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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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The Future of Speech Therapy for Autism: Bridging Technology and Personalized Care

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Researchers have been working on autism since the 1980s [1]. Autism spectrum disorder (AUD) is a complex neurodevelopment condition that affects people's interaction with others, behavior, communication, and social interaction. Although autism may be a lifelong condition, appropriate support, services, and treatments can improve a person's symptoms and daily functioning. Individuals with autism often face challenges with speech and language development are prominent. Speech therapy (ST) plays a role in gaining control over verbal communication. An effective speech therapy can enhance the quality of life by addressing communication difficulties. Traditionally, the treatment of autism has a multidisciplinary approach that aims to address the diverse needs of individuals on the spectrum. Advancements in technology are revolutionizing the field by offering various possibilities for personalized care and improved outcomes. Healthcare professionals diagnose autism by assessing a person's development patterns and behaviors. Currently, speech therapy is delivered through face-to-face interactions with a trained therapist. Because parents of autistic children consistently identify language and social communication skills as a top priority. This approach has limitations, like scheduling conflicts, limited access to geographical constraints, and specialized care [2].

Telepractice platforms and virtual reality systems (VR), offer novel opportunities for accessible, personalized, and engaging therapy experiences. Telepractice is an online therapy service via technology-based platforms that allows long-distance interventions, breaking geographical barriers and expanding access to specialized care. Specifically, telepractice capitalized on communication practices such as video conferencing, and data tracking tools to facilitate effective communications and reduce barriers like distance. It is a very effective and low-cost method for conducting and completing online sessions for individuals with autism spectrum disorder [3].

The use of mobile technology in various countries become a necessity in the lives of people and also makes it a potential medium of intervention for people diagnosed with autism. It also enhances social skills, language development, and communication abilities. Virtual reality is an essential tool for healthcare intervention, offering realistic scenarios for practicing communication strategies and social interaction. Virtual reality interventions can lead to more stable and faster communication skills over time [4].

Advancements in artificial intelligence has enabled therapists to analyze data and identify patterns to meet the unique needs of each individual with autism. Technology is poised to facilitate collaboration and communication among individuals, and promote consistency across various settings. Researchers are involved in creating and training robots to interact with autistic children. We can empower individuals with autism to reach their full communication potential with the help of these latest technologies.

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Original Article

Prevalence of Burnout Syndrome among Physical Therapy House Officers

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ABSTRACT

Burnout syndrome is a psychological syndrome that is caused by inter-personnel stressors related to prolonged and hectic working hours in a hospital setting. It is overwhelming exhaustion feelings of cynicism, detachment from the job, and lack of accomplishment. **Objective:** To find the prevalence of burnout syndrome in physical therapy house officers working in the hospitals of Rawalpindi and Islamabad. **Methods:** The selection of participants was done by the purposive method of sampling and data collection from the 161 included participants was done by using the Maslach Burnout Inventory-Human Services Survey. The analysis of data were done by using IBM Statistics SPSS version 22.0. **Results:** The means and standard deviation for the three components of burnout were found to be 25.09 ± 9.56 for Emotional Exhaustion (EE), 10.093 ± 5.93 for Depersonalization (DP), and 31.248 ± 9.45 for Personal Accomplishment (PA). The mean values fall in the range of moderate level for Emotional Exhaustion (EE), moderate level for Depersonalization (DP), and low level for Personal Accomplishment (PA). Overall, an average of moderate to high levels of burnout was found in the included participants. **Conclusions:** It is concluded that physical therapists working in Rawalpindi and Islamabad are at high risk of developing burnout because of hectic routines and because of the reason that they are not being paid for their work.

INTRODUCTION

For the first time, burnout syndrome was described in 1974 by the famous scientist Herbert Freudenberg, and observed in healthcare workers characterized by multiple physical and psychological disorders. Burnout syndrome is overwhelming exhaustion feelings of cynicism, detachment from the job, and lack of accomplishment [1]. A detailed investigation was made by two scientists named Maslach and Jackson in 1993 [2].There is potential to recognize burnout syndrome as an occupational illness in 39% of European countries, and between 2005 and 2015, 738 participants reported having burnout syndrome in Denmark [3].The incidence of burnout among medical practitioners in Asian nations ranges from 21.3% to 92.2% on average [4]. Healthcare workers in Pakistan have high levels of burnout, moderate levels of occupational depression, and mild anxiety [5]. Burnout syndrome in physiotherapy was first studied by Wolfe who declared that physiotherapists were not spared from this syndrome [6]. The Maslach Burnout Inventory test results for physiotherapists from Spain also reveal a significant level (65.23) of burnout syndrome [7]. It is a psychological syndrome that is caused by inter-personnel stressors related to prolonged and hectic working hours in a hospital setting. The dimension of burnout syndrome given by Maslach is exhaustion (depletion of physical and emotional sources), asense of inefficacy (the feeling of incapability, lack of accomplishment, and abundance in work), and cynicism (detachment and backing off from the job-related aspects) which effect work in a bad manner [1]. Among healthcare providers burnout syndrome is a prevailing

