.

Status	N (%)
Poor Knowledge	61 (71.8%)
Fair Knowledge	18 (21.2%)
Good Knowledge	06 (7%)

Table 3: Knowledge Level among Mothers Having Children with Cerebral palsy

Table 4 indicates the care among mothers having children with cerebral palsy. Findings revealed that 50.6% of the participants were having poor care regarding caring there CP children, 41.2% were having satisfactory care for their CP children and only 8.2% were having good care for their cerebral palsy children. This finding indicates that a majority of the participants caring for their CP children were having poor care practices.

Status	N (%)
Poor Care	43 (50.6%)
Satisfactory Care	35 (41.2%)
Good Care	07 (8.2%0

Table 4: Care Level among Mothers Having Children with Cerebral palsy

DISUSSION

The results of the present study as demonstrates 65(76.5%) were aged (30 – 40) years old; that their level of education was 23.5% illiterate, 27.1% primary and very few 16.5% were graduated and above. A similar study was found conducted by Moenardi *et al*. 2020 where 41.94% were age 20 to 29 years and 45.16% were age 30-39 years. Similarly education status was also consistent with the current study where 100% of the study participants were higher education or below. In contrast, a previous study found that the majority of the study sample 71(48.0%) aged (18 – 27) years old; that their level of education was read and write estimating as 67 (45.3%) [1]. This current study found that 10.6% participants were single parents which are inconsistent with a past study where the single parents were found 3.23% [18]. Findings of this current study revealed that 71.8% of the participants had poor knowledge regarding CP and only 7% of the study participants had good knowledge regarding cerebral palsy and caring children with cerebral palsy. This finding indicated that a good majority of the participants who were having children with cerebral palsy were having poor knowledge of cerebral palsy. In consistent to the current study, a past study found that the participants had poor knowledge were (38.9%), especially regarding awareness of the diagnosis of CP [19]. A different study findings were found in a study at Saudi

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Arabia where substantial lack of knowledge about the etiology and the prognosis of CP. According to that score, 50% of the studied caregivers had good level of knowledge about CP [2]. Findings of this current study revealed that 50.6% of the participants were having poor care regarding caring there CP children, 41.2% were having satisfactory care for their CP children and only 8.2% were having good care for their cerebral palsy children. This finding indicated that a majority of the participants caring for their CP children were having poor care practices. Opposite to the current study, a past study found that some participants knew little about the function and offerings of social workers. This suggests that social workers may not be properly marketing their services. Furthermore, the fathers of the children's lack of support were a major issue that necessitated social work assistance. Despite the difficulties and terrible situations they have faced, mothers maintain a positive outlook on providing care. The findings culminated in the presentation of recommendations for future study, practice, legislation, education, and support for social workers [20].

CONCLUSIONS

The majority of the mothers of children with cerebral palsy in this study are unaware of the condition and show no concern for it. Support groups may be developed further to increase care giving' awareness of and concern with CP, which may aid them in finding the most suitable and timely interventions for their charges.

Authors Contribution

Conceptualization: SP
Methodology: AA, SP
Formal analysis: SP
Writing-review and editing: SP, AA, HS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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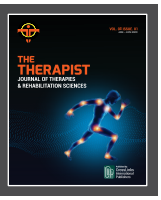

Original Article

Efficacy of Arthroscopic Debridement with Proximal Fibular Osteotomy in Early Medial Joint Osteoarthritis of the Knee

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ABSTRACT

In the USA alone, osteoarthritis affects > 3 billion people, making it the most predominant type of joint disorder. It costs the US more than $185 billion a year and is the primary cause of persistent disability in older persons. The results of our cases will help encourage local health researchers to continue this procedure and review the available resources thereof. **Objective:** To determine efficacy of arthroscopic debridement with proximal fibular osteotomy in early medial joint osteoarthritis of the knee in patients presented to tertiary care hospital. **Methods:** This descriptive Case Series was held in the Orthopedic Surgery department, MTI-Hayatabad Medical Complex, Peshawar from 30 Dec, 2020 to 30 Jun, 2021. Patients with medial knee osteoarthritis were treated by proximal fibular osteotomy combined with arthroscopic debridement. The efficacy of the knee function was evaluated by VAS score, AKSS, and ML ratio at 1 week and 3 months after operation. **Results:** As per frequencies and percentages for efficacy, 114 (69.1%) patients showed effective results of arthroscopic debridement. **Conclusion:** This study demonstrated that arthroscopic debridement with proximal fibular osteotomy is an effective procedure in the management of early medial joint osteoarthritis of the knee in terms of improved knee function.

INTRODUCTION

In the USA alone, osteoarthritis affects > 3 billion people, making it the most predominant type of joint disorder [1, 2]. It costs the US more than $185 billion a year and is the primary cause of persistent disability in older persons. The articular (hyaline) cartilage biochemical breakdown in the synovial joints causes it to primarily be a degenerative condition with inflammatory components. According to the current theory, osteoarthritis affects the synovia, subchondral bone, and articular cartilage in addition to the articular cartilage [3, 4]. Radiographic and clinical data are frequently used to make an osteoarthritis diagnosis. There are no particular clinical laboratory investigations that can be used to diagnose osteoarthritis [5, 6]. Plain radiography is the preferred imaging technique because radiographs are affordable, easily obtained, and can show subchondral bone sclerosis, joint-space loss and formation of cyst in the areas of weight-bearing [7]. In the majority of Low- and Middle-Income Countries with limited financial and medical resources, the proximal fibular osteotomy is an appropriate surgical choice [8, 9]. Uncertainty surrounds the precise workings of PFO's effectiveness. One theory for why proximal fibular osteotomy increases joint space and

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decreases pain is because it removes the fibula support that may otherwise produce genu various. One-sixth of the body's weight is supported by the fibula, therefore following surgery, PFO may rebalance or redistribute the strain on the lateral and medial tibial malleolus [10, 11]. Theoretically, arthroscopy for OA must ease symptoms by eliminating the inflammatory cytokines and debris that cause synovitis. Arthroscopic methods include debridement and lavage of the knee (e.g., smoothening of the deteriorated meniscus or shaving of rough cartilage) [12]. Debridement can remove loose cartilage flaps and meniscal fragments that have torn. Arthroscopy's significance in the management of knee OA, however, is debatable. Despite being frequently used, there isn't enough proof to support its substantial advantages. Treatment options should consider the joint mobility, patient's age, postoperative patient expectations and knee joint clearance. KOA has a large impact following arthroscopic cleanup [13]. The procedure has a success rate of roughly 70%. Patients with KOA who have high hopes for joint activities now have a better option thanks to this procedure. The outcomes of our cases will help local health researchers continue this procedure and review the resources available because, in my opinion, this procedure is simple, affordable, and effective for treating medial joint osteoarthritis of the knee and is most appropriate for patients in our local population.

METHODS

This Descriptive Case Series was held in the Department of Orthopedic Surgery, MTI-Hayatabad Medical Complex, and Peshawar from 30 Dec, 2020 to 30 Jun, 2021. The sample size was 165 selected by non-probability consecutive sampling keeping 70% proportion success of rate arthroscopic debridement with proximal fibular osteotomy with 7% margin of error, 95% confidence interval calculated on WHO formula for sample. Patients of either gender having age between 45 to 75 years age visiting Ortho Surge OPD with complaints of stiffness, joint pain, limitation and effusion of joint function and patients diagnosed for knee osteoarthritis as per operational definition. Patients undergone any other surgery or severe trauma in the affected limb confirmed on patient's history, diagnosed for rheumatoid arthritis and tumors confirmed on patient's history, and lost to follow up were excluded. First and foremost, approval was taken from the Hospital's Ethical Committee and REU Department of CPSP Karachi, after which patients meeting inclusion criteria was enrolled in the study from Ortho OPD of the hospital. After taking verbal informed consent from the patients, complete examination was carried out and demographic data of the patient was recorded. Patients with medial knee osteoarthritis was treated by proximal fibular osteotomy in combination with arthroscopic debridement. The efficacy of the knee function was evaluated by VAS score, American Knee Society Score (AKSS) (clinical and functional), and medial to lateral knee joint space ratio (ML ratio) were recorded preoperatively 3 months after operation. All the information such as age, gender, gender, age, side, disease duration, OA stage, visual analogue scale (VAS) score and efficacy was recorded on a pro-forma attached to this synopsis. Data were analyzed and entered in SPSS version 20.0. Descriptive statistics were used for data analysis. Mean and SDs was calculated for numerical variables like age, VAS Pain Score, AKSS, and disease duration. The percentages and frequencies were calculated for categorical variables like side, Efficacy and OA stage. Efficacy was stratified with age, gender and OA stage in order to see effect modifiers. Post stratification chi square test was applied keeping p-value <0.05 as significant.

RESULTS

This study enrolled 165 medial knee osteoarthritis patients. Following are the results of this study: Mean and SDs for age was 61.46+7.493 years. Mean and SDs for duration of disease was 5.52+1.33 months. VAS Pain Score after 1 week was 7.47+0.991 and decreases to 5.23 ±1.25 after 3 months. The mean functional AKSS and ML ratio after 1 week was 46.32 ±12.28 and 0.29 ±0.21 which increased to 58.22 ±13.92 and 0.39 ±0.22 after 3 months respectively. About 82 (49.7%) patients were 45-50 years of age group while 83 (50.3%) patients were 51- 75 years of age group. About 128 (77.6%) male patients and 37 (22.4%) female patients were recorded. The incidence of left side and right side of knee were involved in 48 (29.1%) and 117 (70.9%) patients respectively. Based on OA grades, there were 28 (17.0%) patients who had grade 1, 18 (10.9%) patients had grade 2, 66 (40.0%) patients had grade 4 while 10 (6.1%) patients were suffering from grade 5 OA of Knee. The baseline characteristics are shown in Table 1.

Variables	Mean±SD
Age (Years)	61.46 ±7.493
Duration of Disease (Months)	5.52±1.333
VAS Pain (Score)	7.47±0.991
Parameters	**Frequency (%)**
Age groups (years)	
45-50	82 (49.7%)
51-75	83 (50.3%)
Gender	
Male	128 (77.6%)
Female	37 (22.4%)
Side of Knee Involved	
Left	117 (70.9%)
Right	48 (29.1%)
OA Grades	
G-1	28 (17.0%)
G-2	18 (10.9%)

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G-3	66 (40.0%)
G-4	43 (26.1%)
G-5	10 (6.1%)

Table 1: Baseline characteristics of patients (n=165)

As per frequencies and percentages for efficacy, 114 (69.1%) patients showed effective results of arthroscopic debridement as shown in Table 2.

Efficacy	Frequency(%)
Yes	114 (69.1%)
No	51 (30.9%)
Total	165 (100.0%)

Table 2: Frequencies and Percentages for Efficacy of Arthroscopic Debridement (n=165)

Efficacy of arthroscopic debridement was stratified with age, gender, and OA stage/grade at Table 3 and Table 4 respectively.

		Age Groups		Total	p-Value
		45-50 Years	51-75 Years		
Efficacy	Yes	59	55	114	0.429
		72.0%	66.3%	69.1%	
	No	23	28	51	
		28.0%	33.7%	30.9%	
Total		82	83	165	
		100.0%	100.0%	100.0%	

Table 3: Stratification of Efficacy with Age Groups (n=165)

		Age Groups					Total	p-Value
		Grad-1	Grad-2	Grad-3	Grad-4	Grad-5		
Efficacy	Yes	17	10	53	26	8	114	0.078
		60.7%	55.6%	80.3%	60.5%	80.0%	69.1%	
	No	11	8	13	17	2	51	
		39.3%	44.4%	19.7%	39.5%	20.0%	30.9%	
Total		28	18	66	43	10	165	
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Table 4: Stratification of Efficacy with OA Stage / Grade (n=165)

Table 5 compares the follow-up VAS pain score, AKSS, and ML ratio after 1 week and 3 months.

Variables	Week 1	3 Months	p-Value
VAS Pain Score	7.47±.991	5.23 ±1.25	<0.001
Clinical AKSS	55.82±5.99	62.52 ±5.81	<0.001
Functional AKSS	46.32 ±12.28	58.22 ±13.92	<0.001
ML ratio	0.29 ±0.21	0.39 ±0.22	<0.01

Table 5: Comparison of VAS pain score after 1 week and 3 months follow-up

DISCUSSION

The present study mainly focused on the efficacy of arthroscopic debridement with proximal fibular osteotomy in early medial joint osteoarthritis of the knee in patients presented to tertiary care hospital and found that arthroscopic debridement with proximal fibular osteotomy is an effective procedure in the management of early medial joint osteoarthritis of the knee in terms of improved knee function. In the USA alone, osteoarthritis affects > 3 billion people, making it the most predominant type of joint disorder. The articular (hyaline) cartilage biochemical breakdown in the synovial joints causes it to primarily be a degenerative condition with inflammatory components. Numerous studies reported that osteoarthritis affects the synovia, subchondral bone, and articular cartilage in addition to the articular cartilage [13, 14]. Knee osteoarthritis is the most frequent kind of arthritis in the elderly population and a primary cause of disability. In contrast, Jewell *et. al.*, reported that with high tibial osteotomy, there is a likelihood of tibial plateau fracture and proximal necrosis in elderly patients with severe osteoporosis, hence it is not a recommended procedure for older people [15]. In the present study, the VAS Pain Score at 1 week was 7.47 ±0.991 which decreased to 5.23 ±1.25 after 3 months. However, after one week, the mean functional AKSS and ML ratio are 46.32 ±12.28 and 0.29 ±0.21, respectively, increasing to 58.22 ±13.92 and 0.39 ±0.22 after three months. Similarly, numerous studies found that clinical and functional AKSS of knee improved among patients underwent arthroscopic debridement with proximal fibular osteotomy [16, 17]. Keen *et al.*, found that there was fair variation in functional AKSS outcome. Pain relief and various alignment provided by PFO mechanism is still to be known [18]. Various parameters such as bone density, age, and bone mass decrease in load bearing joints. Tibia lateral condyle supported by fibula leads to tibial condyles non-uniform settlement with cartilage degeneration and settlement on medical side [19]. PFO reduced tibial plateau lateral half support, resulting in correction of loading force lateral shift and various deformity. The shifting of the loading force to the less deteriorated cartilage in the lateral half results in pain alleviation and functional improvement [19]. Kraus *et al.*, proposed the non-uniform settlement idea [20]. Felson *et al.*, reported that radiographic and clinical data are frequently used to make an osteoarthritis diagnosis. There are no particular clinical laboratory investigations that can be used to diagnose osteoarthritis [21]. Plain radiography is the preferred imaging technique because radiographs are affordable, easily obtained, and can show subchondral bone sclerosis, joint-space loss and formation of cyst in the areas of weight-bearing. Kraeutler *et al.*, in the majority of LMICs with limited financial and medical resources, the PFO is an appropriate surgical option. Uncertainty surrounds the precise workings of PFO's effectiveness [22]. One theory for why PFO increases joint space and decreases pain is because it removes the fibula support that may otherwise produce genu various. One-sixth of the body's weight is supported by the fibula, therefore following surgery, PFO may rebalance or redistribute the strain on the lateral and medial meniscus of the tibia. Loughlin *et al.*,

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described the risk of nerve damage following a combined tibia and fibula osteotomy [23]. Four cases of PFO conversion to total knee replacement were noted by Hunter DJ *et al.*, after a year of follow-up. The combination of a fibular osteotomy was done to improve the likelihood of successful union after the treatment. In younger individuals with osteoarthritis, the tibial osteotomy operation has long been the go-to treatment. Dagenais *et al.*, reported no conversion to complete knee arthroplasty after PFO [24]. The switch to complete knee arthroplasty was not mentioned by the other writers. According to their findings the use of PFO in conjunction with medial meniscectomy had halted the course of the disease. When PFO and HTO were put side by side, a statistically significant reduction in surgical time, hemorrhage, and complication rates was found. Additionally, it was revealed that the clinical outcome scores were better than those of the HTO group. According to Lee *et al.*, the fibula-soft tissue complex's lateral support for the osteoporotic tibia may cause non-uniform settlement and bilateral plateau degeneration[25].

CONCLUSIONS

The present study concluded that proximal fibular osteotomy is an affective, short, and safe treatment procedure for medical joint Osteoarthritis. PFO can improves functional and clinical outcomes, reduces knee joint discomfort, and raises the ML ratio. The improvements last one year after surgery.

Authors Contribution

Conceptualization: FAJ
Methodology: FAJ, MS, AU
Formal analysis: SZ
Writing-review and editing: SSA, IA, AU

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Conflicts of Interest

The authors declare no conflict of interest.