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illness because of the increasing workload in these professions. Almost 10-70% of nurses, 30-50% of physicians, physician assistants, pharmacists, and nursing practitioners had burnout syndrome [8]. Burnout is mainly caused by emotional fatigue and physical exhaustion because of a shortage of staff in highly engaged hospital settings or other working areas [9]. Time pressure is also a crucial factor in getting burnout syndrome [6]. Victims of this distress highlight negative aspects instead of positive aspects of their work and also the low prognosis of the patient [2]. Therapists who are working for more than 15 years have more incidence of burnout syndrome however job satisfaction reduces the probability of getting burnout in physical therapists and other health care workers [9]. The Signs and symptoms of burnout syndrome get severe from time to time. Some of the basic as well as important symptoms initially identified in healthcare workersinclude loss of energy, a decreased capability to do work, inefficiency, and a lossof interest in goal orientation [9]. Few therapies are recognized as effective for treating burnout syndrome.These therapies include Psychotherapy, Cognitive therapy, Phototherapy, Physiotherapy, Adjuvant therapy, Pharmacology therapy and Complementary treatments like body-mind therapy or music therapy. Relaxation therapy, Multi-modal therapy, Meditation, and the use of psychotropic drugs e.g. antidepressants are also recognized as management procedures for burnout [10]. Physical therapists and other health care professionals need to be physically and psychologically well and fit to perform health-related duties effectively and efficiently but as burnout syndrome is prevalent among physical therapists, their duties and job performance may be compromised [11]. Due to the symptoms of BOS physiotherapists questioned their ability to do work and also questioned the choice of their career because of limited workload ability [12]. As house officers in any profession are in the beginning stage of their professional careers, the question of burnout and profession-related stress also originate among these practitioners. House officers of physical therapists are practitioners who provide a bulk of direct medical care for patients and are found to face a high level of job stress that affects their job performance in hospital settings [11]. As they extensively worked with patients in the physical therapy department, there may be a high risk of burnout syndrome in these practitioners. Burnout syndrome has been considered as one of the major occupational fortuity in physiotherapists and none of the previous studies analyzed its prevalence in physical therapy house officers who are not being paid for their work [12].

This study has aimed to find out the level and prevalence of burnout among house officers of physical therapy in an attempt to fulfill the gap. Our cross-sectional study is conducted to provide evidence for this prevailing syndrome as well as recommendations for future studies.

METHODS

This was a cross-sectional study, a research design in which we collected data from different individuals at a single point at a time. The study was conducted between February and July 2023 and the data were gathered through online Google forms and Social media from hospital settings of Rawalpindi/Islamabad, and directly from the physiotherapy department of the National Institute of Rehabilitation Medicine (NIRM) Islamabad after the approval from the NIRM hospital and the institutional ethical committee. Informed consent from the participants was also obtained.The Non-probability Purposive sampling technique was used for the collection of data for this study. Those participants were included who met inclusion and exclusion criteria and were available at the time of the conduction of the research.The sample size for the study was estimated to be 159 participants calculated by using the Epitool-epidemiological calculator [13]. The reference study used for sample size calculation was the study of Barone L et al., 2022 [14]. The Participants who were working as physiotherapy house officers or interns in hospitals of twin cities (Rawalpindi and Islamabad) and who were doing their house job or internship unpaid were included in the study. Those subjects who were above 35, had a chronic illness, or maintained their education in addition to their job were excluded. Data collection utilized the Maslach Burnout Inventory (MBI) questionnaire, complemented by additional demographic inquiries. The MBI comprises (22 items) divided into three sections: emotional exhaustion (9 items), depersonalization (5 items), and personal achievement (8 items) [15]. The MBI is a reliable tool for assessing burnout, particularly in professions involving interpersonal interactions [16]. Supplementary questions covered demographic variables such as age, gender, marital status, residence, duration of house job, and daily working hours. Data were analyzed using the SPSS software version 22. Descriptive statistics of gender, age, length of work of house officers, and working hours per day were made and presented in (Table 1). The analysis of burnout in the participants was made by using means and standard deviation of the 3 components of burnout and an overall mean score and standard deviation of MBI. The result is presented in tabulated form (Table 2). The results also reported the percentiles of participants who fell in moderate, low or high scores of Emotional Exhaustion (EE), Depersonalisation (DP) and Personal Accomplishment (PA) (Table 3). The interpretation of the result findings was made by criteria of low, moderate, or high level given by Maslach. High scores in emotional exhaustion (>30) and

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depersonalization (>12) denote high burnout, while a low score in personal achievement (<33) indicates burnout. However, low scores in emotional exhaustion (<17) and depersonalisation (<5), and high scores in personal accomplishment (>40) denote low levels of burnout. The values between high and low scores indicate moderate levels of burnout [15].