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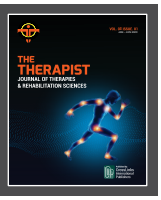

Original Article

Prevalence of Trapezius Trigger Points in Young Healthy Individuals

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ABSTRACT

MTrPs are labelled as hard, discrete, and palpable nodules in a taut band of skeletal muscle. It can be further divided into 2 forms, if it is spontaneously painful (i.e., active trigger points) or painful only on compression (i.e., latent trigger points). **Objectives:** To determine the frequency of active and latent trigger points of trapezius in healthy individuals and to find out its association with gender. **Methods:** A cross sectional survey was conducted from April 2018-August 2018 after getting approval from the ethical committee of Riphah College of Rehabilitation Sciences. The sample size was 323 which were selected by non-probability (convenient sampling) technique. Data were collected through self-structured questionnaire which also included trigger points assessment form. The data were analyzed using SPSS 24. **Results:** The mean age of participants was 23.60±4.6years with 60(19.8%) males and 243(80.2%) females. The trapezius trigger point 2 was found more active on right side (TT2Rt side) in 91(30%) and left side (TT2Lt side) 57(18.8%). While the same was more latent in 75(24.8%) on right side (TT2Rt side) and 86(28.4%) on left side (TT2Rt side) among the participants. There was no significant association between active trigger points and gender (p>0.245), as well as the association between latent trigger point and gender was not significant (p>0.740). **Conclusions:** The frequency of trapezius trigger point is less in healthy individuals whereas the majority of the young individuals have at least one or two active or latent trigger points. There was no significant association of both active and latent trigger points with gender.

INTRODUCTION

Myofascial trigger point (MTrPs) is demarcated as hyperirritable point which is situated inside a tight or inflexible band of skeletal muscle [1, 2]. As the muscle contracts or compression is applied, the spot appears to cause discomfort and becomes more painful with characteristic referred pain is presented [3]. Previous literature suggests incidence of MTrPs is very common in general population, and the prevalence is approximately thirty percent of pain patients referring to primary health care [4]. There are two types of myofascial trigger points present in muscle: active and latent. Active trigger points are concomitant with spontaneous local and referred pain [5]. They may also be associated with other symptoms such as weakness, paresthesia, or temperature changes. On the other hand, latent trigger points only induce local or referred pain when palpated and direct pressure is applied to them [6]. Latent trigger points may become activated by a variety of stimuli, including poor posture, overuse, or muscle imbalance. However, both active and latent trigger points cause loss of range of motion and weakness, which can result in limited function [7]. Furthermore, active MTrPs identified in a particular area of the body are collectively considered as a myofascial pain syndrome (MPS). Myofascial pain syndrome (MPS) is a common skeletal muscle disorder associated with regional muscle pain and tenderness, related to presence of myofascial trigger points [8, 9]. However latent MTrPs, like active MTrPs; following applied pressure might lead to allodynia at

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the trigger point site and hyperalgesia away from the MTrP and linked with peripheral and central sensitization. Both active and latent MTrPs show motor, sensory and autonomic components. Although latent MTrPs are prevalent in healthy persons and those having musculoskeletal pain, could be a source of sensory-motor dysfunction and develop into active MTrPs [9]. The clinical features which are used for the diagnosis of myofascial trigger points are localized pain due to overload or overuse of muscle, palpable band of muscle fibers are present, jump sign is present when pressure is applied on trigger point and at last range of motion is reduced due to muscle pain [10]. The signs and symptoms for trigger points include muscle weakness, muscle tightness muscle stiffness and limited range of motion [11]. Trapezius is a relatively superficial, triangular and flat muscle of upper back that extends from skull's base to lower thoracic spine and insert on the lateral third of clavicle, acromion process and spine of scapula [12]. There are three fibers of trapezius named as upper, middle, and lower trapezius. The role of trapezius muscle is to elevate and depress the scapula and helps in rotation of shoulder girdle [13]. A study by Celik and Kaya on healthy subjects has shown that there is a close relationship between the presence of trigger points and depression levels in healthy people [14]. Manoharlal *et al.*, conducted research on university students in 2016 which showed greater percentage of myofascial trigger points in both left and right upper trapezius. They also concluded that university students were more prone to develop trigger points in upper trapezius, neck extensor and levator scapulae [15]. The study Celik and Kaya indicated that although there is no significant difference between dominant and non-dominant side, muscle strength is lower significantly in subjects who have trigger points in comparison with healthy subjects [14]. Myofascial trigger points are related with a high symptom burden and a detrimental effect on both physical and psychosocial functioning [16]. Young population usually do not find nuisance about good neck postures and maintain static postures during performing activities specially while using electronic devices, so there exist higher chances of developing myofascial trigger points which may decrease their quality of life [17]. Thus, proper assessment and identification of myofascial trigger points in this population along with postural guidance and some exercises can eventually help in decreasing physical stress and improving quality of life [18]. So, the primary aim of current study was designed to explore the frequency of active and latent trigger points of trapezius in healthy individuals and secondary aim was to find out the its association with gender.

METHODS

A cross sectional survey from April 2018- August 2018 was conducted after the approval from ethical review committee of Riphah College of Rehabilitation Sciences. Participants were selected by non-probability convenient sampling technique with a sample size of 323 calculated through Rao-software calculator while assuming student population of 2000 at 95% confidence interval and 5% error of margin. Data were collected from both graduate and undergraduate students from the department of Riphah college of Rehabilitation and allied health sciences. Both genders, with the age of 18 to 35 years were included in the study. Individuals having inflammatory arthritis, cervical spondylolisthesis, and spinal stenosis were excluded from the study. All subjects signed mandatory consent form to ensure their participation in the research project. The participants were assessed according to the assessment form which consists of demographic data of participants including their age, gender, and dominant hand. Active and passive trapezius stretch was performed on both sides, finding normal and painful. Active trapezius stretch was performed by the individuals which was explained to them by the researcher. Passive trapezius stretch was performed by the researcher. Five trapezius trigger points were then assessed on both the right and left side to find out the active, latent and absent points. All the five trapezius trigger points were then palpated by the researcher and noted down on the assessment form. Analysis was carried out on 303 participants as twenty participants refused to participate in the current study. Descriptive statistics were carried, for categorical variables frequency and percentage and for numerical variable Mean±SD was calculated. Chi square test was used to find the association. p value <0.05 considered significant. The data were analyzed using SPSS 24.0.

RESULTS

The mean age of total participants was 23.60±4.6 years. Out of 303, 60 (19.8%) were male and 243(80.2%) were females. The majority were right-handed 291(96.0%), while 12(4.0%) were left-handed. Among the participants, the normal active and passive stretch on right was 209(69%) and 189(62.4%) respectively. The ratio of normal to painful was 6:4 which is shown in Table 1.

Variables	Frequency (%)
Active trapezius right stretch	
Normal	209 (69%)
Painful	94 (31%)
Active trapezius left stretch	
Normal	198 (65.3%)
Painful	105 (34.7%)

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Passive trapezius right stretch	
Normal	189 (62.4%)
Painful	114 (37.6%)
Passive trapezius left stretch	
Normal	162 (53.5%)
Painful	141 (46.5%)

Table 1: Ratio of normal to painful stretch of Left and Right side

The trapezius trigger point 1 of right side (TT1Rt side) was found to be active in 85(28.1%) participants and the trapezius trigger point 1 of left side (TT1Lt side) was found active in 54 (17.8%) participants. The trapezius trigger point 2 of right side (TT2Rt side) was found active in 91(30%) participants, while the trapezius trigger point 2 of left side (TT2Lt side) was found active in 57(18.8%) participants. The trapezius trigger point 3 of right side (TT3Rt side) was found active in 51(16.8%) participants and the trapezius trigger point 3 of left side (TT3Lt side) was found active in 31(10.2%). The trapezius trigger point 4 of right side (TT4Rt side) was found active in 40(13.2%) participants while the trapezius trigger point 4 of left side (TT4Lt side) was found active in 21 (6.9%) participants. The trapezius trigger point 5 of right side (TT5Rt side) was found active in 39(12.9%) participants and the trapezius triggers point 5 of left side (TT5lt side) was found active in 10(3.3%) participants. The details of latent and absent trigger points of both right and left sides are mentioned in Table 2 & 3.

Variables	n (%)	TTI RT SIDE	TT2 RT SIDE	TT3 RT SIDE	TT4 RT SIDE	TT5 RT SIDE
Active	Frequency (%)	85 (28.1%)	91 (30%)	51 (16.8%)	40 (13.2%)	39 (12.9%)
Latent	Frequency (%)	57 (18.8%)	75 (24.8%)	53 (17.5%)	55 (18.2%)	43 (14.2%)
Absent	Frequency (%)	161 (53.1%)	137 (45.2%)	199 (65.7%)	208 (68.6%)	221 (72.9%)

Table 2: Frequency of active, latent and absent trigger points on Right side

Variable	n (%)	TTI RT SIDE	TT2 RT SIDE	TT3 RT SIDE	TT4 RT SIDE	TT5 RT SIDE
Active	Frequency (%)	54 (17.8%)	57 (18.8%)	31 (10.2%)	21 (6.9%)	10 (3.3%)
Latent	Frequency (%)	63 (20.8%)	86 (28.4%)	52 (17.2%)	41 (13.5%)	35 (11.6%)
Absent	Frequency (%)	186 (61.4%)	160 (52.8%)	220 (72.6%)	241 (79.5%)	258 (85.1%)

Table 3: Frequency of active, latent and absent trigger points on Left side

The association between gender and active trigger points using chi square test was not significant (p>0.245), while the association between gender and latent trigger points was found to be p>0.740 (Table 4 & 5).

Active trigger points										p-value
Gender	0	1	2	3	4	5	6	7	10	
Male f (%)	17(5.6%)	11(3.6%)	13(4.3%)	9(3.0%)	5(1.7%)	4(1.3%)	1(0.3%)	0(0.0%)	0(0.0%)	0.245
Female f (%)	84(25.4%)	47(12.9%)	58(19.1%)	28(9.2%)	20(6.6%)	2(0.7%)	2(0.7%)	1(0.3%)	1(0.3%)	

Table 4: Association between gender and Active trigger points

Latent trigger points										p-value
Gender	0	1	2	3	4	5	6	7	10	
Male f (%)	22(6.6%)	12(4.0%)	12(4.0%)	9(3.0%)	5(1.7%)	1(0.3%)	0(0.0%)	1(0.3%)	0(0.0%)	0.740
Female f (%)	77(25.4%)	33(12.9%)	47(15.5%)	31(10.2%)	23(7.6%)	15(5.0%)	8(2.6%)	2(0.7%)	1(0.3%)	

Table 5: Association between gender and latent trigger points

DISCUSSION

This study was conducted to find out the prevalence of myofascial trigger point in healthy individuals. MTrPs are local spots that have increased sensitivity to compression and result in characteristic referred sensations, discomfort, tenderness, muscle dysfunction and sympathetic hyperactivity. The myofascial trigger points are divided in to active and latent on both right and left side. This is supported by some previous studies of Bron *et al.*, and Grieve *et al.*, which were conducted to find out the frequency of active and latent myofascial trigger points in neck, shoulder pain and in non- specific neck and shoulder pain. In these studies, most prevalent muscle recognized of having MTrPs is the trapezius [9, 19]. This study showed that the frequency of overall trapezius trigger point is less in healthy individuals whereas the majority of the adults have at least one or two active and latent trigger points. This is supported by the study of Cimbiz *et al.*, on trigger point evaluation in university students where participants were divided in to two groups with myofascial pain syndrome (MPS) and without myofascial pain syndrome (MPS). They observed that general evaluation score, fatigue, and number of TrPs in control group were lower than MPS groups. Additionally, they found almost four TrPs in MPS group however one or no TrPs were found in control

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group. The highest prevalence of TrPs were observed on the trapezium muscle [20]. The majority of participants had more frequency of absent trigger points on both left and right sides. Lucas *et al.,* in their study on healthy participants to find out prevalence of latent trigger points LTrPs in scapular positioning muscles also concluded that out of one hundred and fifty-four healthy participants 89.8% had minimum one LTrPs in the scapular positioning muscles [21]. This study indicates that trapezius trigger points 1 and 2 are more active and latent on both sides which is in concurrent with the result of the study by Sacramento *et al.,* conducted to find out the presence of latent myofascial trigger points and determination of pressure pain thresholds on children and young adults in which the major number of latent myofascial trigger points were found in trapezius located on upper back affecting 13 adults on dominant side [22]. Another study conducted by Manoharlal *et al.,* in their work on university students showed greater percentage of myofascial trigger points were present in left and right upper trapezius [15]. In the current study there was no significant association found between gender and myofascial trigger points (active and latent) on left and right sides. A study done by Grieve *et al.,* also concluded that there was no noteworthy association of gender and latent myofascial trigger point occurrence in left or right upper trapezius [9].

CONCLUSIONS

It is concluded that the frequency of trapezius trigger point is less in healthy individuals whereas most of the young individuals have at least one or two active or latent trigger points. Moreover, active and latent trigger points have no association with gender.

Authors Contribution

Conceptualization: MK
Methodology: FB
Formal analysis: FB, SKK
Writing-review and editing: HA, FB, SKK. HR, AGS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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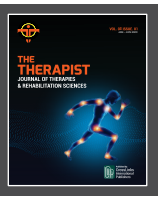

Original Article

Relationship of Resilience and Anxiety with Injury Prevention Programs in Pakistani Footballers

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ABSTRACT

Resilience is a one of the major psychological qualities that enhance an individual's strength and shield individuals from the adverse effects of diverse situations. **Objective:** To find out resilience and anxiety in footballers following or not following an injury prevention program. **Methods:** The study design used for this study was comparative cross-sectional survey, and data were collected from 35 football players. Players who were following or not following an injury prevention program were divided into two groups. Data for the resilience and anxiety was collected with help of strait trait anxiety questionnaire and Conner-Davidson resilience scale. **Results**: There was significant difference ($p \leq 0.05$) between the two groups for state anxiety in players not following any injury prevention program (44.15±4.71) and players following injury prevention program (39.00±3.77). Between groups comparison for trait anxiety also showed significant difference ($p \leq 0.05$) for players not following any injury prevention program (45.30±5.56) and following injury prevention program (40.20±4.21). Between groups comparison also showed that there was significant difference ($p<0.05$) in CDRS scores for players not following any injury prevention program (81.65±1.42) and players following injury prevention programs (92.20±1.97). **Conclusions**: The present study concluded that those players who had less anxiety levels had increased resilience levels while those players who were having increased anxiety had decreased resilience. There was a significant difference between anxiety and resilience levels and the players who were following injury prevention programs had less state and trait anxiety and better resilience.

INTRODUCTION

One of the most popular sports footballs is globally with a growing number of active players as well as viewers [1]. Football is by far the most globalized sport in the earth Football performance is grounded on factors such as to be fit physically, coordination, technique, endurance, tactics and agility. To be successful, players of football must also be able to leap, kick, tackle, and run [2]. Around 200,000 professional and 240 million amateur football athletes compete worldwide, with men accounting for roughly 80% of the total [3]. For many years, coaches, athletes, and scholars have been fascinated by the role of anxiety in sports. Anyone who has seen or participated in sports knows that emotional and motivational variables can cause one athlete to "peak" in the crucible of a race while another delays or "chokes" [4]. Anxiety is the body's natural response to threat. Generally, anxiety is unusual; nevertheless. Some life occurrences caution us that we are in a risky condition. Anxiety is a normal response in these settings since anxiety's function is to deploy the body's defenses [5]. Resilience is a person's ability to recover health after suffering a setback. Resilience is therefore defined as an individual's capacity to "bounce back" after

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experiencing stress. Athletes frequently suffer from injuries, mental health concerns, relationship stresses, and abuse, therefore how they adapt to it, or how resilient they are, is of paramount significance [6]. Athletes are frequently concerned about sports injuries. Many studies have been conducted to determine the predictors and risk factors for sports injuries. Currently, researchers are mostly interested in establishing the significance of certain psychosocial factors in calculating sensitivity or resistance to damage [7]. A study draw a conclusion that there is nearly a straight and noteworthy association among the amount of sports anxiety (physical, cognitive, and mental) and the overall number of the sports injuries that occur to players in contests, in addition to the previous year. Athletes with acute anxiety are more expected to be hurt, and the ratio of dissimilar injuries is greater [5]. players who had anxiety symptoms during the preseason were more exposed to get injuries in the upcoming year. Athletes' psychological health and injury prevention might be the subject of targeted programs. [8]. Injury is defined as any physical illness induced by a player that took more than two weeks or bring about in missing a following match or training session. The severity of injury was categorized into 3 groups grounded on the interval of complaints and time off from matches and exercise periods. A harm was ordered as slight if there was no nonappearance for up to 1 week or no complaints for more than 2 weeks; modest if there was nonappearance for further than one week but a smaller amount than 4 weeks; and severe if there was no lack for more than four weeks or severe injury, such as a breakage and disarticulation. Overuse harm was described as one induced by recurring micro trauma with no recognizable traumatic event [9]. Musculoskeletal injuries are one the foremost problem facing in football participant. In which approximately 20% to 37% injuries were reported in male professional level, while if we look at the amateur level is around 18% to 23%. The player are mostly facing delayed onset muscles soreness, muscular strain, compression injuries, sprain, fracture, meniscal and ligament tear are more frequent in both male and female football athletes [10]. The highest incidences of injuries of player in the professional league of the United States of America, while the bottommost incidence injuries were found in Dutch and Danish among low level players. By comparison the match injuries are 4-6 times greater than injuries occurs during training session. One or two studies also explored that during football events the level of injuries is higher in male than female players. Whereas if we see on the other side few types of injuries i.e., anterior cruciate ligament (ACL) injuries were seen more regular in men than woman athletes. This study also reported that age is also a key factor in injuries for example the 17-18 years old age group seems to have equal or even greater than injuries of the adult players [11]. The CD-RISC is a small, personal-reported quantity of resilience with decent psychographic qualities. The results of this study, by means of CD-RISC, illustrate that resilience is anticipated and affect by health status (i.e., people with mental illness have lower levels of resilience than the over-all residents); resilience is changeable and can increase with cure; and more enhancement in resilience matches to advanced altitudes of worldwide development. The CD-RISC has the possible to be valuable in both clinical treatment and research [12]. Higher resilience was linked to lower anxiety levels and decreased depression in Bhutanese individuals, with their personal competence and resilience playing a major role for most of the effects. The results of this study point to potential areas for psychological health intervention in order to improve player resilience [13]. The objective of the this study was to find out resilience and anxiety in footballers following or not following an injury prevention program, to determine the relationship between resilience and anxiety in footballers following or not following an injury prevention program and to compare resilience and anxiety in footballers following or not following an injury prevention program.