RESULTS

In this cross-sectional study, 168 participants were initially enrolled and assessed using the Maslach Burnout Inventory (MBI) Human Services scale. Following exclusions, 161 participants remained. A majority (64%) were aged 20-25 and all were registered house officers in Rawalpindi and Islamabad hospitals. Gender distribution showed 73% females and 26% males. Work duration revealed 79.5% of subjects working 5-10 hours/day, 6.8% over 10 hours/day, and 71.4% working 1-6 months as house officers (Table 1).

Table 1: Demographics of Study participants

Variables	Descriptions	N (%)
Gender	Male	42 (26.1)
	Female	119 (73.9)
Age (Years)	20-25	103 (64.0)
	26-30	58 (36.0)
Working Hours Per Day	Less Than 5 Hours	22 (13.7)
	5 to 10 Hours	128 (79.5)
	More Than 10 Hours	11 (6.8)
Length of Time for Working as a House Officer	Less Than 1 Month	16 (9.9)
	1 to 6 Months	115 (71.4)
	More Than 6 Months	30 (18.6)

The burnout questionnaire comprised 22 questions, divided into emotional exhaustion, depersonalization, and personal accomplishment. Table 2 displays descriptive statistics for all factors and the overall MBI score. Emotional exhaustion had a mean of 25 (SD = 9.56, range 0-49), depersonalization had a mean of 10 (SD = 5.93, range 0-26), and personal accomplishment had a mean of 31.2 (SD = 9.45, range 3-48). The overall MBI scale mean was 66.4 (SD = 17, range 13-111)(Table 2).

Table 2: Descriptive Statistics: Score of Burnout in Terms of Mean and Standard Deviation

Variables	Emotional Exhaustion	Depersonal-ization	Personal Accomplishment	Maslach Burnout Inventory (MBI)
N	161	161	161	161
Mean ± SD	25.09 ± 9.56	10.09 ± 5.93	31.25 ± 9.45	66.43 ± 17.73
Minimum	0	0	3	13
Maximum	49	26	48	111

In summary, 35.71% of physical therapy house officers reported high burnout (EE+DP), with 43.48% reporting moderate and 20.80% reporting low overall burnout (Table 3). For emotional exhaustion, 31.60% reported high burnout, 47.20% moderate, and 21.12% reported low levels. Regarding depersonalization, 39.75% reported high burnout, 39.75% moderate and 20.49% low levels of burnout. Additionally, on the personal accomplishment sub-scale, 55.9% reported high burnout (low PA score), 22.98% moderate, and 21.12% low burnout (high PA score).Burnout levels were analyzed using IBM SPSS v22, presenting means, standard deviations, and percentages of low, moderate, and high burnout across MBI subscales (Table 3).

Table 2: Percentiles of Level of Burnout on MBI Sub-Scales

Level of Burnout on MBI Sub-Scales	Emotional Exhaustion	Depersonalisation	Personal Accomplishment	Combined (Emotional Exhaustion + Depersonalisation)
	N (%)			
High Level of Burnout	51 (31.60%)	64 (39.75%)	90 (55.90%)	115 (35.71%)
Moderate Level of Burnout	76 (47.20%)	64 (39.75%)	37 (22.98%)	140 (43.48%)
Low Level of Burnout	34 (21.12%)	33 (20.49%)	34 (21.12%)	67 (20.80%)

DISCUSSION

This cross-sectional study aimed to determine the prevalence of burnout by using the Maslach Burnout Inventory scale which consists of three parts that are emotional exhaustion, depersonalization, and personal accomplishment.The individuals in current study had an average of low levels of personal accomplishment, moderate levels of depersonalization, and moderate levels of emotional tiredness (Table 2). Personal accomplishment and burnout are inversely correlated, according to the MBI scale, therefore a low degree indicates an averagely high amount of burnout in individuals. Moreover; this study reported an overall (EE+DP) high level of burnout in 35.71%, a moderate level in 43.48%, and a low level in 20.80% of the included participants. The results of this study show that among the physical therapy house officers employed in Rawalpindi and Islamabad, burnout has moderate to high prevalence. Since most physiotherapy house officers are between the ages of 20 and 25 (Table 1), a prior study indicated that young professionals in the healthcare industry are more likely than other age groups to experience emotional exhaustion and higher levels of depersonalization [17]. This finding supports the findings of currentstudy. Some of the results of numerous earlier investigations support our conclusions, but others don't. In contrast to current study, which found an overall moderate level of burnout in 43.48% of the sampled population, a study in Peshawaron the prevalence of burnout in physical therapists shows an overall low level in the majority of participants (37.6%) [18]. In a similar vein, a study conducted in Cyprus on the prevalence of burnout in physical therapists found that subjects experienced low to moderate levels of burnout, with only one-fifth of