METHODS

The type of study design used for this study was comparative cross-sectional study. Non-probability convenience sampling technique was adopted for this study. The present study was carried out at Pakistan Sports Board (PSB), Islamabad. G-Power 3.1 was used to calculate the sample size with 80% power and 95% confidence interval on the basis of an A-priori calculation [14]. Inclusion Criteria for the participants were aged between16-35 years, both male and female players, Football players participating in games for the past one month, and for 3 days more than 3 days a week. Players with any musculoskeletal injury or disorder/deformity were excluded from the study. Participants that fulfilled both inclusion and exclusion criteria were recruited for the study. After giving their informed consent, athletes were screened as per inclusion criteria. After assessment and screening, by randomization, the individuals were categorized into two groups. Group A consisted of those who did not follow an injury prevention program. And in group B those participants were involved who followed an injury prevention program. The data for anxiety and resilience was collected using state-trait anxiety questionnaire and Conner-Davidson's Resilience Scale respectively. Data Collection Tools for the study were Connor-Davidson Resilience scale State-Trait Anxiety Inventory. One of the study tools was Connor-Davidson

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Resilience scale (CD-RISC), that is grounded on Connor and Davidson's sketch of players' resilience as a multi-component characteristic score that varies with respect to different contexts, different timelines, various ages, gender groups, and among various cultural background, as well as an individual's changed life conditions. The CD-RISC has 25 self-calculated questions that describe hardiness, action orientation, self-efficacy, assurance, flexibility, patience, and resilience in the face of adversity, and other elements that embody the perception of resilience [15]. The State-Trait Anxiety Inventory (STAI) is being formulated and established to offer trustworthy, comparatively short, self-report gauge for measuring the level of state and trait anxiety in investigation and clinical rehearsal. The STAI have two 20-element scales for calculating the amount of anxiety as an emotional state (S-Anxiety) and individual dissimilarities in anxiety proneness as a personality trait (T-Anxiety). In responding to the S-Anxiety points, subjects state the strength of their emotional state of anxiety "right now, at this moment" by scoring once selves on the following 4-point scale: (1) Not at all, (2) Somewhat, (3) Moderately so, (4) Very much so. Answers to the T-Anxiety items require subjects to point out how they usually feel by answering how regularly they have experienced anxiety-related feelings and perceptions on a 4-point scale: (1) Almost never, (2) Sometimes, (3) Often, and (4) Almost always (9). Data were entered and analyzed by using SPSS 22.0. all the quantitative variables were presented by Mean + SD and qualitative with Frequency and percentages. Both groups were compared for Mean comparison of players following and not following injury prevention programs by using independent sample t test and Pearson correlation coefficients were also applied to see the relationship of variables. P-value <0.05 was considered s significant. A graphical description of study is given in figure 1.

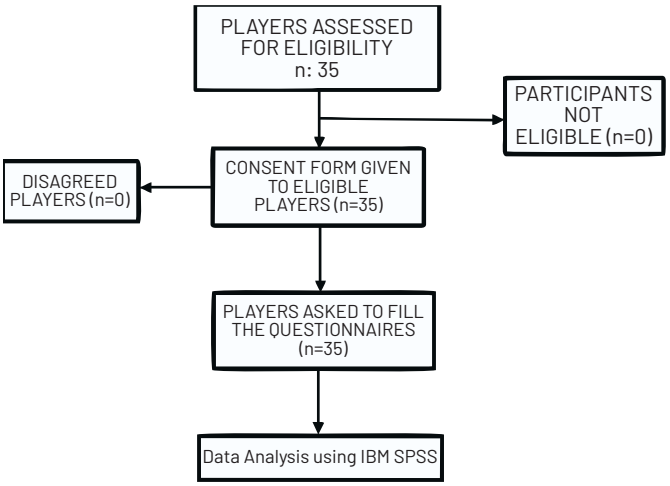

Figure 1: Study Flowchart Diagram

RESULTS

The main purpose of our study was to find and compare the resilience and anxiety in footballers following or not following an injury prevention program. There were a total number of 35 athletes who participated in the study, out of which 14.3% (n=5) were females and 85.7% (n=30) were males. The mean age of individuals was 24±4.37 with minimum of 18 years and maximum of 32 years old. There was significant difference (p=0.001) between both groups state anxiety with players not following any injury prevention program (44.15±4.71) and players following injury prevention program (39.00±3.77). Between groups comparison for trait anxiety also showed significant difference (p=0.006), for players not following any injury prevention program (45.30±5.56) and players following injury prevention programs (40.20±4.21). Between groups comparison showed that there was significant improvement (p=0.001) in CDRS with players not following any injury prevention program (81.65± 1.42) and players following injury prevention programs (92.20±1.97). This has been presented in (Table 1).

Variables	Not following any injury prevention program	Following injury prevention programs	p-value
	Mean ± SD	Mean ± SD	
State	44.15±4.71	39.00±3.77	0.001
Trait	45.30±5.56	40.20±4.21	0.006
CDRS	81.65±1.42	92.20±1.97	0.001

Table 1: Mean comparison of players following and not following injury prevention programs

Pearson correlation showed negative correlation between state anxiety and resilience in football players. There was a moderate negative correlation with value of *r*=-0. 480.The result showed negative correlation between trait anxiety and resilience in football players. This indicates the strong negative correlation which was -0.379. This proves that those football players who had less anxiety levels were having greater resilience level and those having high resilience were having decreased anxiety level. Correlation of Conner Davidson resilience scale with both state and trait was analyzed, results of which showed that both state (r=-0.480) and trait (r=-0.379) have strong negative correlation with Conner Davidson resilience scale. (Table 2, 3).

	CD-Resilience Scale	State Anxiety
CD-Resilience Scale	-	
State Anxiety	-0.480**	-

Table 2: Pearson correlation of CDRS and State Anxiety
**Correlation is significant (p=0.004) at the 0.01 level (2-tailed)

	CD-Resilience Scale	State Anxiety
CD-Resilience Scale	-	
Trait Anxiety-0.379**	-0.379**	-

Table 3: Pearson correlation of CDRS and Trait Anxiety
**Correlation is significant (p=0.025) at the 0.01 level (2-tailed)

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DISCUSSION

Football is a game which has always had a big audience and so comes along the possibility of stress, depression, and anxiety among the professional players as a question of what if they don't rise up to the expectation of the crowd. Since, it's being treated like a profession, there is always the chance of being demoted or removed or replaced due to any reason including injury. There have been extensive number of studies on stress preseason, during season, as well as the resilience of players. Resilience is the quality of players to perform under stress and being able to carry on with other activities like normal. The data set varies hugely between men and women belonging to professional sports like football and those that are retired from professional sports along with those who never played any sport [16]. For the analysis different types of tests and questionnaires have been used like Connor Davidson's, t-test [9]. conducted a study on the German female footballers belonging to first division second division. They analyzed the depression and anxiety in 17 teams using Center of Epidemiologic Studies Depression Scale (CES-D) and the Generalized Anxiety Disorder (GAD-7) scale. They concluded that the prevalence of depression and generalized anxiety symptoms in elite football players is affected by personal and sport-specific variables. It is very important to spread awareness of the mental health issues an athlete, a team coach might be facing and to encourage the treatment of those problems. Most essentially to destigmatize the mental health problems like stress and anxiety as well as any physical injuries as the saying goes "prevention is better than cure" [9]. An important factor is the high stress amongst athletes about any injuries during the game [17]. The tests conducted on a normally distributed sample for the analysis of groups that followed injury prevention program and those that did not follow injury prevention program. The results were a hopeful indication of injury prevention program. Keeping in mind all of this we also conducted a few tests and comparisons using the Connor Davidson resilience scale and State trait anxiety inventory. We can observe from the estimates in the results of the parameters of the study that may leading to the injuries in footballers. The difference of the indicators relating to both psychological variables (Resilience and Anxiety) are significantly different in both groups ($p< 0.001$). Providing health care to professional players whether mentally for their depression and anxiety or physically for their knees or any therapeutic conditions is essential to ensure a healthy life of a football professional. It is crucial to make it a normal aspect of life of a professional footballer to take care of their mental and physical health. Poudel *et al.*, conducted a study which showed the group of proportion of participants having above threshold anxiety i.e., 34.2%, resilience was found to be inversely associated with all values of anxiety. Participants who had the highest and better resilience scores had a comparatively significant decreased risk of developing anxiety. This was in favor of our results as higher resilience scores were found to be correlated with reduced anxiety [13]. In a study conducted by Zurita-Ortega *et al.*, results showed that resilience was directly correlated with the values obtained from the anxiety questionnaire. This suggests that those football players experience a state of anxiety and concern as a direct result of sustaining an injury due to not following an injury prevention program. This is supported by few other previous research studies. It was observed that the capacity of resilience and anxiety in sport were positively related showing higher correlations in non-injured athletes. It is possible that the capacity for resilience of non-injured athletes is higher because they had followed an injury prevention program. It has not been diminished by the frustration experienced by injured athletes generated when they are not able to compete [18]. According to a study exercise-based prevention programs are useful in the reduction of musculoskeletal injuries among football players which can ultimately reduce the level of anxiety and frustration due to which a player can bounce back confidently to the field [19]. This study results also showed that football players who were following the injury prevention program had low injury related anxiety. The previous study's results demonstrated that following an injury prevention program which is usually performed as a warm-up routine can significantly reduce vertical ground-reaction forces on the player as compared with a standard warm-up routine; however, a maintenance program is often required in order to retain the effects of these programs [20]. As many previous literatures concluded that an exercise program does not significantly affect the performance of players or physical activity does not improve. But there was a huge difference in their mental ability to cope with hard situations leading to anxiety. Also, it was noted that bouncing back to play was good in those players who were following an injury prevention program. A study was conducted in which an exercise program was designed to prevent physical injury but there was no difference seen between the groups who were following exercise program and those who were not following the exercise program [21].

CONCLUSIONS

The present study concluded that those players who had less anxiety levels had increased resilience levels while those players who were having increased anxiety had decreased resilience. There was a significant difference between anxiety and resilience levels and the players who were following injury prevention programs had less state

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and trait anxiety and better resilience.

Authors Contribution

Conceptualization: EK
Methodology: NS, AF
Formal analysis: EK, AF
Writing-review and editing: EK, NS, AF, ND, RM, SI, MK

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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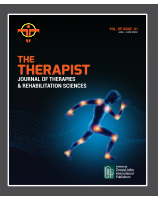

Original Article

Efficacy of Compassion Focused Therapy for Managing Skin Shaming of Acne in Young Women

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ABSTRACT

People are socially evaluated from face as ugly/beautiful. So person with acne isolate themselves from social gathering because of fear of stigmatized as unattractive. This social rejection leads them towards skin shaming of acne. Previous studies were not giving much importance to psychological impact of acne; just dermatological treatment was focus of attention. **Objectives:** To find a short duration but effective therapy to manage skin shaming of acne in young women. To test the efficacy of Compassion Focused Therapy on managing skin shaming of acne in young women. **Methods:** The research was an experimental study with sample of 64 young women of 18-25 years. 32 young women are allocated to therapy group and 32 women are allocated to control group. Data were collected at three time intervals of pre-therapy, post-therapy and follow-up. SPSS 21.0 version was used for data analysis. **Results:** Results clearly indicated significant reduction of skin shaming due to acne of young women from pre-therapy to post-therapy and also from pre-therapy to follow up. When therapy group women data compared with control group women data, conforms our objectives of study that that compassion focused therapy is effective and efficient therapy to manage skin shaming of acne in young women. **Conclusion:** Compassion Focused Therapy is successful therapy to manage skin shaming of acne in young women.

INTRODUCTION

Human first impression is formed mostly on the base of physical appearance. When talking about physical appearance, special attention is given on the beauty of our face. So we can say that in the formation of first impression, most prominent part is our face. In social gathering, people are judged on the base of some ideal standards about beauty. Clear face is symbol of beauty for females to meet the beauty ideals. Due to these standards, women with acne begin to consider themselves ugly [1]. Hence women with acne considered themselves misfit in society and lead themselves towards frustration, self-criticism and skin shaming due to acne. The feelings of self- criticism, imperfection, negativity and embarrassment about one's own skin due to acne conditions is called skin shaming due to acne. Skin shaming triggers other psychological issues of low self- confidence, frustration and guilt of not meeting beauty norms. Most often acne is considered as dermatological problem but surprisingly it is the leading cause of depression regarding quality of life with acne, anxiety to attend social gathering with acne, self-criticism regarding skin appearance and shame of not having crystal clear face [2]. For facial beauty and attractiveness women

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of young age show much concern than young male [3]. These beauty concerns leads women towards skin shaming of acne more rapidly as compared male. In past studies researchers were keenly interested to treat physical conditions of skin issues and acne. Not enough research work is present to manage psychological distress of acne conditions. So it is the need of time, to develop a healthy solution for young women to help them to get rid from skin shaming due to acne. A lot of therapies are used to treat the skin shaming due to acne. Many of them are effective but not all. In present study our focus is to develop the inner feelings of kindness, love, care and compassion to manage the skin shaming of acne. These inner feelings are craved through Self-Compassion Focused Therapy. Self-compassion is a way to being mindful, caring and loving for yourself. It help to get rid from the destructive feelings of worthlessness [4]. Self-compassion have three components [5]. Self-kindness is the first component of self-compassion which leads a person to being non-critical and non-judgmental in difficult phase of life [4]. As people having acne judge their skin dull and ugly but self-kindness teach them to accept the flaws of skin. In pain and sufferings, the second component of self-compassion which is common humanity teach us that difficulties are part of normal life. As a people question that why skin having flaws. Common humanity teach them not to be worry because everyone having imperfections and flaws. Third element of self-compassion is mindfulness which enable us to un-biased acceptance of reality. It teaches us to face reality instead of ignoring the failures and painful events. A person with acne avoid the social gathering because of fear of stigmatizing as ugly person. But mindfulness teaches us to be manfully accept the painful reality instead of avoiding or ignoring. Compassion work as a buffer for self against shame, anxiety, and guilt it is negatively correlated with guilt and intense emotions of shame [6]. A cross-sectional study give us insight that compassionate and kindness for self is a buffer against the negativity of harmful emotions. Self-compassion is a mental health tool to speed up personal well-being [7]. To cope up distress and negativity development of compassion for self is necessary. A study yielded results that positive self-perception and being mindful are the tool to foster self-compassion [8]. Hence to cultivate mental wellbeing to manage negativity, self-compassion based novice therapy is used [9, 10]. Because self-compassionate is a tool to foster kindness, gentleness and non-critic self-view in phase of pain and difficulty [11]. "There is no single dermatological issue that causes the huge sum of psychological trauma and sufferings and to destroy self-confidence then does by the acne. Mental wellbeing is miserable for person with acne because they are highly sensitive towards their facial beauty and appearance" [12]. Because of appearance concerns, women face shaming of acne in their daily life [12]. So our study mainly focus on shame related to acne among young female and help them become compassionate towards their self through Compassion Focused Therapy. There is no enough literature is present about the treat acne effects on mental issues [13]. The previous literature revealed that, in past there was not too much attention given to skin related pain and distress of women so our main aim of study is to give attention to this issue to fill the research gap. In past the research regarding the skin-shaming due to acne are conducted in western world, so main purpose of the research is to conduct in eastern world and help the eastern females to manage the skin-shaming due to acne with the help of Self-Compassionate focused therapy. Objectives of the study were: To analyze the efficacy of compassion focused therapy in management of acne among young females. To analyze the efficacy of compassion focused therapy in management of acne among young females as compared to control group females. Hypotheses of the study were: Compassionate focused therapy significantly reduce skin shaming due to acne through compassion focused therapy. Compassionate focused therapy significantly reduce skin shaming due to acne in young women as compared to control group young women.