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participants experiencing high levels [19]. It also found that 23% of participants had high levels of PA, 17.4% had high levels of DP, and 8% had high levels of EE. However, in current study, the majority of participants (43.48%) reported having moderate levels of overall burnout. In contrast to current study, which found a higher risk of burnout in subjects for DP and EE, the level of personal accomplishment in this study is consistent with our findings. Furthermore, an investigation was carried out in the United States of America to determine the correlation between physical therapists' years of uninterrupted practice and burnout. The study found that physical therapists experienced only extremely low levels of overall burnout and moderate levels of emotional exhaustion [20]. The degree of emotional tiredness is consistent with current study, but the results of this study do not corroborate the high prevalence of burnout in current study. Another study in Poland discovered that physiotherapists who had worked for five to fifteen years did not experience burnout and that burnout increased with more years of experience [21]. Additionally, this does not match with what current study found.On the other hand,a research of Saudi Arabian respiratory therapists revealed a modest degree of depersonalization and personal accomplishment along with a significant degree of emotional weariness, with mean scores of 31.97, 11.39, and 31.58, respectively [22]. Additionally, a comparable study conducted on Saudi Arabian physical therapists found that the patients' overall level of burnout ranged from mild to high [23]. This study's mean depersonalization score is 10.6, which is the same as current study. These two research significantly enhanced the findings. Comparably, the Latavia study that looked at the prevalence of burnout in physical therapists showed mean values for emotional weariness, depersonalization, and personal accomplishment of 24.52, 7.3, and 38.32, respectively [14]. This study found that participants had an average of moderate levels of burnout overall, which is very consistent with current study's findings that participants had moderate to high levels of burnout overall. To find out how often burnout is and how it relates to demographics, another study was carried out in Brazil [24]. In this study, the majority of participants (43.8%) reported feeling moderately emotionally exhausted, 50% reported feeling moderately depersonalized, and 70.8% reported feeling highly accomplished on a personal level. The results of current study are significantly strengthened by the EE and DP scores of our investigation.Additionally, a study on the frequency of burnout syndrome in Spain conducted in the Extremadura region of Spain found that individuals had moderate to high levels of burnout [7]. The study's total mean score for burnout was 65.23, with the mean scores for EE, DP, and PA being 20.2, 7.45, and 37.7, respectively. This study's outcome substantially reinforces and validates the conclusions we have made thus far. Another study that looked at 6,500 APTA members who practice physical therapy found that 13% of individuals had burnout and 29% had significant levels of EE. On the other hand, according to our research, 35.71% of PT house officers with an overall score of 35.71% and a high degree of EE had considerable burnout (31.6%). This outcome also lends some credence to over-research [25]. This study may contain contradictions from earlier research due to differences in inclusion criteria, study settings, and opportunities in the workplace. For example, this study found that burnout syndrome is more likely to develop in recent graduates working as unpaid house officers in physical therapy than in other types of workers. It will take more research on this high-prevalence syndrome among house officers to identify risk factors, coping mechanisms, and efficient management techniques. To avoid stress and overworking, which can result in burnout, it is advised that physical therapy professionals-specifically, house officers-should not be overworked and that staff members should be in sync with patient flow. Prevention of this syndrome is crucial in clinical settings by making the working environment better.

CONCLUSIONS

Burnout is a psychological condition associated with the stress brought on by demanding schedules, extreme fatigue, and a sense of helplessness at work. For workers in the medical field and other fields to be in better health, early detection of burnout and good management of it are critical. The results of this study show that burnout among physical therapy house officers ranges from a moderate to high overall score (EE+DP), with 43.48% of included participants reporting a moderate level of burnout overall and 55.9% reporting a high level of burnout related to personal success. The study is beneficial to identify how often burnout occurs in healthcare settings, which will enhance the productivity of professionals working for an organization.

Authors Contribution

Conceptualization: KN, SB
Methodology: KN, SB, RRA, MFA
Formal analysis: MFA
Writing, review and editing: MFA

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

Conflicts of Interest

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Original Article

Frequency of Bruxism among Mayofascial Temporomandibular Pain Disorder Patients

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ABSTRACT

The connection between bruxism and temporomandibular disorders is complex and not yet well understood. Bruxism is a disorder marked by recurrent jaw movements that result in teeth clenching or grinding. It is frequently regarded as a significant risk factor for temporomandibular problems (TMD). **Objective:** To determine the frequency of bruxism among myofascial pain disorder in temporomandibular joint patients. **Methods:** A non-probability convenient sampling strategy was used to conduct a descriptive cross-sectional study with a sample size of 179 patients. Questionnaire was based upon the diagnostic criteria of American Academy of Sleep Medicine for bruxism and data were collected from Lahore Medical and Dental College and Ghurki Teaching Trust Hospital Lahore. **Results:** Out of the 179 patients 94 (52.5%) reported symptoms of jaw joint noise and the frequency of bruxism in the participants was 106 (59.2%). **Conclusion:** The study concluded that bruxism is more frequent in myofascial pain disorder in temporomandibular joint patients.

INTRODUCTION

Temporomandibular Joint is complex synovial joint of condylar variety that consists of squamous portion of the temporal bone, the articular disc, joint capsule and mandible. Strengthening of joint is provided by capsule, ligaments, synovial membrane and muscles of mastication. Any problem in this complex structure causes temporomandibular disorders [1]. Temporomandibular joint disorder (TMD) is define as any change or variations in the temporomandibular joint, muscles of mastication and related structures. TMDs types involves myofascial pain , disc displacement and neck disability and multiple risk factors that include trauma ,headache, stress, posture instability, bruxism, dental problems ,excessive chewing ,open mouth breathing and muscles of mastication problems that can cause TMDs. According to recent study the most common form of temporomandibular disorder that reported was myofascial pain in jaw muscles. According to survey data, the majority of general dentists and TMD experts think that bruxism has a major part in the aetiology of TMDs [2]. This myofascial pain disorder syndrome was distinguished from another type of temporomandibular joint (TMJ) dysfunction, known as internal derangement, characterized by displacement of the TMJ disc, disc-condyle relationship disturbances, or alterations in the shape of the condyle, which could be identified through clinical or radiological examination. This classification proposed by Laskin was influential in the field of TMJ disorders and helped differentiate between

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different etiologies of TMJ pain and dysfunction. The previously listed common symptoms were included in the myofascial pain disorder criteria, with the exception that pain had to always be in one side. Two other requirements should also be fulfilled: (a) lack of clinical or radiological evidence of organic alterations in the temporomandibular joint; and (b) when the temporomandibular joint is palpated in the external auditory meatus, there is no discomfort there [3]. Bruxism is a disorder marked by recurrent jaw movements that result in teeth clenching or grinding. Bruxism is main etiological factor of temporomandibular disorders and routinely present in general population causes TMJ pain [4]. It is mostly related to stress [5]. Sleep bruxism is the clenching of teeth during night .Its clinical signs are abnormal tooth wear and grinding of teeth during sleep ,second is muscle of mastication pain in the morning and third is jaw locking upon awakening. According to dentists about 40% self-reporting sleep bruxism mostly occurs in people with painful TMDs [6]. Sleep bruxism is difficult to identify and have been associated with TMDs and other musculoskeletal conditions .The etiology of TMDs and Bruxism is still not clearly understood [7]. When sleep bruxism associated with TMDs it will increase the risk of headache and migraine [8]. Prevalence of TMDs associated with bruxism in overall sample was calculated according to RDC/TMD diagnosis criteria [9]. In another study the grinding of teeth or bruxism was highly prevalent TMD symptom (35.6%), joint noise (33.4%) and locked jaw (10.6%). TMD and its risk factors affects the approximately 33% of the population [10, 11]. Treatment of TMJ pain involves medications, therapeutics treatment, acupuncture, splints and physiotherapy techniques include manual therapy, TENS, massage, mobility exercises. A study was conducted that end up with the conclusion that the mobilization techniques and manual therapy have a long term effect on TMJ patients. A notable reduction in pain and improvement in restricted ROMs seen [12].

This study was conducted to estimate the frequency of bruxism among myofascial pain disorder in temporomandibular joint patients and to provide help to clinical professionals to focus on prevention and early treatment of pathological effects of bruxism.

METHODS

This descriptive cross-sectional study was conducted among 179 patients of myofascial pain of temporomandibular joint disorder from Ghurki Trust and Teaching Hospital (GTTH), Lahore, Pakistan in six-month duration after the approval from Ethical Review Committee of Lahore College of Physical Therapy, LMDC. Sample size was calculated by World Health Organization (WHO) sample size calculator with 0.75% prevalence [13]. Patients who met the diagnostic criteria were accepted in the study. The diagnosis of bruxism was based on the diagnostic criteria of the American Academy of Sleep Medicine reporting tooth grinding or clenching in combination with at least one of the following abnormal tooth wear, jaw joint noise with bruxism and jaw muscle discomfort. Questions were asked about the TMJ noise and tooth grinding. The nonprobability convenient sampling strategy was utilized. The inclusion criteria of patients for both genders were temporomandibular joint patients, 20 - 35 years of age, with complain of noise in jaw joint. Patients were excluded with dental problems, abnormal tooth wear, braces, stress, fatigue, anxiety and common health problems [13]. Data were compiled and analyzed using SPSS version 21.0. Variables were analyzed by descriptive statistics that provided frequency mean and standard deviation. A written consent form was provided to every patient and the purpose along with the nature of study was explained. The test was performed on every patient with the reassurance that their information was not disclosed and remained confidential.

RESULTS

The participant's mean age was 28.03 ± 4.505 years (table 1).