METHODS

It was the experimental research, to test efficacy of Compassion Focused Therapy in management of Skin Shaming of Acne. The population included all the young females of Bahawalpur having skin shaming due to acne of age range 18-25. Random convenient **s**ampling had use to collect data of young females (N= 64) with acne shaming. 50% females were included in therapy group and 50% females were included in control group. Sample was collected from private skin clinics, hospitals and universities. An informed consent form was filled by the participants to assure them that their data must be kept confidential. Self-compassion is to being mindfully accept the pain of self, experiencing care and love toward self, a practice of become nonjudgmental and having uncritical attitude for life's failures, and recognizing that one's self experience of pain and failure is part of the common human experience [14]. Negative feelings of disgust, guilt, frustration, imperfection and embarrassment about one's own skin due to acne and negative judgment of one's own skin as ugly and feel shame for having this unattractive appearance of the skin is skin shaming [15-18]. Short form of Neff's Self-Compassion Scale was used as screening tool to check the level of self-compassion in acne patients.

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SCS consists of 12 items also having six subscales. Self-Kindness Items: 2, 6, Self-Judgment Items: 11, 12, Common Humanity Items: 5, 10, Isolation Items: 4, 8 Mindfulness Items: 3, 7 and Over-identification Items: 1, 9. A five point scale of almost never (1) to almost always (5) was used. Item number 11 and 12 of sub scale self-judgment, item number 4 and 8 of sub scale isolation and item number 1 and 9 of sub scale over-identification are reverse scored [9]. The SCS-SF was validated in English sample (n=415). The six-factor structure and a single higher-order factor was replicated. The SCS-SF demonstrated adequate internal consistency (Cronbach's alpha ≥ .86) and a near-perfect correlation with the long form SCS ($r \geq .97$ all samples). The SCS-SF is a reliable alternative to the long form SCS, especially when looking at overall self-compassion scores. The acne shame scale was modelled on McKinley and Hyde's (1996) body shame scale. It is 8 item based, 7-point Likert scale and the responses ranged from the strongly agree to strongly disagree. The scale demonstrated good reliability (α=0.92). The reliability of scales in various samples as (α=0.70) in females of middle-age and also founded (α=0.84) reliability in undergraduate females [19]. The African-Caribbean women sample yielded the reliability of (α=0.81) [20]. The acne shame scale assesses the degree people feel bad about not meeting internalized cultural expectations of acne-free skin. The response of participant low on an item are reverse scored. If an item is not answered by the participants, it was considered as missing. The data of a participant were counted as missing who did not answer item number four of the scale. Total average scores were calculated by summing responses for each item and dividing this by the number of non-missing items. Self-compassion and skin-shaming questionnaires were used to screening the participants. After screening 64 young females of age range 18-25 were selected. After singing the informed consent forms, 32 women were randomly allotted to therapy and 32 into control group and all were kept blind about the conditions allocated. Therapy group females were provided compassionate focused therapy, which was consist of 3 training sessions (each of 15 minutes) in a week. Females in control group were generally discussed about acne, therapy was not given. After completion of 2 weeks of training, follow up of one month was spent, then questionnaire was filled by both groups, to test the efficacy of compassionate focused therapy in managing skin shaming. Data were quantitatively analyzed by using the SPSS version 21.0. We used the repeated measure analysis of variance (RM-ANCOVA) because in study we had data of two almost same groups of young women (therapy group, control group), we also had data of three different time points (pre-therapy, post-therapy, follow-up) to test the efficacy of therapy. Hence to analyze effect of time and treatment on both therapy and control group we use the RM-ANCOVA. Results of analysis were presented in tabular and graphic forms.

RESULTS

The Table 1 consist of descriptive statistics. Comparison of mean and standard deviation of post therapy (M=22.56, SD= 2.16) and follow-up (M=23.37, SD= 3.01) scores show reduction than pre therapy (M= 38.31, SD= 3.30) scores of skin shaming of therapy group women. The standard deviation and mean score of control group show minor reduction in skin shaming at three levels.

Table 1: Descriptive Statistics (N=64)

Skin Shaming due to Acne Scores				
Pre therapy		Post Therapy	Follow up	
Treatment	Mean ± SD	Mean ± SD	Mean ± SD	N
Compassionate Focused Therapy group	38.31±3.30	22.56±2.16	23.37±3.01	32
Control group	39.96±2.13	37.93±2.61	38.62±2.31	32

The Table 2 gives the between subjects interaction effects of skin shaming due to acne scores of therapy group with treatment group as computed by the repeated measure analysis of variance (RM-ANCOVA). There was statistically significant interaction effect of therapy training with skin shaming of acne of therapy group.

$F(1, 61) = 494.21$, $p < .001$, partial $\eta^2 = .89$.

Whereas there was not statistically significant interaction effect of general discussion with skin shaming of acne of control group.

$F(1, 61) = .33$, $p > .005$, partial $\eta^2 = .005$.

Table 2: Between Subjects Effects (N=64)

Source	df (Error df)	F	P	Partial Eta2
Skin shaming due to acne score of therapy group* Therapy Training	1(61)	494.21	.000	.89
Skin shaming due to acne score of control group* General Discussion	1(61)	.33	.56	.005

The Table 3 describes the pairwise comparison of skin shaming for three time points as computed by repeated measure analysis of variance (RM-ANCOVA). There is significant reduction in skin shaming due to acne at post therapy $p < 0.001$ and at follow-up $p < 0.001$ when compared with pre therapy.

Table 3: Within Subjects Pairwise Comparisons (N=64)

Skin Shaming due to Acne Score						
(I) factor1	(J) factor1	Mean Difference (I-J)	SE	P	95% Confidence Interval	
					LL	UL
1	2	8.89	.39	.000	8.11	9.67
2	3	8.14	.41	.000	7.30	8.97
3	1	-8.89	.39	.000	-9.67	-8.11
	3	-.75	.36	.04	-1.48	-.01
	1	-8.14	.41	.000	-8.97	-7.30
	2	.75	.36	.04	.01	1.48

Figure 1 indicated the effect of time and treatment. It clearly indicated that through the Compassionate Focused therapy shows young women of therapy group show continuous improvement in Skin shaming due to acne from post-therapy to follow up. Whereas control group having no

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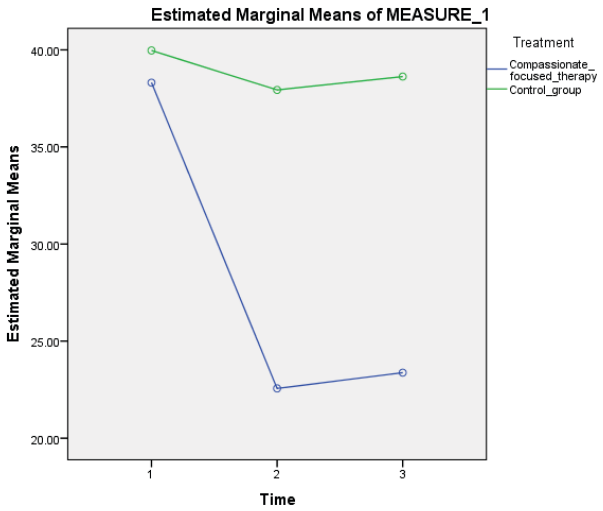

Figure 1: Graphical representation of effect of time and treatment on control group and experimental group

DISCUSSION

Mostly women are more concerned about facial appearance as compared to man. Emotional health is closely related to physical appearance. So when face is affected by acne, emotional health is also badly affected. Skin shaming due acne is the result of adverse emotional health. Our social life is also affected as the result of skin shaming of acne. Women negatively judge their face as ugly due to acne and avoid social gatherings. They are fearful that they are judge negatively because of face full of acne. So the current study give insight in about the solution to manage the acne shaming. Current research findings give us insight that Compassion Focused Therapy effectively manage the skin shaming due to acne in young women. Our first of objective of study was that compassion focused therapy is effective to manage skin shaming of acne in young female is accepted by the comparison of mean values of table one, we noticed significant reduction in skin shaming values of therapy group from pre-therapy (*M*= 38.31, *SD*= 3.30) to post-therapy (*M*=22.56, *SD*= 2.16) and from pre- therapy to follow up (*M*=23.37, *SD*= 3.01). When notice the mean values of control group from pre-therapy (*M*= 39.96, *SD*= 2.13) to post-therapy (*M*=37.93, *SD*= 2.61) and from pre- therapy to follow up (*M*=38.62, *SD*= 2.31) showed no significant reduction of skin shaming scores, so we can say that our second objective of study is accepted that compassion focused therapy is effective to manage skin shaming of acne of young females of therapy group as compared to control group females. So we can say that our study findings are consistent with previous researches as to reduce psychological effects like, guilt, anger and shame Compassion Focused Therapy is effective [20]. Moreover Compassionate focused meditation treatment is effective to reduce the anxiety and self-blame [21]. From repeated measure analysis of variance (RM-ANCOVA) results of table two, when compare the effect of therapy on therapy group with effect of general discussion with control group women, we found that Compassion Focused Therapy successfully lessen the skin shaming due to acne ($F(1, 61) = 494.21$, $p < .001$, partial $\eta^2 = .89$). While general discussion with control group women are not enough to manage the skin shaming due to acne ($F(1, 61) = .33$, $p > .005$, partial $\eta^2 = .005$). So alpha values of therapy group when compared with control group confirmed our second objective, to effectively manage the skin shaming of acne Compassion Focused Therapy is one of the most effective therapy as compared to general discussion about acne with control group women. Our findings are confirmed by the previous study by Kirby *et al.*, that Compassion Focused Therapy is successful therapy to manage negativity and self-blame. Moreover it is a best tool to foster the positivity and secure mental health [22]. Hence Compassion Focused Therapy develop kindness, self-understandings in phase of personal sufferings and pains [22, 23]. Pairwise comparison of self-compassionate based therapy to manage skin shaming of acne at three different levels of treatment in table three shows that there is significant reduction in skin shaming at post-therapy ($p < 0.001$) and follow-up ($p < 0.001$) when compared with pre-therapy which also confirms our first objective of study. Figure 1 mean values shows the effect of time (pre-therapy, post-therapy and follow-up) with treatment (compassion focused therapy for therapy group women) (general acne discussion sessions for control group women) (general discussion for control group women). When compare the effect of time and treatment therapy group mean values show improvement as compared to control group women, which clearly supported our second objective of research. That compassion focused therapy reduce skin shaming of therapy group women as compared to control group women. Previous study by Irons *et al.*, also yielded same results that Compassion Focused Therapy is an easy training to foster self-kindness, sense of strength and courage in painful time instead of self-blaming, shame and criticism [24]. It is a low cost therapy equally effective for all people having acne shaming to reduce self-criticism, frustration, guilt and shame [25]. Hence the current study findings are the healthy addition in literature. Findings of present research are a solution for young women to get rid negativity of skin shaming due to acne by Compassion Focused Therapy.

CONCLUSIONS

We concluded that Compassion Focused Therapy is one of the best choice for young women to successfully manage the skin shaming of acne. Compassion focused therapy develops Self-Compassion through training sessions,

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which help young women to non-judgmentally accept skin with flaws instead of shaming and self-criticism.

Authors Contribution

Conceptualization: AK, AB
Methodology: AK, AB
Formal analysis: AK, AB
Writing-review and editing: AK, AB,

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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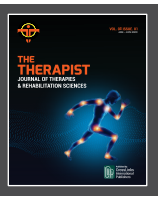

Original Article

Association of Low Back Pain with Body Mass Index and Stress among House Officers in Different Rotational Placements

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ABSTRACT

Low back pain (LBP) is the most common disorder affecting the back's muscles, nerves, and bones and affecting the quality of life. **Objective:** To find the association of LBP with body mass index and stress among house officers in different rotational placements. **Methods:** In this cross-sectional study, a sample of 170 participants were recruited. Oswestry disability index was used to assess the LBP and perceived stress scale was used to assess the stress. Inclusion Criteria includes house officers, both male and female and physical therapy internes. Exclusion Criteria includes disability, trauma and congenital disorder. Data were analyzed by IBM SPSS statistics version-25. **Results**: Out of 170 participants 10(5.9%) were underweight, 60(35.3%) were normal weight, 66(38.8%) were overweight and 34(20%) were obese. p value was .694 which showed that there is no association between LBP and body mass index. The p value for LBP and stress was .458 which showed there is no association. The p-value for LBP and different rotational placement was .000 which shows there is association present. **Conclusions:** There was no association found between LBP and body mass index, LBP and stress. There is association found between LBP and different rotational placements.

INTRODUCTION

LBP is the most occurring disorder involving the muscles, nerves, and bones of the back that effects the quality of life [1]. Pain in low back is the key cause of disability worldwide and weighty load on the working population [2]. Although itself back pain is not dangerous but it effects the quality of life [3]. There is also an association between the LBP and sedentary life style. Prolong sitting and standing increases the risk of LBP is also associated with high work load, poor posture and related to the manual exertion in handling the objects of person. Poor posture or high work load may fatigue the back muscles [4, 5]. LBP may be classified by duration as acute, sub-chronic, or chronic [6]. Hospital staff especially nurses and house officers are very prone to develop the LBP due to them prolong duty hours. Sometime their occupation may be harmful for their health and causes to produce the cumulative trauma disorder [7]. BMI and LBP have direct relation in each other [8]. BMI derivate from the height and weight to measure the body fat [9]. Obesity is one of the risk factors the provoke the pain in low back [10]. Through an increase in cortisol

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secretion, increased calorie intake, and a sedentary lifestyle, chronic psychosocial stress may contribute to obesity [11]. Stress is known to have a significant impact on health, affecting cortisol secretion, depression, diabetes, obesity, and disturbed sleep [12]. Psychological work factors have been taken into consideration, and risk factors include low mood, low control, high work demand, monotony at work, low job satisfaction, and poor relationships with coworkers [13]. Body weight was viewed as a potential frail gamble sign of LBP [14]. Extreme mileage through expanded mechanical demand and metabolic variables related to weight has been believed to be answerable for low back torment in the stout [15]. Since workers' health is a composite of their mental, physical, and social well-being, shift work's multifaceted impact on these aspects must be thoroughly addressed [16].

METHODS

After getting the institutional approval, a cross-sectional survey was conducted among house officers from Tertiary Care Hospitals of Faisalabad. Study was completed within 6 months after the approval of synopsis. 170 house officers were enrolled in this study. A convenient sampling technique was used. The sample was calculated as;

$n = Z_{\alpha/2}^{2}\, p(1-p)/\, d^{2}$

Sample size of 170 cases is calculated with 95% confidence interval, 9% margin of error and expected % of LBP as 47%. ODI and PSS questionnaire were used to get the data from house officers. ODI questionnaire used to evaluate the LBP and PSS questionnaire used to assess the stress. Both questionnaire contains 10 questions and both questionnaire have their own scoring. BMI was obtained by asking the weight and height of house officers. Inclusion Criteria includes house officers, both male and female and age 20-31. Exclusion Criteria includes disability, trauma and congenital disorders. Printed questionnaires were directly administrated to the house officers of different government and private hospitals. 19 house officers get from each rotational placement. 19 from medicine, 19 from surgery, 19 from emergency, 19 gynecology, 19 orthopedics, 19 pediatrics, 19 physiotherapies, 19 from psychiatrics and 18 from CCU. After completing the data, the data were analyzed through IBM SPSS statistics version 25.0. Calculated the descriptive statistics as mean ± standard deviation. chi square is used to analyze the association among different variables. Like by applying chi square test found the following results: there is no association found between LBP and BMI, LBP and stress. There was association found between LBP and different rotational placements. This study performed under the ethical considerations. The study had done on small size. This study was taken from the hospitals of Lahore only. There was no follow up in this study. There was the problem while collecting the data because majority of house officers were not cooperative.

RESULTS

Total 170 participants were asked to fill the questionnaire in this study. Part one of the questionnaire was about to demographic data age, gender, height, weight. The mean standard deviation of age was 23.75 ± 1.884. Minimum age of participants is 20 and the maximum age was 31. Out of 170 participants 41(23.1) were of 23 ages. Out of 170 participants 94(55.3%) were female and 76(44.7%) were male. Out of 170 participants 10(5.9%) were underweight, 60(35.3%) are normal weight, 66(38.8%) were overweight and 34(20%)were obese.

Table 1: Frequency and percentage of demographics, Pain and stress

Variables	F (%)
Gender	
Female	94 (55.3)
Male	76 (44.7)
BMI ranges	
Underweight=<18.5	10 (5.9)
Normal weight=18.5-24.9	60 (35.3)
Overweight=25-29.9	66 (38.8)
Obesity=BMI of 30 or greater	34 (20.0)
Underweight=<18.5	10 (5.9)
Pain intensity	
No pain	84 (49.4)
Mild pain	44 (25.9)
Moderate	31 (18.2)
Severe	9 (5.3)
Very severe	2 (1.2)

Table 2 showed the prevalence of lower back pain and stress in the participants. Out of 170 only 27 complaints about lower back pain.

Table 2: Prevalence of Low Back Pain and stress

Prevalence	N (%)
Low back Pain	
Yes	27 (15.9%)
No	143 (84.1%)
Total	170 (100%)
Stress	
Yes	34 (20%)
No	136 (79.3%)
Total	170 (100%)

Chi square was applied. p-value is .694 which was more than 0.5 which showed that there was no association between LBP and BMI (Table 3).

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Table 3: Association of LBP with BMI

LBP	Underweight =<18.5	Normal weight = 18.5–24.9	Overweight = 25–29.9	Obesity= BMI of 30 or greater	p-value
Minimal disability (0-20%)	9	50	53	26	0.694
Moderate disability (21-40%)	1	8	10	8	
Sever disability (41- 60%)	0	2	3	0	

Chi square test was applied. p-value was .458 that was more than 0.05 which showed there was no association present between the LBP and perceived stress (Table 4).

Table 4: Association of low back pain with perceived stress

LBP	Low stress (0- 13)	Moderate stress (14- 26)	High perceived stress (27-40)	p-value
Minimal disability (0-20%)	12	118	8	0.458
Moderate disability (21-40%)	0	26	1	
Sever disability (41- 60%)	0	5	0	

Chi square test was applied. p-value was .000 which was less than 0.05 that shows there was strong association present between the LBP and different rotational placements (Table 5). The house officers in medicine, orthopedics and physiotherapy ward have the greater chances to develop the minimal disability. Emergency house officers have greater chances to develop the moderate disability. CCU house officers has the greater chances to develop the sever disability.

Table 5: Association of low back pain with different rotational placements

LBP	Medicine	Surgery	Emergency	CCU	Gynae	PT	Paeds	Psychiatric	Ortho	p-value
Minimal disability(0-20%)	19	15	8	12	13	19	18	15	19	0.000
Moderate disability(21-40%)	0	4	11	3	5	0	1	3	0	
Severe disability (41- 60%)	0	0	0	3	1	0	0	1	0	

DISCUSSION

This study was to check the association of LBP with different rotational placements, BMI and stress among house officers. Many work related and physical factors are involved in the progression of pain. Large number of working hours, improper posture, poor techniques, handling a large number of patients and inadequate positions are main factors to cause the LBP. A cross sectional study to determine the LBP and NP in medical students' association with the quality of life. This study had population of 506. ODI, PSS and VA scales were used [11]. It has been observed that there is the lofty prevalence of decreased and mild LBP and NP among the medical students. More quality of life issues due to LBP increased by prolong standing. LBP and NP are poorly associated with the level of stress. The relationship between MSK pain and psychological stress has been excellently described in the health professionals. The Results of current study were consistent with this literature show a great association between LBP and different rotational placements. But cannot found association between LBP and BMI, LBP and stress [17]. Karahan *et al.*, conducted a cross sectional study to check the frequency of LBP, its associated features. 1600 participants were enrolled in study. 44-item questionnaire was used in the study. Population of the study was hospital staff. Many factors were associated with the occurrence of LBP like perceived stress, age, occupation, smoking and heavy lifting. Highest prevalence was in nurses which is 77.1%. It has been concluded that the risk of pain can be reduced by preventive measures like proper body mechanics and rest [18]. The current study results showed similarity with this literature as 29.4% participant showed pain in lifting weights. 59.4% showed that they feel upset and stressed out most of time. LBP can be related with prolonged sitting and standing. Physical therapists are at the higher risk to develop the MSK disorders like work related LBP [19]. The current research study showed that the physiotherapist had disability but less than CCU ward house officers. Alshami *et al.*, conducted a case control study to assess the association of psychological and physical factors with the LBP. PAQ, VAS and DAS scale were used between two groups. One group having LBP and other group's participant not having LBP but have same BMI and age. It has been observed that stress is present in the group which have the participants with LBP. Other psychological factors were observed that targeting the LBP [20]. However, the current research results were inconsistent with this literature as no association was found between stress and LBP among house officer. According to the study many work related activities among house officers produces LBP. Work related postures and positions, repetitive movements, prolong static posture, prolong standing, work burden may compensate pain produces the MSK disorders in the body.

CONCLUSIONS

This study conclude that work associated LBP was present in the house officers but the prevalence of LBP among

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house officers was low. House officers complains LBP during duty hours. Working in bad posture, prolong standing, prolong short sitting among house officers during work cause LBP. Many house officers documented that pain provokes during work was relieved by rest and medication. There is significant relation between LBP and different rotational placements(wards).

Authors Contribution

Conceptualization: TG
Methodology: SS, HA
Formal analysis: AI, MF
Writing-review and editing: SS, AK, MF, AR

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

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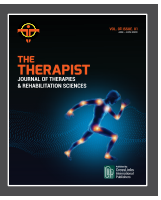

Original Article

Correlation of Burnout Syndrome with Musculoskeletal Disorders and Its Prevalence Among Medical Students

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ABSTRACT

Burnout is common exhaustion in students especially among medical students due to their increased study hours, increased demands according to the education sector and less tolerance. **Objective:** To determine the prevalence and correlation of burnout syndrome and musculoskeletal problems among university students in Lahore. **Methods:** The analytical cross-sectional study was conducted by including 181 medical students by using, a convenience sampling technique according to the predefined selection criteria. The Copenhagen Burnout Inventory (CBI) and Nordic Questionnaire were used for assessing the outcomes of the patient. The data were analyzed by using SPSS in which frequency, percentage, and Correlation analysis were used to determine the relationship that exists between burnout syndrome and musculoskeletal pain. **Results:** The study showed that Musculoskeletal pain and burnout syndrome exist a strong correlation among students of universities with a p-value <0.05. **Conclusions:** The study concluded that burnout syndrome had a statistically significant relationship with students' study years and musculoskeletal problems that ultimately affect their normal activities of daily life.

INTRODUCTION

Burnout is described as the "Occupational Phenomenon" with the triad of emotional exhaustion, depersonalization along with decreased personal achievement that develops psychological and physical symptoms [1, 2]. The medical profession is a very competitive field that develops Physical and work-related burnout among students and disturbs mental and emotional health, increasing the risk of burnout, depression, anxiety, emotional intolerance, and cynicism [3-5]. This is mostly due to their increased study hours, increased demands according to the education

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sector and less tolerance regarding their mistakes with less time for relaxation and self-care[6]. Medical students faced a lot of academic burnout and pressure described by Schaufeli that it is exhaustion and cynicism along with low professional efficacy and self-esteem. According to studies, it is most common among students of universities with a prevalence of 7 to 75.2%[7, 8]. Burnout affects their performance up to 21 to 43% and 14.9 to 57.7% was at risk of developing burnout syndrome [6]. Burnout is more prevalent among males as compared to women, especially among doctors and medical students with a 40% that increases emotional exhaustion, depersonalization, musculoskeletal pain, mental disease and suicidal rate[9], decreases their self-esteem, attitude and performance that leads to increase their dishonesty, misusage of drugs and smoking and suicide rate due to exam and failure pressure [2]. Musculoskeletal disorders are the most common side effect of burnout syndrome among medical students especially among fourth and final-year students having 33.4% having neck pain, 15.1% low back pain, 12.8% shoulder pain, 9.1% knee pain while burnout rate is more prevalent in second and third-year student with 67.% and 67.3% respectively[10, 11]. These are due to their sedentary lifestyle, less physical activities, extremer exposure to stressful routines and long hours of standing and sitting with and without back supports in classes and hospital wards, long duration of reading and awkward posture[10, 12]. Chen *et al.*, reported personal and work-related burnout increased the incidence of sharp injuries and musculoskeletal pain among medical professionals by 15.86% and had a mean of 41.22 in personal burnout and 39.33 in work-related burnout [13]. This yields either a positive effect by enhancing their self-confidence or a negative effect by developing extreme burnout. Such conditions lead to developing burnout and neck and upper body pain[14]. Ogunlana *et al.*, reported medical students are 89.7% prevalent to musculoskeletal disorders due to their prolonged sitting hours 71.1%, repetitive maneuvers 53.8% with neck and low back pain 66.2% and 64.4% respectively due to their burnout and tough routine[15]. The purpose of the study was to determine the prevalence and correlation between burnout syndrome and musculoskeletal problems among the medical students' University of Lahore. As due to higher pressure regarding their studies and performance in the field lead to developing syndrome and disorders which need to be enlightened in Pakistani Universities.

METHODS

An analytical cross-sectional study was conducted after the approval of the synopsis from the research ethical committee of the University of Lahore. The study had included 181 medical students from February 2022 to July 2022 by taking proper consent from participants. According to the inclusion, criteria of the study 181 students were enrolled in the study by using, a convenience sampling technique. The inclusion criteria of the study were 18-29 years of medical students both male and female were included who were studying at different Medical Universities (University of Lahore, Allama Iqbal Medical College, KEMU, Riphah University and Superior University). Participants were excluded from the study who were studied in some non-medical universities, and suffering from any recent injuries, muscular injuries, or accidents. In addition, facing any mental issues including depression, anxiety, and family issue. The data were collected through a predesigned questionnaire including Demographic data (age, gender, year of education, and medical department name and smoking history). the scales used for the analysis of burnout syndrome and Musculoskeletal disorders were Copenhagen Burnout Inventory (CBI) a most reliable and valid tool for assessing burnout level having Cronbach's alpha of 0.936 with 0.906 for assessing personal burnout and 0.765 for work-related burnout [16]. Nordic Questionnaire was used for assessing the musculoskeletal problems as having excellent reliability with Cronbach's alpha of 0.945 with construct validity of 100% with a sensitivity of 66 to 92%[17, 18]. The statistical analysis was done by the SPSS version 23.0. The frequency and percentage of the demographic data were found to determine the prevalence of Burnout Syndrome and Musculoskeletal disorders among medical students. The Correlation was applied to determine the relation between Burnout Syndrome and Musculoskeletal disorders.

RESULTS

Table 1 showed the descriptive statistics of the demographic data of the participants 77 (42.5%) participants of 18-24 age, 99(54.7%) were of 25-28 age and 5 (2.8%) were of above 28 years. However, among all the participants 102 (56.4%) were male and 79 (43.6%) were females. The result shows that among all the participants 38 (21%) were Physical therapists, 33 (18.2%) were MBBS doctors, 30 (16.6%) were UIPT, 29 (16%) were Pharma D, 27 (14.9%) were MLT, 15 (8.3%) were Biomedical engineers and 9 (5%) were biotechnology students. The result shows that among all the participants 37 (20.4%) were 1st year, 7(3.9%) were 2nd year, 39 (21.5%) were 3rd year, 26 (14.4%) were 4th year, 71(39.2%) were final year students and 1 (0.6 %) were professionals. The result shows that among all the participants 57 (31.5%) were having neck pain, 56(30.9%) were shoulder, 19 (10.5%) were wrist or hand pain, 31 (17.1%) were lower back and 18 (9.9%) were having hip or thighs pain.

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Table 1: Baseline Characteristics of Participants

Variables		Frequency (%)
Age	18-24	77 (42.5%)
	25-28	99 (54.7%)
	Above 28	5 (2.8%)
Gender	Male	102 (56.4%)
	Female	79 (43.6%)
Study Department	Physical Therapist	38 (21%)
	MBBS	33 (18.2%)
	UIPT	30 (16.6%)
	Pharma D	29 (16%)
	MLT	27 (14.9%)
	Biomedical Engineering	15 (8.3%)
	Biotechnology	9 (5%)
Study Year	1st year	37 (20.4%)
	2nd year	7 (3.9%)
	3rd year	39 (21.5%)
	4th year	26 (14.4%)
	Final year	71 (39.2%)
	Graduation year	1 (0.6%)
Pain in regions	Neck	57 (31.5%)
	Shoulder	56 (30.9%)
	Wrist/ Hand	19 (10.5%)
	Lower Back	31 (17.1%)
	Hip/ Thighs	18 (9.9%)

Table 2 described the frequency of burnout syndrome according to Personal, Work related and Client related burnout. The results showed that in the personal burnout category, 86 (74.5%) had Moderate, 71 (39.2%) had High and 24 (13.3%) had the severe intensity of burnout. Similarly, in the Work-related burnout category, 87 (48.1%) had Moderate, 63 (34.8%) had High and 31 (17.1%) had severe intensity of burnout. Additionally, in Client related burnout category, 85 (47%) had Moderate, 65 (35.9%) had High and 31 (17.1%) had severe intensity of burnout participants.

Table 2: Prevalence of Copenhagen Burnout Inventory (CBI)

Variables			Frequency (%)
CBI	Personal burnout	50-74 Moderate	86 (74.5%)
		75-99 High	71 (39.2%)
		100 Severe	24 (13.3%)
	Work-related burnout	50-74 Moderate	87 (48.1%)
		75-99 High	63 (34.8%)
		100 Severe	31 (17.1%)
	Client related burnout	50-74 Moderate	85 (47%)
		75-99 High	65 (35.9%)
		100 Severe	31 (17.1%)

Table 3 described the scoring of Musculoskeletal pain on the Nordic Questionnaire in the last 7 days and last 12 months. The results showed that in the last 7 days 21 (11.6%) had neck pain, 49 (27.1%) had shoulder pain, 52 (28.7%) had upper back pain, 49 (27.1%) had lower back pain, 6 (3.3%) had hip pain and 4 (2.2%) had knee pain. Similarly, the result of the last 12 months' analysis showed that among all participants, 15 (8.3%) had neck pain, 45 (24.9%) had shoulder pain,43 (23.8%) had upper back pain, 53 (29.3%) had lower back pain, 10 (5.5%) had hip pain and 15 (8.3%) had knee pain.

Table 3: Prevalence of Nordic Questionnaire scale

Variables	Frequency (%)					
	Neck	Shoulder	Upper Back	Lower Back	Hip	knee
Musculoskeletal pain in the last 7 Days	21 (11.6%)	49 (27.1%)	52 (28.7%)	49 (27.1%)	6 (3.3%)	4 (2.2%)
Musculoskeletal pain in the last 12 months	15 (8.3%)	45 (24.9%)	43 (23.8%)	53 (29.3%)	10 (5.5%)	15 (8.3%)

The correlation of burnout syndrome with the musculoskeletal disorder was described in Table 4. The results showed that during the last 7 days, students had neck pain of which 9 at moderate, 10 were high and 2 had severe levels. Similarly, 20 had moderate, 17 had high and 12 had severe pain in the shoulder. Furthermore, 26 had moderate pain, 17 had high and 9 had severe upper back pain. 22 had moderate, 18 had high and 9 had severe pain in the lower back pain while 2 had moderate, 3 had high and 1 had severe hip pain. Additionally, 1 had moderate and 3 had high knee pain with a Pearson value of 0.227 and p-value =0.05. The results confirmed that burnout among medical students had a statistically significant correlation with musculoskeletal disorders. Table 4 further described the relationship of burnout syndrome with musculoskeletal pain within the last 12 months that affect their daily activities of life. The results showed that within the last 12 months, students had neck pain of which 6 at moderate, 6 were high and 3 had severe levels. Similarly, 21 had moderate, 19 had high and 5 had severe pain in the shoulder while 16 had moderate pain, 20 were high and 7 had severe upper back pain. 24 had moderate, 18 had high and 11 had severe pain in lower back pain, while 3 had moderate, 2 had high and 10, had severe hip pain. Additionally, 10 had moderate, 3 had high and 2 had severe knee pain with a Pearson value of 0.106 and p-value =0.041. The results confirmed that burnout among medical students had a statistically significant correlation with musculoskeletal disorders that ultimately affect their normal activities of daily life. Table 4 further described the relationship between burnout syndrome with the study year of university students. The results showed that among 1st-year students, 19 had moderate, 13 were high and 5 had severe levels. Similarly, among 2nd-year students, 2 had moderate and 5 had a high level of burnout syndrome while among 3rd-year students, 18 had moderate, 13 were high and 8 had severe levels of burnout. Furthermore, among 4th-year students, 11 had moderate, 10 were high and 5 had severe levels and among Final year students, 30 had moderate, 27 were high and 14 had severe levels. Among Graduated students, only 1 had been reported with a severe level of burnout syndrome with a Pearson value of 0.288 and p-value =0.003. The results confirmed that burnout among medical students had a statistically significant correlation with study years that ultimately affect their

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normal activities of daily life.