Table 1: Descriptive Statistics of Age of Population

Age of Population	N	Minimum	Maximum	Mean ± SD
	179	20.0	39.0	28.03 ± 4.505

Noise in temporomandibular joint 179 participants were included in study in which 94 (52.5%) came out with positive results and 85 (47.5%) with negative results (table 2).

Table 2: Noise in Temporomandibular Joint

Do You Feel Noise in Jaw Joint?	Frequency (%)
Positive/Yes	94 (52.5)
Negative/No	85 (47.5)

The frequency of bruxism both in males and females was 59.2% (table 3).

Table 3: Frequency of Bruxism in Both Males and Females

Bruxism	Frequency (%)
Positive/Yes	106 (59.2)
Negative/No	73 (40.8)

DISCUSSION

Bruxism is repetitive movement of jaw muscles that includes grinding and clenching of teeth. There are many problems that are responsible for developing TMJ problems. TMJ problems and its signs and symptoms are prevalent in almost 50% world's population [14]. One of the studies reported that 22.1% patients suffering from TMJ disorder with myofascial pain and clenching was their main problem. Out of all TMD symptoms the clenching was there main problem also reported TMD muscle pain in 26.1% patients [15]. TMJ problem had no significant association

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with malocclusion, gender and age. In this study patient were presented with TMJ pain jaw muscle discomfort and jaw joint noise. Another study investigated TMD symptoms and clenching was the most prevalent among the investigated students with a prevalence of about 35.6% which proved strongest relationship between bruxism and development of TMD [16]. Joint noise is second most common symptom of development of temporomandibular joint disorders Bruxism or clenching of teeth during daytime and night time are considered to have great impact on the etiopathogenesis of TMDs [17]. One of the studies showed that anxiety and bruxism were the risk factors for the development of the tension type headache associated with painful TMD [18]. Bruxism is a condition of great interest to researchers and clinicians of medicine and allied specialties. It is important that professionals take into account the signs and symptoms among young adults, especially the report of muscle pain in TMJ. In this study, temporomandibular joint patients were included that were diagnosed or known case of myofascial pain disorder. Patients reported with jaw muscle pain, discomfort and noise in jaw joint. One of the researches reported that grinding of teeth presents in 26-66% of patient diagnosed with TMDs Researches showed that prevalence of bruxism is 8 to 31.4% [17]. Clenching of teeth is associated with stress and self-reported muscle pain. A cross sectional study was done to investigate the association of bruxism and temporomandibular disorder pain in which females and males are both included age is between 16 to 24 years and patients was asked question about bruxism In the study its showed that the bruxism is positively associated with that TMJ pain [19]. In this study, 179 TMJ patients with myofascial pain both males and females were included. The exact mechanism of bruxism is still not well understood. Clenching of teeth is associated with stress and self-reported muscle pain. One of the researches reported that grinding of teeth presents in 26-66% of patient diagnosed with TMDs [20]. Based on the findings of the study, the frequency of bruxism among myofascial pain disorder in temporomandibular joint patients both in males and females was 59.2%.

CONCLUSIONS

The study concluded that the bruxism is more frequent in myofascial pain disorder in temporomandibular joint patients.

Authors Contribution

Conceptualization: AS
Methodology: AS
Formal analysis: YM
Writing, review and editing: AS, YM, HS, HMA

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 Neck, Shoulder and Back pain due to Heavy Backpacks among Private School Children of Islamabad: A Descriptive Survey

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ABSTRACT

School going children carry heavy back pack on daily basis. Heavy backpack can place extra pressure on shoulder, neck and back that can lead to pain in these regions of body. **Objective:** To explore the occurrence of neck, shoulder and back pain in school going children because of carrying heavy bag. **Methods:** A cross-sectional descriptive survey was conducted amongst school children of Islamabad from April 2023 to July 2023. A total of 274 school going children from various private schools of Islamabad region were the part of this study. School going children aging from 10 to 17 years of age of either gender with no history of musculoskeletal problems were included in the study. Data collection questionnaire incorporated standard Nordic Musculoskeletal disorder tool. Data were analyzed on SPSS version 25.0. **Results:** Children who carry back pack weight more than 10% showed more musculoskeletal symptoms in neck, shoulder and back. Results showed that frequency of musculoskeletal symptoms such as back pain was 171 (62.4%) and 97 (35.4%) students out of 100 who claimed no pain in back due to heavy backpack. In addition, the frequency of neck pain was 184 (67.2%) and 84 (30.7%) students who responded no neck pain due to heavy backpack. The frequency of shoulder pain was 86 (31.3%). **Conclusions:** Students with heavy back pack are more prone to develop musculoskeletal disorders including neck, shoulder and back pain.

INTRODUCTION

School going children carry heavy back pack on daily basis. Heavy backpack can place extra pressure on shoulder, neck and back that can lead to pain in these regions of body [1]. Secondly, this has a deleterious impact on the physical as well as psychological health. It increases their level of fatigue. It also reduces their performance in extracurricular activities [2]. The recommended ratio for bag to weight for school children was 10-15%. The musculoskeletal system and body posture is affected by the way of carrying backpacks for school [3]. Most of the children wear single strap of backpack that puts an extra stress on that particular side. It is due to unequal weight shifting on shoulders [4]. School students usually carry their bag by themselves so, it is significant for each student to carry their schoolbag conferring to their weight in order to avoid or minimize musculoskeletal pains [5]. Shoulder, neck and back pain are mild musculoskeletal conditions but recently it has turn out to be a foremost health problem and it also has enforced a negative effect on the person. It has a higher prevalence in comparison to other common health related problems like asthma, alcohol and drug abuse [6]. Children as well as teenagers of developing countries are more commonly affected by this. The data from various studies attributed that, the occurrence of neck pain in the overall population ranges from 0.4 to 86.8% in the worldwide [7]. According to study, neck or shoulder pain was stated 28.6% among 11–14 year-old children in Iran. Various studies highlighted that lifestyle patterns, multiple physical, psychological, and social factors along with improper sitting posture are the risk factors linked

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with neck and shoulder pain among students [6, 7]. For children it is well thought-out as a possible risk factor for health related problems during adulthood. Hence, understanding and properly detecting the pain as well as its effective management during childhood is crucial [7]. Carrying heavy back packs leads to musculoskeletal discomforts in schools children. Improper method of carrying Back pack leads to musculoskeletal disturbances and tiredness. Heavy back packs can change the anatomical position of body structures and making the body more prone to stress conditions [8]. Literature from previous researches is indicative of the fact that the weight carried by school children in the form of bag packs is higher than the standard range. Continual use of heavy school bags distress developing bones and can lead towards injuries due to stress [8]. These heavy school bags are responsible of changing the center of gravity of the child in towards the direction of weight. In order to compensate this, child typically tilts his body against the direction of load. For instance, if a child is wearing bag on sacrum he will precede his head and trunk in forward direction [9]. In past few years the weight of student's back pack has become a growing concern to the persons who have interest or are involved in educational aspect [10]. Heavy back packs aren't only the cause of back injuries, though that is the major concern, in fact they are also been found to be associated with causing neck pain as well as shoulder strain, headaches and a generalized sense of exhaustion [9]. According to children's health, heavy back packs can lead towards the upper and lower back pain along with neck strain. Bad posture, which is the resultant of backpack along with the back pain, can worsen the problem [11]. Roughly 90% of school going children carries backpacks to transport their belongings to and from school around the globe [12]. Prolonged use of carrying such heavy backpacks can be the source for musculoskeletal symptoms in school going children, along with added stress on rapidly growing spinal structures [13]. The American Occupational Therapy Association, The International Chiropractic Pediatric Association and The American Academy of Orthopedic Surgeons suggested that weight of backpacks must not be more than 10% of total body weight of the child while the American Physical Therapy Association suggested it to be 15% of total body's weight [14]. Number of problems that can be arise due to the use of heavy backpacks can lead towards the deformation in the natural curvature of the back causing muscle strain along with irritation to the rib cage leading to chronic back and neck pain, shoulder strain, generalized sense of exhaustion, ankle injuries, pain in the elbow, wrist and even in knee [15]. Musculoskeletal pain is a public health problem occurring in both males and females. It is considered as a common and costly occupational health problem in both developed and underdeveloped countries. It can cause significant personal discomfort due to pain. It also causes impairment of quality of life [16]. In this era everything is fast with new and innovative technologies, our life styles are becoming sedentary [16]. Children are significantly affected by this as their childhood outdoor games are replaced by smart phone games, causing them to become physically less active with weaker bodies and physical problems [17]. Among these physical problems, back pain is getting more common and therefore needs special attention by parents and community itself [17]. Previous available literature focused on either neck pain or shoulder pain never combined but our study specifically focused on neck, shoulder and back pain.

Current study aimed to highlight the occurrence of neck, shoulder and back pain in school going children carrying backpacks.