Table 4: Correlation of Burnout Syndrome with Musculoskeletal Pain and Study Year

Nordic Scale		CBI			p-value
		Moderate	High	Severe	
Pain in Days	Neck pain	9	10	2	0.05
	Shoulder pain	20	17	12	
	Upper back pain	26	17	9	
	Lower back pain	22	18	9	
	Hip pain	2	3	1	
	Knee pain	1	3	0	
Pain in Months	Neck pain	6	6	3	0.041
	Shoulder pain	21	19	5	
	Upper back pain	16	20	7	
	Lower back pain	24	18	11	
	Hip pain	3	2	10	
	Knee pain	10	3	2	
Study year	1st year	19	13	5	0.003
	2nd year	2	5	0	
	3rd year	18	13	8	
	4th year	11	10	5	
	Final year	30	27	14	
	Graduation year	-	-	1	

DISCUSSION

This study was conducted to determine the prevalence and correlation of burnout syndrome and musculoskeletal problems among university students of Lahore. The results of the current study showed that medical students are highly prevalent in burnout syndrome and this led to the development of musculoskeletal pain in students from 1st year to the final year students as there is a significantly strong correlation exist between musculoskeletal pain and burnout syndrome p-value <0.05. Previous studies described that burnout syndrome leads to the development of emotional disturbance. The cross-sectional study conducted by Asghar *et al.*, concluded that Pakistani medical students had anger issues, having no time, no hobbies and prayer time that develops burnout syndrome mostly among the private university[6]. Burnout syndrome is highly prevalent in the development of many musculoskeletal disorders especially muscular pain in different segments of the body including neck, shoulder, upper, and lower back pain with a higher correlation among burnout with p-value <0.005. Aljadani *et al.*, also reported that Musculoskeletal disorders are 64.8% common among medical students, especially those suffering from burnout [19]. The basic reason for the development of burnout syndrome was the sedentary lifestyle and education pressure. Azzi *et al.*, described that change in the education system leads to the produce severe burnout issues at mental and health level and negatively affect the physical status of students with lower QoL scoring [20]. Valero-Chilleron *et al.*, described that medical students had an academic and tough routine that cause negative effects on the health of the nurses that lead to the development of burnout syndrome mostly among the students in the fourth or final year as depersonalization increased with the academic year [21]. Similarly, a study conducted by Gil-Calderon *et al.*, concluded that Burnout syndrome has a higher scoring among students in the fourth and final year while family support helps to reduce burnout among medical students[22]. This study supported current study results as higher scoring in the fourth and final year but the current study did not focus on the supporting effect of the family and the way family help in reducing burnout among students. This can be concurrent with the current study result as this can help lower burnout. Similarly Chan *et al.*, reported that most medical students especially physiotherapists and nursing students had more prevalence of neck pain at 26.5% and 26.1% and they have more recurrence of anxiety and low back pain due to their tough routine[23].

CONCLUSIONS

Burnout syndrome is most prevalent among medical students due to their hectic routine, tough study and ward rotation schedule study and peer pressure that increase the rate of development of musculoskeletal problems. Furthermore, there is a strong significant correlation between Burnout syndrome with students' study year and musculoskeletal problems.

Authors Contribution

Conceptualization: MT
Methodology: HZA, RM
Formal analysis: SS
Writing-review and editing: AR, AK, TG, QR

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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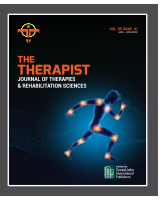

Original Article

Frequency of Work-Related Neck Pain in Freelancers

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ABSTRACT

The use of electronic devices like tablets, smartphones, desktop and laptop users has been increased to a lot of extent from past few years. So, the workers are more prone to be affected by neck pain, shoulder pain and other forms of musculoskeletal problems, due to lack of awareness about bad posture and ergonomics about workstation in their environment. **Objectives:** To find out the frequency of work-related neck pain in freelancers. **Methods:** It was a cross-sectional study containing of questionnaire based online survey in which the data were collected by asking the participants to fill the form online. There were 100 participants who were actively working in this field from last 6 months and all of them were having neck related problems. The data was analyzed using statistical packages of social sciences and different tests were performed including Chi-square and standard deviation and square tab. **Results:** Statistics show that 27% of freelancers were suffered from neck and shoulder pain, 43% suffered from neck pain along with other symptoms and followed by headache in which 34% rarely suffered from headache, 38% suffered from moderate headache and 28% from severe headache. Emotional findings show that 44% faced frustration, anger and sadness to some extent. **Conclusions:** The neck discomfort due to working online increases with sitting still for more than 1 hour, making physical activity difficult as well as making lifestyle change. A significant Association was found between lifestyle changes due to neck pain, neck pain intensity with online working.

INTRODUCTION

Freelancing intends to fill in as a free organization as opposed to be utilized by another person [1]. Laptop and desktop computers are extensively used in multiple domains of freelancing industry either at home or small agency [2]. Neck discomfort that outcomes from shifting head down to take a glance at a cell phone, PC, screen, and additionally if someone's work from home set up, isn't ergonomic at all and it will result with the beginning of musculoskeletal issue running from neck shoulder [3]. Neck pain was observed among smartphone users because of postural changes due to the small screen size of the devices [4]. The risk factors related with the onset of work-related musculoskeletal illnesses among workers who use computers extensively can be classified into two types: occupational and non-occupational [5]. Repetition force, incorrect or fixed posture, length of exposure, and vibrations are all indicated as key risk factors in the workplace [6]. freelancing workers have a higher prevalence of Work-related Musculoskeletal Disorders, which could be linked to work style as risk factors for

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musculoskeletal disorders [7]. Age, high quantitative job demands, limited social support at work, poor computer workstation design and posture, sedentary work position, repetitive work, and precise work are all risk factors for neck pain in employees. [8]. It also has been indicated that faulty postures contribute to the onset of neck pain syndromes with further loss of cervical spine extension [9]. Freelancers are of particular interest because they spend multiple hours in front of computer at the workplace either home or net cafe and the prevalence of neck pain in this occupational group remains high [10]. The usage of the computer mouse has also been identified as a new work hazard that might cause health problems in the neck and upper extremities [11]. If a person's work from home setup isn't ergonomic, it might lead to neck pain that includes neck, shoulder, and back pain [12]. Among these different danger factors, business related psychosocial factors seem to assume a significant part as indicated by Ariëns *et al.*, [13]. Recognizing factors that incline people to tenacious neck issues may add to essential or auxiliary anticipation [14]. A physical ergonomic approach (e.g., an arm board) was much more useful in decreasing neck discomfort severity than no ergonomic intervention [15].

METHODS

It was a cross-sectional study. Convenient sampling was used for the sampling purpose. 100 freelancers were included into the study using the formula; $\mathbf{n = Z_{\alpha/2}^2\, p(1-p) / d^2}$ The data was collected from different freelancers with online interactions and discussions. The duration of the study was 6 months after approval. Volunteers were included in the study based on inclusion and exclusion criteria. Freelancers aging 21 to 40, Both male and female, Participants having at least 2 years' history of freelancing and, Participants with no known major health issue and neck injury were included in the study. Person with a diagnosed history of chronic neck pain, Participants having previous history of surgery and neck trauma, Participants having previous neck surgery, Participants having any psychological issue, Participants having vision or hearing difficulty, participants having diagnosed musculoskeletal issue and, participants having any active infectious disease such as TB, were excluded from the study. A convenient modified questioner as (Google form) was used for data collection. The data was analyzed via SPSS version 26.0. The Qualitative variables like gender were presented as frequency & percentages along with other quantitative variables like pain intensity. Association of online working with other variables was measured through Chi-square test, where p-value ≤ 0.05 was taken as significant.

RESULTS

21 to 40 years old adults were enrolled in the study. All participants had filled online questionnaire. There was no drop out in this study. Subjects participated in study fulfill all the parameters. Out of 100 participants 76(76%) were belongs to age group of 21-25year. 16 (16%) were belongs to age group of 26-30year. 5(5%) were belongs to age group of 31-35year. 3(3%) were belongs to age group of 35-40year. Out of 100 participants 77 (77%) were male and 23(23%) were female. Out of 100 participants 29(29%) were spending 0-4 hours per day. 36 (36%) were spending 5-8 hours per day.35 were spending more than 8hours per day. Out of 100 participants 58(58%) were using desktop computer. 31(31%) participants were using laptop. 8(8%) were using smart phone. 3(3%) were using all these devices.

Table 1: showing frequency of demographics and other variables

Variables		Frequency (%)
Age of the respondent	21-25	76 (76.0)
	26-30	16 (16.0)
	31-35	5(5.0)
	35-40	3(3.0)
Gender of the respondent	male	77(77.0)
	female	23(23.0)
Hours spend working online	0-4hours	29(29.0)
	5-8hours	36(36.0)
	more than 8hours	35(35.0)
Device used for online working	desktop computer	58(58.0)
	Laptop	31(31.0)
	smart phone	8(8.0)
	All	3(3.0)
Symptoms due to online working	neck and shoulder pain	27(27.0)
	neck pain plus others symptom	43(43.0)
	other symptom except neck pain	30(30.0)

The table 2 showed the Chi-Square results i.e., p value = 0.050. In this case 5% confidence interval consideration tells us that p< 0.05. The Alternative hypothesis would be accepted which tells that there is significant relationship between life style changes and neck pain.

Table 2: Showing Association of pain intensity & online working

Pain intensity						p-value
Symptoms due to online working	None	Mild	Moderate	Severe	Very Severe	
Neck and shoulder pain	6	8	5	7	1	.037
Neck pain plus others symptom	1	7	24	8	3	
Other symptom except neck pain	4	10	9	6	1	

The Alternative hypothesis would be accepted which tells that there is significant relationship between neck pain and pain at its worst due to working online.

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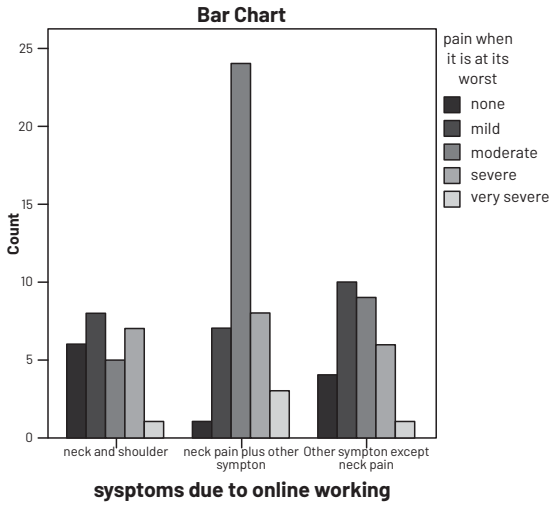

Figure 1: Showing the Association of pain intensity & online working

DISCUSSION

The current study statistics shows the prevalence rate of neck pain with associated symptoms among freelancers is 43%. 27% freelancers suffered from neck and shoulder pain due to online working. similar results were found by a study of Lindegård *et al.*, who studied about prevalence of neck pain and it was seen that neck pain is more common in women than in men. 43 % of population reported neck pain [16]. Taneja *et al.*, whose study revealed that 46% subjects were suffering from discomfort, mild to moderate muscle stiffness in the neck and the stiffness related to work [17]. In contrast a study by Keown & Tuchin found out that 40.7 % students were using smartphones for longer duration and 58 % of students reported neck pain in using the smartphones. Which concluded that longer durations are causing the neck pain along with another health problem like dizziness [18]. Another study by Namwongsa *et al.*, concluded that most painful region after usage for about 12 months was neck (32.50%) [19]. A study by Shan *et al.*, showed that the incident was 50 percent for neck pain much higher than 24 percent for shoulder pain and 34 percent for arms and wrists [20]. Research by Sikka *et al.*, concluded that the prevalence of Cervical pain with the percentage of 71.2 was dominant of all pains with headache on 2nd number with 63.3% and on 3rd number there was irritability with 54.5% and depression 19.69%, strains on eyes 36.8 % etc [21]. Van der Zwan *et al.*, conducted a study whom results showed that neck pain is 75% of the population [22]. Stock and Tissot found out that the incident of neck pain is 42 to 63 percent annually it is estimated as more as 90% of employee are spending 4 hours a day, so it should be highlighted that workplace for employees must be ergonomically friendly to prevent incident of neck pain, so in order to reduce the expenses so to increase productivity [23].

CONCLUSIONS

According to the findings of the current study, freelancers have a high prevalence of neck pain. It was determined that the incidence of neck discomfort due to working online increases with sitting still for more than 1 hour, making physical activity difficult as well as making lifestyle changes, but there is no linkage between demographic variables and neck pain caused by working online. A significant Association was found between lifestyle changes due to neck pain, neck pain intensity with online working.

Authors Contribution

Conceptualization: TG
Methodology: HA, AK
Formal analysis: MS, HA
Writing-review and editing: TF, UBS, HJ, JA

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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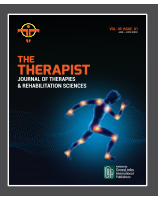

Original Article

The Prevalence of Coccydynia among Postpartum Females in Allama Iqbal Memorial Teaching Hospital, Sialkot

Saman Shah[1], Sana Muzammil[1], Ghannia Khalid[1], Rameesha Javed[1], Danyal Ahmed[1], Faiza Altaf[1] and Amna Khalid[2]*

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ABSTRACT

The coccydynia refers to the pain in the coccyx. Its incidence is increasing due to sedentary lifestyles. The problem is commonly seen in postpartum females caused due to prolong sitting, poor breast feeding position or due to internal and external trauma during labor. **Objective:** To evaluate the prevalence of coccydynia and its association with postpartum females in Allama Iqbal Memorial Teaching Hospital, Sialkot. This is an observational study and convenient sampling technique is used in it. **Methods:** This study includes 90 postpartum females of age between 20 to 44. Data were collected by using a questionnaire containing 16 questions. **Results:** Out of 90 postpartum females, the total number of patients having tailbone pain were 86.7% whereas, 8.2% participants had no pain after delivery. **Conclusion:** The study concludes that the prevalence rate of coccyx pain is very high in postpartum females, due to several reasons. The study mainly focus on providing guidance to the females about the correct positioning, exercises and postural guidance in order to maintain the active lifestyle.

INTRODUCTION

Coccydynia refers to pain in the region of the coccyx [1]. The coccyx is the last segment of spine which serves as an attachment for the muscles of pelvic floor and other muscles which plays a role in generating pain [2]. Low back pain is very common among females after child birth regardless of the delivery procedures [3]. Postpartum coccydynia is pain that appears as soon as a sitting position is adopted after delivery [4]. A lot of changes occur in women body during hormonal changes as growth changes the actual design of tendons and joints including coccyx [5]. There are some studies that explained about some risk factors that could cause pain i.e., age, smoking, BMI, history of previous pelvic girdle pain (PGP) and psychological factors [6]. As after delivery hormones get back onto their normal levels so Bjelland claims that emotional distress is the only factor that could result in PGP after childbirth [7]. A recent research was conducted which showed a strong relationship between the coccyx pain, pelvic floor problems and pelvic pain [8]. The sacrococcygeal ligament are prone to damage during vaginal delivery and an acute trauma to coccyx may also occur through the birth canal [9]. A recent study was conducted in Faisalabad which showed that the tailbone pain has also a relationship with delivery procedure, during

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the child birth [10]. Slight trauma can also happen if female sit on a hard, narrow, or unpleasant surface for an extended period of time [11]. A postpartum female needs to be cautious and need some specific instructions and considerations about her posture, position and comfort especially during breast feeding [12]. Modern furniture is not good for a correct position while breastfeeding while sitting which directly puts pressure on coccyx [13]. A study was conducted in 2019 which showed the association of breast feeding position with musculoskeletal pain in postpartum mothers of Rawalpindi and Islamabad [14]. Body mass index and women who delivered more than two times had usually more prevalence of tailbone pain [15]. A study conducted in 2019 in Sargodha also claimed that 62.2% women experience pain after first pregnancy and 37.8% women experience pain after second delivery or more [16]. The gold standard treatment for coccydynia is the procedures that do not involve any type of surgery. Stretching, manipulation, massages in coccygeal region and proper postural training is involved in the management of coccydynia [17]. If all management procedures failed, patient can go through coccygectomy [18].

METHODS

This cross-sectional study was conducted in Allama Iqbal Teaching Memorial Hospital, Sialkot, Punjab, Pakistan. It was completed over a period of 4 months . A sample size of 90 individuals was selected comprising of postpartum females suffering from coccydynia. Convenient sampling technique was used. Survey was done and questionnaires were given to collect sample. Postpartum females, females with no chronic illness with age group 20-44 years were included in the study. Pregnant women, females with history of spinal injury, rheumatoid arthritis, history of back pain and ankylosing spondylitis were excluded in our study. Patients received the questionnaire via forms and verbal instructions. Data were collected from vaccination center and gynecology ward. The questionnaire included questions such as age, weight, height, BMI, no. of pregnancies and delivery procedure. The statistical analysis was performed by using SPSS 21.0 [19]. Chi square tests were also performed to check either the variables we used have association with each other or not [20]. Epitool was used to calculate sample size by applying cochrane formula. Level of confidence was 95% ,whereas Level of precision was 0.05.

RESULTS

A total of 90 postpartum females completed the questionnaire. Among 90 females 26.7% were aged between 25-29 years. According to Table 1, Mean age of participants was 32.62. Minimum age was 20 and maximum age of participants was 44. Standard deviation was 7.499.

Table 1: Participant's Age

	N	Minimum	Maximum	Mean ± SD
Age	90	20	44	32.62 ±7.499

Table 2 showed that, the results showed that among 90 patients, 65.6% patients agreed of having tailbone pain while 21.1% strongly agreed that they had tailbone pain. So, total number of patients having coccydynia is 86.7%. Out of 90 participants 5.6% participants were neutral and 7.8% participants disagree. The study revealed that prevalence of coccydynia is most frequent among housewives (76.7%) as compared to professionals (23.3%) like babysitters or teachers.

Table 2 : Prevalence of Coccydynia

		Frequency (%)
Do you feel pain in tail bone after delivery?	Disagree	7 (7.8)
	Neutral	5 (5.6)
	Agree	59 (65.6)
	Strongly Agree	19 (21.1)
	Total	90 (100)

According to Table 3, 34.4% participants had delivered their baby through episiotomy, while 33.3% participants had undergone SVD and 32.2% participants had C-section. So, most of our participants had undergone episiotomy. Results showed that 96.5% participants had coccydynia after C-section while 93.5% participants had coccydynia after episiotomy and 70% participants had coccydynia after spontaneous vaginal delivery or SVD. Many other factors which can aggravate the pain were breastfeeding, prolonged sitting, baby care, sedentary lifestyle, bowel movements, climbing stairs and coughing.

Table 3: Delivery procedures and coccydynia

		Do you feel pain in tailbone after delivery ?				
		Disagree	Neutral	Agree	Strongly Agree	Total
Through which procedure you delivered your baby?	Episiotomy	2	0	27	2	31
	SVD	5	4	13	8	30
	Cesarean	0	1	19	9	29
	Total	7	5	59	19	90

p-value = 0.003

DISCUSSION

After completion of this study we found that 78 out of 90 females agreed which means that 86.6% suffer from coccydynia in postpartum period. By this study we came to know about different factors that aggravates coccyx pain which includes breastfeeding, delivery procedure, prolonged sitting, coughing, sneezing and baby care. A research conducted in 2019 on coccydynia in women after

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child birth discussed the factors of coccydynia after child births which were obesity, short perineum and difficulty in expulsion stage or instrumental vaginal delivery. This study discussed the factors but lacks in finding the prevalence of coccydynia after child birth [13]. But in our study, we find that 86.5% females suffered from coccydynia after childbirth. An observational study conducted on postpartum women from Maula Bakhsh DHQ Sargodha checked the causes and risk factors of coccydynia and it concludes that 55% of women have coccydynia after first pregnancy and 37.8% after second or more pregnancy [16]. But in our study, there is no association found between coccydynia and number of deliveries. A study was conducted in 2019 to check the association of breast feeding position with musculoskeletal pain in postpartum 54 mothers of Rawalpindi and Islamabad, this study stated that the musculoskeletal problem may occur because of bad posture during breast feeding [14]. In our study the prevalence of females having pain in coccyx during breastfeeding were 43%. In July 2012, a cohort study was conducted to investigate causes, clinical and imaging highlights and reaction to treatment of chronic coccydynia in adolescents. Number of 53 patients with chronic coccydynia were considered for 1-4 years. Trauma was the main cause of coccydynia in 20 cases. Obesity was not included in this research as risk factor [21]. In current study, BMI was calculated and 66.6% females were found over weight but no significant correlation was found between obesity and occurrence of coccydynia.

CONCLUSIONS

This study was conducted to check the prevalence of coccydynia among postpartum females in Allama Iqbal memorial teaching hospital Sialkot. The findings of the study provide a baseline of information about prevalence of coccydynia and its association with postpartum period. The results concluded that the prevalence rate of coccyx pain is 86.7% which is very high in postpartum females. Results showed that 96.5% participants had coccydynia after C-section while 93.5% participants had coccydynia after episiotomy and 70% participants had coccydynia after spontaneous vaginal delivery or SVD. Poor breast feeding position also playing role in aggravating coccyx pain (43.3%). Among 90 Participants, 54.4% females experienced more pain in coccyx while climbing stairs. Some other factors which can provoke coccyx pain were bowel movements, laughing, coughing, sneezing and baby care.

Authors Contribution

Conceptualization: SS, FA, AK
Methodology: RJ
Formal analysis: SM
Writing-review and editing: GK, DA, SS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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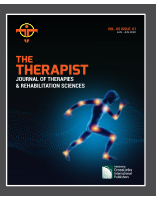

Case Report

Stuttering's Effect on Job Efficacy in Five Participants

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ABSTRACT

Stuttering also known as stammering is a speech disorder, in which the flow of speech is disrupted by involuntary repetitions and prolongations. Adults who stutter suffers with many problems at workplace due to speech disfluencies. To evaluate the effect of stuttering on job efficacy. A population both male and female between the age of 30 to 40 years were selected. Data for the stuttering patients were collected from different job places of Lahore. All these stutters were given the consent form. It confirmed their willingness to participate in interview. Interview guide was designed as per the criteria of research questions. Interview guide was evaluated and reviewed by two external members. Interviews were conducted on WhatsApp audio or video call, zoom meetings and face to face, according to the availability and willingness of participants. Interviews were recorded for further analysis. Recorded interviews were transcribed which were further coded, and subthemes were extracted. On the basis of subthemes, themes of the research were decided. Results shows that only those individuals who stutter doing their own business or running their own NGO's (Non-Governmental organizations) are satisfied with their jobs/works. Individuals doing any kind of job in a private company are not satisfied with their jobs because of stuttering. **Case Summary:** Stuttering has a negative impact on their job performance and employment. Stuttering made them lose their confidence in front of any stranger, senior or boss. People usually mock them because of stuttering. These issues lead them towards anxiety, complexity and frustration.

INTRODUCTION

Stuttering or stammering is a communication disorder that hinders person's ability to speak fluently. When a person speaks his/or speech is usually fluent i.e. without any stops. But when a stutterer speaks it seems like something is stopping him/her from speaking [1]. That something could be neurological, developmental or psychological. Neurological stuttering is usually acquired but it can be congenital as well due to some neurological trauma i.e. traumatic brain injury [2]. Developmental stuttering occurs usually in developmental age of child when a child is leaning to speak. It is most common type of stuttering that is usually observed. Closely related to developmental stuttering is normal non-fluency [3]. Normal non-fluency is defined as typically developmental errors of speech in which a child still learning to speak if these errors persist beyond developmental age than this is diagnosed as developmental stuttering otherwise normal non-fluency disappear on its own. Psychogenic stuttering usually results from sudden psychological trauma. i.e., death of someone very close, or something happening out of blue [4, 5]. Stuttering is characterized by four core behaviors which are repetitions, prolongations, pauses and block. In repetition patient seems to stuck on a particular sound or word. It is categorized into two types i.e. part word repetition or full word repetition for example if a patient is intending to say water, in part word repetition he would keep on repeating wa-wa-wa-water and in case of full word repetition he would say water-water-water. It seems like patient is stuck and he is unable to say next word [6]. In prolongation patient seems to stretch sounds or words unnecessarily for example "waaaaater". While pauses are determined by inappropriate and unnecessary wait or gap during speech. For example, "Give (pause) water". In block patient is stuck in such a manner that it seems that he is

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willing to say something but is not able to do so. Most of the times core behaviors are accompanied by secondary behaviors that include eye blinking, facial grimacing, nasal grimacing and head jerk etc. [7]. Stuttering is assessed, diagnosed and treated by speech and language pathologist/therapist. Stuttering is categorized into mild, moderate and severe stuttering depending upon severity. Different strategies and therapies like fluency shaping or stuttering modification is used by speech and language pathologist to treat stuttering [8]. "The Impact of Stuttering on Development of Self-Identity, Relationships, and Quality of Life in Women Who Stutter" was conducted by Charn Nang, Deborah Hersh and Sau Re Lau. This qualitative study involved recruitment of 9 women who stutter (aged 35–80 years) through a support network of people who stutter in Western Australia. All the women had received some form of speech therapy for stuttering, and they came from diverse cultural backgrounds [9]. Individual, semi structured interviews were conducted, recorded, and transcribed verbatim. Data were managed with NVivo 10, and thematic analysis was used to identify recurring themes across the data. Data were coded independently by the researchers and refined through group discussion. Participants also completed the Overall Assessment of the Speaker's Experience of Stuttering. It was concluded that stuttering has a pervasive impact on all aspects of women's lives [10]. A web-based questionnaire survey of 730 adults drawn from the general public throughout Japan was conducted in study "Public attitudes toward people who stutter in the workplace: A questionnaire survey of Japanese employees". It gathered information on respondents' demographics, contact experience with people who stutter, knowledge of stuttering, and attitudes and experiences toward stuttering at work, using a Likert-type scale. To investigate the factors associated with their attitudes and experiences toward stuttering at work, respondents' demographic information and contact experience were entered into a multivariable model using ordinal logistic regression analysis. It was concluded that it depends on attitudes of fellows or colleagues that boost or drop morale of stutters [11]. This study intends to take into consideration the problems faced by adult stutters at their workplace. Many quantitative studies have been conducted, which shows the problems and issues that has been faced by adult stutters. For this study, Qualitative Interview method was selected because actual sufferings and issues can only be known by asking open ended questions. Significance of this study is, it aimed to know actual problems and effects that adult stutters face at their work due to the stuttering. It was a qualitative study that portraits a picture of effects of stuttering on job efficacy. Both male and female's stutters between the ages of 30 to 40 years, were selected to take part in the study. Data for the stuttering patients were collected from different job places of Lahore. All the participants were either doing private job or running their own business. All these people were given a consent form that confirmed their willingness to participate in the interviews/study. For interview, an interview guide was developed in Urdu language and reviewed by two experts. Necessary changes were made and then it was used to conduct the interview. Interviews were conducted online as it was convenient for the participants. Day and time were decided according to the availability and willingness of the participants. Interviews duration was of maximum 40 minutes and minimum of 20 minutes. Interviews were recorded for further analysis with the consent of the participants. Recorded interviews were transcribed which were further coded and sub-themes were extracted. Thematic analysis was done for the analysis of the transcription. On the basis of sub-themes, themes were developed. Keywords were translated from an English language expert.

Table 1: Collected Sample Information

Age Range		30-40 years
Total Samples		**5**
Education	Minimum	B.A.
	Maximum	MBA
Gender	Male	4
	Female	1
Work Setting	Private	5
	Public	0

Table 2 has depicted the Thematic analysis, which was done on the basis of interviews taken from adult stutters. Major themes identified were Job Satisfaction, Employment opportunities, Communication Gap, Negative Effects of Stuttering and Future perspective. On the basis of these themes, subthemes were generated. These subthemes have been drawn through the verbatim of the adult stutters, given in the column next to the keywords.

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Table 2: Demographic Table with the response of candidates categorized on theme and subtheme

Theme	Sub-theme	Keywords	Translation
Job Satisfaction	Satisfied who are self-employed Not satisfied who works in private companies	جی ہاں میں اپنے کام سے مطعمین ہوں' مطعمین ہوں بالکل' ابھی میں مطعمین نہیں ہوں ابھی میں نے آگے بڑھنا ہے'	Yes, I am satisfied with my work. (P1, L1) Completely satisfied. (P4, L1) I am not satisfied; I have to excel more yet. (P5, L1)
Employment opportunities	.Non-availability of equal opportunities .Unequal pay packages .Effects working capabilities .Non availability of jobs according to the desire/capabilities Ratio of firing is high	بالکل نہیں ہکلانے والے افراد کے لیے کوئی خصوصی مواقع فراہم نہیں کیے جاتے' جی نہیں ہکلانے والے افراد کے لیے یکساں مواقع فراہم نہیں کیے جاتے کیونکہ ہم ہکلاتے ہیں اس لیے ہمیں پیچھے رکھا جاتا ہے۔ نہیں ویسے تو خواہش کے مطابق نہیں ہے مگر بہت بہتر ہے'جی نہیں یہ ملازمت میری خواہش کے مطابق نہیں ہے کیونکہ میں یہ ملازمت نہیں کرنا چا ھتا تھا'	.No, stuttering person is not provided with particular platforms. (P2, L4-5) .No, stuttering person are not provided with equal opportunities because we stutter, and we are stepped back. (P1, L4-6) .No, not according to the desire, however a lot better. (P3, L2) .No, this employment is not according to my desire because I didn't want to do this job. (P1, L2-3)
Negative Effects of Stuttering	.Mocking.Lack of opportunities .Increase in stress Lack of confidence	ہکلاہٹ کی وجہ جب کوئ لفظ بولا نہیں جاتا تو مشکل ہوتی ہے، میری بات کو سمجھنے میں تو میں خود بھی پریشان ہو جاتی ہوں۔ بعض اوقات دوستوں میں ہکلانے کی وجہ سے میں احساس کمتری کا بھی شکار ہوتا ہوں۔ ہکلاہٹ کی وجہ سے بہت مشکلات کا سامنا کرنا پڑتا ہے۔	.I distressed when I am unable to communicate because of stuttering. (P5, L3-4) .Sometimes, because of stuttering I entangle in complexity. (P3, L29-30) Face a lot of difficulties because of stuttering. (P5, L11)
Future perspective	.Positive for future endeavors .In search of better job Social work for other stutters	بالکل میں بہتر جوب کی تلاش میں ہوں، زیادہ یہ ہوتا ہے کہ لوگ ہمارا مزاق نہ اڑائں۔ میں اپنے جیسے لوگوں کے لیے کام کرنا چھتا ہوں۔ ملازمت کے اعتبار سے اگر مجھے جوب ملے جو کہ مشکل ہے تو میں ضرور کروں گا۔	.Yes, I am searching for a better job. People must not mock us. (P4, L18-20) .I want to work for the people like me. (P4, L34) If I find a better job, which is difficult, I would definitely do it. (P1, L29-30)

DISCUSSION

The purpose of this study was to identify the experience and problems faced by the people who stutter. The problems and experiences were analyzed through the approach of Thematical Analysis. In this study it has been found that only the individuals who stutter doing their own business or running their own NGOs (Non-governmental organizations) are satisfied with their jobs/work. Individuals doing any kind of job in a private company are not satisfied with their jobs because of stuttering as one of my participants said, "جی نہیں یہ ملازمت میری خواہش کے مطابق نہیں ہے کیونکہ میں یہ ملازمت نہیں کـــــــرنا چا ھتا تھا". Stuttering and its impact on the job opportunities and promotion is a global issue. A survey was conducted on 232 people, age 18 years or older, indicates that 70% people who stutter do not get promotion. Over 33% people think, stuttering effects their job performance and 20% have actually not promoted due to stuttering [12]. These kinds of problems directly lead a person to unsatisfaction towards their jobs. Based on the information gathered, people with stuttering issues are not provided with equal opportunities or any other particular platform where they could exhibit their capabilities [13]. As per the responses, all of the people who stuttering faces communication gap either in front of their boss or any other stranger. According to a study, employment which do not require high communication skills have enabled stuttering people to keep up pace with the world but for the works which require communication skills leave a great impact on the performance, confidence, and the life, especially on the job satisfaction, of the people who stutter [14]. People who experience communication gap due to stuttering are unable to attain a good designation in more prestigious professions or companies [15]. In this study it has been established that people who stutter, experience communication gap as one of my participants said, "مجھے اپنے باس اور کسی بھی نئے بندے سے بات کرنے میں کمیونیکیشن گیپ کا سامنا کرنا پڑتا ہے رات کو سوچنا پڑتا ہے کہ میں نے کیا بات کرنی ہے اور کیســـــے کـــرنـــی ہے" It is not difficult to find people. who stutter, with negative impact on their employment or on their entire career [16]. In this study it was observed that people with stuttering issues have a great impact on their employment. People with this kind of issue sometimes practice what they have to say to their boss in the morning, which is very disturbing and putting them in complexity. It puts them in a distressed situation when they are unable to communicate because of stuttering, which leads them rather to stay quiet or makes them lose their confidence as one of my

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participants stated, "ہکلاہٹ کـــــی وجہ جب کوئ لفظ بو لا نہیں جاتا تو مشـکل ہوتی ہے، میری بات کو سمجھنے میں تو میں خود بھی پریشـــان ہو جاتی ہوں۔
بعض اوقات دوستوں میں ہکلانے کی وجہ سے میں احساس کمتری کا بھی شکار ہـــــوتا ہـــــوں". People mock them because of stuttering. According to Yarzebinski study there are two reasons for unequal opportunities for the people who stutter: (i) The negative attitude of the normal people towards disabled people or the mocking of disabled by non-disabled. (ii) The negative attitude of the disabled people developed for them. This study further states that stuttering people can experience worst situations like rejections, anxiety, penalty, or even withdrawal which lead them towards frustration. People who stutter, either underemployed because of the negative attitude of the society or their own attitude for themselves [17]. It has been well stated in research that non-disabled people have negative view for the people who stutter. In a literature review it has been found that this negative attitude is present in a huge variety of people, including school administrations, college students, teachers, business owners and even speech-language pathologists [18]. Even nurses have deemed physicians who stutter, to be more tense, afraid, less mature, intelligent, and nervous than the physicians who do not stutter [19]. One of the enormous survey states that employers hold a less positive attitude towards the people who stutter. According to Çağlayan and Özdemir study approximately 30 % people believe that stuttering interferes with their job efficiency or promotion. 40% believe that stuttering interacts with their promotional possibilities and 44% think they must look for the employment which require little speaking [20]. This study also revealed that most people are looking for a better job where they could get equal opportunities to excel better in life.

CONCLUSIONS

It is concluded that adult stutters were not satisfied with their jobs. Stuttering has a negative impact on their job performance and employment. Stuttering has made them lose their confidence in front of strangers, seniors and boss. They were suffering with workplace bullying too. These and other work-related issues has lead them towards anxiety and frustration. Only few self-employed adult stutters reported to be satisfied with their work, because they have their own businesses.

Authors Contribution

Conceptualization: HN
Methodology: SR, MZ
Formal analysis: SY
Writing-review and editing: FE, SN

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest

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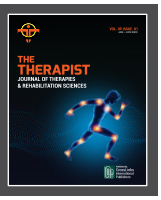

Systematic Review

Effect of Whole-Body Vibration During Chemotherapy in Improving Functional Outcomes of Patients with Malignancies

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ABSTRACT

The use of functional outcome scales to see the effect of whole-body vibration on the patients having malignancies and going through chemotherapy. **Objective:** To perform a systematic review to see the effects of whole-body vibration on patients having chemotherapy. **Methods:** Using the specified keywords, a search was conducted in the TRIP, PEDro and PubMed databases. The studies were picked based on their eligibility for evaluation. The articles having full length were included which specified the effect of whole-body vibration technique in the patients having malignancies and going through chemotherapy. **Results:** According to the exclusion criteria, three publications were included, all related to patients having chemotherapy. Reported were the effects of WBV both in sensory and motor symptoms. **Conclusions:** It was concluded that by using the whole-body vibrator the debilitating effects of the chemotherapy can be controlled or minimized such as fatigue, weakness and bone loss. It is comparative to high intensity exercises which account behavioral barriers and certain risks.

INTRODUCTION

Cancer is a group of disease characterized by unchecked and abnormal growth of cells having two types; Benign in which the disease or tumor remain localized neither invading surrounding cells nor spreading throughout the body. The other type is Malignant in which it spread in the surrounding tissues and in some cases throughout the body. In Pakistan, according to a survey, 148000 people are diagnosed with tumor every year with leukemia and non-Hodgkin lymphoma being most common [1]. The rate of incidence of lymphoma is 5.3/100,000 and 4.1/100,000 in males and females respectively with five-year survival rate of 87% [2, 3]. It is most common in early adulthood, particularly people in their 20s and the older above 60 years of age [4]. The incidence of leukemia is 4.1/100,000 in males and 2.1/100,000 in females [5]. with five-year survival rate of 61.4% [6]. It is most common in early ages of teens and the older age of 55 years and above [7]. In malignancies several treatments are used like surgeries, radiation

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therapy, immunotherapy, hormone therapy, bone marrow transplant, cyber knife and one being chemotherapy. In chemotherapy the powerful drugs are used to kill the fast-growing cells, where it has the beneficence of killing abnormally growing cells it also has an adverse effect like decreasing the immune system of body leading to fatigue, weight loss, hair loss, osteoporosis, general feeling of sickness, anxiety, depression and other debilitating effects on body. To deal with the adverse effects of chemotherapy certain physical exercises and rehabilitation programs are used. Evidence has shown the effects of whole-body vibration in this phase as it stimulates the neuromuscular system without having adverse effects on blood pressure [8]. Studies have also demonstrated the value of whole-body vibration workouts in the rehabilitation of individuals with chronic illnesses. A growing number of studies are looking into how whole-body vibration affects cancer survivors' functional exercise ability, weariness, weakness, incontinence, bone loss, and peripheral neuropathy [9]. WBV is likewise proposed as a possibly protected, low power option in contrast to current modalities in work out prejudiced, practice aversive or portability restricted people, without the expected gamble or social obstructions related with extreme focus work out [10]. Constructive outcomes following a month and a half of moderate WBV preparing with a transcendently vertical vibrating gadget has been accounted for in old standardized subjects in contrast with different mediations [11]. It is considered to be gentle on joints and has least effects on the blood pressure, heart rate decreasing the complications [12]. Ongoing examinations demonstrate that very low-level mechanical signs conveyed deep down in adequate recurrence reach can be anabolic. In the event that these mechanical signs can be successful and painlessly sent into the standing human to arrive at those destinations of skeleton at the most serious gamble of osteoporosis, for example, the hip and lumbar spine, then, at that point, vibration could be utilized as extraordinary, non-pharmacological mediation to forestall or switch bone misfortune [13]. Entire body vibration is another sort of activity that has been progressively tried for the capacity to forestall strong decay, bone breaks and osteoporosis. Contrasted with conventional preparation systems entire body vibration needs essentially less time and thusly could be anticipated to arrive at a higher consistence in already idle patients [14-16].

METHODS

PubMed, PEDro and TRIP databases were searched by using medical subject heading (MeSH terms). These databases were selected due to their large and open access to medical and rehabilitation material. A PICO (population, intervention, comparator, outcome) question were used to define the keywords. The PICO question was 1) population= diseased population, patients having malignancy and going through chemotherapy 2) intervention= whole body vibration 3) placebo or any other treatment 4) outcome= functional outcome of the patients according to its scale or sensory and motor outcomes. The first search was done using the keyword "whole body vibration". In PubMed it searched 2378 articles whereas in PEDro this term searched 392 articles and in TRIP database 1249 articles. The second search was done using the keyword "whole body vibration and chemotherapy" in the same databases. In PubMed it searched 50 articles whereas in PEDro it searched 3 articles and in TRIP database 1. The all gathered publications were then screened on the basis of inclusion and exclusion criteria. In the keyword searches, the publications having full length papers were included to make a pool for the systematic review. The studies were included if they were: 1) randomized controlled trial (RCT) 2) single group experimental study (crossover design) 3) pilot studies 4) publications in English language 5) described the effects of WBV in patients having chemotherapy and 6) used other techniques to compare the outcome of WBV. Then, a flow chart was design to elaborate the steps in the selection of the full papers and review (Figure 1)..

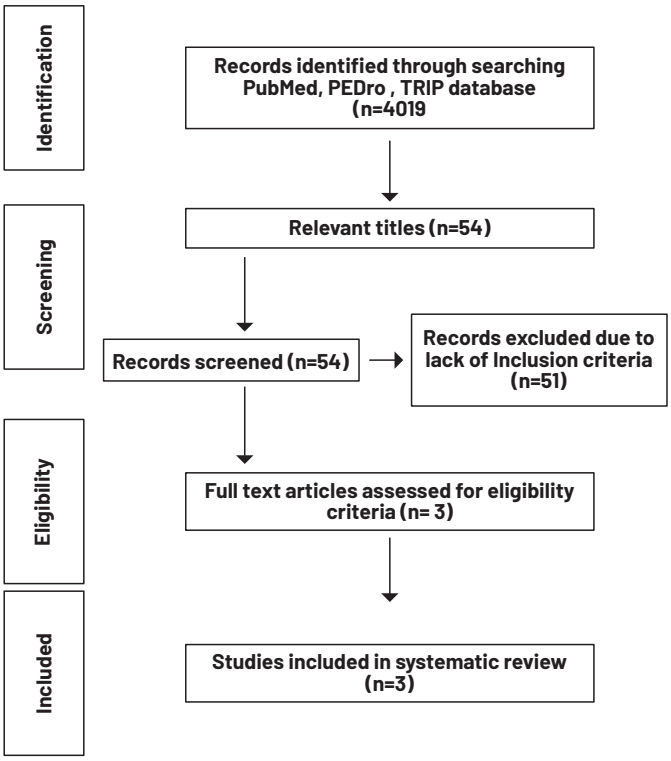

Figure 1: Prisma Guidelines Flow Chart for Literature Search and Study Selection

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Exclusion criteria was set according to which the articles were screened: Articles were excluded if they were: 1) published in any other language than English 2) other than experimental studies 3) with any other disease than malignancy 4) population having malignancy but not going through chemotherapy 5) studies on physiological phenomena 6) studies documenting effects on some specific limb or part of body and 7) duplicate papers. The studies on population other than going through chemotherapy was excluded as the purpose of this review paper was to evaluate the effect of whole-body vibration on the patients going through chemotherapy when they cannot continue their daily life activities due to weakness and fatigue leading to debilitating effects like bed ridden and bone loss. Despite seeing the effect on any one limb or specific part their overall functional outcome was assessed. The PEDro scale was used to classify the studies included in the systematic review. According to which three studies which has been included in the study has been ranked on the basis of score attained with 0-4 being poor, 5-6 being fair and 7 -10 being high. The Table 2 and 3 was drawn to check the methodological quality of the selected studies which is as follows.

Internal validity-statistical reporting	Streckmann F, Lehmann HC [17]	Pahl A [18]	Schonsteiner SS [19]
Random allocation	+	+	+
Concealed allocation	+	+	+
Baseline similarity	+	+	+
Subject blinding	_	_	_
Therapist blinding	_	_	_
Assessor blinding	+	_	+
Follow up>80%	+	+	+
Intention to treat analysis	_	_	_
Between group comparison	+	+	+
Point measures and measures of variability	+	+	+
PEDro scale	7	6	7
Eligibility criteria	+	+	+

Table 2: Methodological quality of studies included

Score	Classification
0-4	poor
5-6	fair
7-10	high

Table 3: Scoring and interpretation according to PEDro scale

So of the three studies, according to the scoring on PEDro scale one study is ranked fair wheras, two attained high score on it. The final levels of evidence and grades of recommendation for the effect of WBV on functional outcomes in patients having malignancies and going through chemotherapy are summarized in Table 4 below, using the grading system of the Scottish Intercollegiate Guidelines Network[20].

	Findings	Levels of evidence	Recommendations
Streckmann F, Lehmann HC	Positive effects	1++	A
Pahl A	Positive effects	1+	A
Schonsteiner SS	Positive effects	1++	A

Table 4: Quality of study according to PEDro Scale

RESULTS

The three studies were assessed to know their main findings. All of them showed the significant changes in the outcome of whole-body vibration and proved to be an alternative to the strenuous exercises which may cause health hazards to the patients going through chemotherapy. These findings are illustrated in Table 5 as follows:

Researchers	Study population	Intervention details	outcomes	Main findings
Streckmann F, Lehmann HC	Malignancy + chemotherapy	2 sessions for 6 weeks IG=patient standing on the vibration board with each session consisting of 4 progressing sets of 30 sec to 1min , with frequency from 18 to35Hz and amplitude of 2_4mm. 1 min rest interval between exercises. CG= balance exercises on uneven surface, 4 exercise per session with each exercise performed 3 times for 20sec, with a rest of 40 sec between each and 1min between each exercise.	Functional outcomes + sensory reflexes	WBV proves to be a good alternative treatment for the patients improving their sensory and motor symptoms.
Pahl A	Malignancy + chemotherapy	3 sessions per week, lasting 20 min IG=3 set of 2 to 4 exercises on Galileo sport vibration board for 30 to 60sec with 30 to 60 sec rest between exercise and 60 to 120sec between sets CG= aerobic exercise for 20 min with periods of rest	Functional performance	WBV proved to be a good alternative method to aerobic exercise during intensive chemotherapy to maintain patients' optimal functional status
Schonsteiner SS	Malignancy + chemotherapy	15 sessions on biweekly basis IG=in a warm-up season of 3 min, treatment was given with frequencies between 9 Hz and 13 Hz in a flat place of the assessment lounge chair (0° height). A short time later, the position was changed beginning with 30° height at a recurrence of 14 Hz and expanding to a rise of 60°-90° at a recurrence of 18 Hz (3 min). From that point, there was a	Functional performance + sensory reflexes	WBV proved to be significant protocol with respect to fitness, sensory function and functional outcome.

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		change in position i.e, 90° rise (up-right position) beginning at a recurrence of 19 Hz and expanded to a recurrence of 23 Hz (3 min). At long last, a cool-down stage (9 min) followed with lower frequencies of 9 Hz to 13 Hz diminishing from 30° height to a lying position to shield patients from muscle irritation. CG= training of posture and transport movements including 21 separate exercises		

Table 5: Data Extraction Table

DISCUSSION

The patients having any kind of malignancy and going through chemotherapy faces debilitating effects like peripheral neuropathy, pain, fatigue, weakness making patient bed bound leading to loss of bone mineralization and restricting their functional activities. During this phase patient cannot do intensive exercises due to high risk factors and negative effects on patient health. But when the whole-body exercise is introduced in the regime of such patients it has been seen that it reduces the debilitating effects without any changes in the vitals of the patient i.e., without increase in the blood pressure which was checked before and after the whole-body vibration maneuver. A similar study reported the effect of vibration training in reducing bone turnover in post-menopausal women without cancer and our results are in accordance with it [21]. Moreover, when the patients were assessed after the particular duration on the basis of time up and go test (TUG), 3-minute walk test and other balance scales they proved to perform better than patients who were only having placebo effects or no treatment at all or they matched the effects of patients going through strenuous activities providing an alternative regime for those who cannot do strenuous activities due to certain health hazards. Hence, it is proposed that whole body vibration at specific frequency increases the blood flow of the patient which in turn decreases the rate of bone loss or muscular atrophy in bed ridden patients or those patients who are not mobile to reduce the debilitating effects. This is in contrast with the study which does not report the effect of whole-body vibration program on bones of young heathy adults [22]. Moreover, it leads to activation of the motor units leading to neuromuscular facilitation which helps in gaining better static and dynamic balance and overall functional activity of the patient. These all effects are same as one doing any resistive or cumbersome exercise which is not feasible in such patients. Not only in malignancy patients, but also in elderly and healthy patients it has been proven that whole body vibration proves to be a safer and important technique by which the better outcomes in terms of functional activities can be gained. Although much work is being done on the importance of whole-body vibration but still there is long way ahead to go. As, there is no literature found which studied the effect of whole-body vibration on specific malignancy or compared its effect on different type of malignancies to see what are the confounding factors which effect the prognosis of the patient. Moreover, we need to study what is the minimum frequency and duration of the whole-body vibration that is required to gain the set outcomes.

CONCLUSIONS

The whole-body vibration is an effective technique to recruit the motor units and increase neuromuscular activity in both health and unhealthy people. It is considered to be safest technique which is acquired when the patient cannot do strenuous activities due to other risk factors as in patients going through chemotherapy, it reduces the debilitating effects by improving the balance, reducing pain and improving the functional outcome of the patients.

Authors Contribution

Conceptualization: WS
Methodology: WS, WJ, UF
Formal analysis: IA, FA
Writing-review and editing: AAA, MA, AI

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

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