METHODS

A descriptive cross section study was carried out at University of Lahore Islamabad campus, after getting approval in April 08, 2023 from the Institutional Review Committee (IRC) / Ethical Review Board (ERB) of The University of Lahore, Islamabad Campus (IRB-IIUI-FAHS/DPT/1022-1137) with in the duration of 6 months from April 2023 to August 2023. Sample was calculated by Slovin's formula i.e. Confident interval (CI): 95% Margin of error (a-error): 0.05, $\mathbf{n} = \boldsymbol{N} / (\mathbf{1} + \mathcal{N}\boldsymbol{e}^{\mathbf{2}})$, where n= sample size, N= actual population, e= margin of error; N=1000, e=0.05; n =285. Non probability convenience sampling technique was used and data were collected using a semi-structured questionnaire that consisted of two parts, one was related to demographic features including age, gender, weight, height of the children and weight of the bag while second part incorporated standard Nordic Musculoskeletal disorder tool. This NMQ can be used as a structured interview or a questionnaire as it qualitative scale highlighting the areas of pain in past 12 and 07 months. It has no scoring since it is subjective or qualitative tool and all questions are answered in yes or no options. School going children aging from 10 to 17 years of age of either gender with no history of musculoskeletal problems were included in the study. Those having any history of trauma in past six months or having any diagnosed musculoskeletal disorder were excluded from the study. Analysis of data was done using SPSS version 25.0. All the categorical as well as qualitative variables were represented in frequency and percentages while continuous variables were presented in means and standard deviation.

RESULTS

Out of 285 samples, 11 were excluded based on inclusion criteria. Mean age of the sample size of 274 came out to be 13.32 ± 1.41 years. In table 1 the demographic

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characteristics and BMI distribution in a study population of 274 individuals. It includes age group distribution, with 51.8% falling in the 10-13 years category and 48.2% in the 14-17 years category. Gender distribution shows 52.9% male and 47.1% female participants. BMI distribution reveals that 73% of the population is underweight, 23% falls within the normal weight range, 2.9% is overweight, and 1.1% is obese.

Table 1: Demographic Characteristics and BMI Distribution among Study Population (n=274)

Demographic Characteristics	Category	N (%)
Age Group	10-13years	142 (51.8)
	14 -17years	132 (48.2)
Gender	Male	145 (52.9)
	Female	129 (47.1)
BMI	Underweight	200 (73)
	Normal Weight	63 (23)
	Overweight	8 (2.9)
	Obese	3 (1.1)

Table 2 presents the frequency and percentage distribution of body weight without backpacks among the study population. The weight categories include 21-30kg, 31-40kg, 41-50kg, 51-60kg, and 61-70kg. The majority of individuals (35.4%) fell into the weight category of 31-40kg, followed by 24.8% in the 41-50kg category. The smallest group (9.1%) had a body weight ranging from 61-70kg.

Table 2: The Frequency of Body Weight without Bag Packs

Weight Category		N (%)
Body Weights Without Back Pack	21-30kg	45 (16.4)
	31-40kg	97 (35.4)
	41-50kg	68 (24.8)
	51-60kg	39 (14.2)
	61-70kg	25 (09.1)

Table 3 displays the frequency and percentage distribution of body weight with backpacks among the study population. The weight categories include 21-30kg, 31-40kg, 41-50kg, 51-60kg, and 61-70kg. The largest proportion of individuals (46.3%) fell into the weight category of 31-40kg when carrying a backpack, followed by 21.5% in the 41-50kg category. The smallest group (4.3%) had a body weight ranging from 61-70kg while wearing a backpack.

Table 3: The Frequency of Body Weight with Bag Packs

Weight Category		N (%)
Body Weights Without Back Pack	21-30kg	35 (12.7)
	31-40kg	127 (46.3)
	41-50kg	59 (21.5)
	51-60kg	41 (14.9)
	61-70kg	12 (04.3)

Table 4 presents the mean values and standard deviations (S.D) for the weight of the backpack, weight of the child, and the bag-to-weight ratio within the study population. The mean weight of the backpack was 5.70 kg with a standard deviation of 3.18. The mean body weight of the children was 39.30 kg with a standard deviation of 9.81. The bag-to-weight ratio, calculated by dividing the bag weight by the body weight, had a mean value of 0.15 with a standard deviation of 0.09.

Table 4: Mean Weight of Bag Pack, Weight of Child and Bag to Weight Ratio

Items	Mean ± S.D
Bag weight in KG	5.70 ± 3.18
Body weight in KG	39.30 ± 9.81
Bag to weight ratio	0.15 ± 0.09

Figure 1 illustrates the frequency of neck pain reported by the study population over a period of 12 months. Out of the total study population, 182 children (67.2%) experienced neck pain. This figure provides a visual representation of the prevalence of neck pain within the study population, highlighting the significant proportion of children affected by this condition.

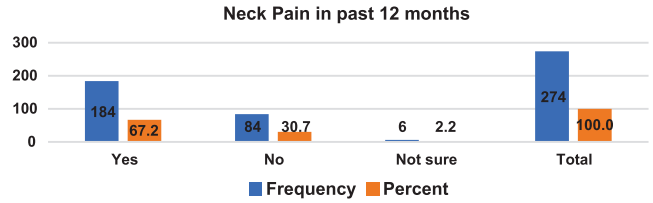

Figure 1: Frequency of Neck Pain in the Past 12 Months among Study Population

Figure 2 depicts the frequency of shoulder pain reported by the study population within the past 12 months. Among the study population, 86 individuals (31.3%) have experienced shoulder pain.

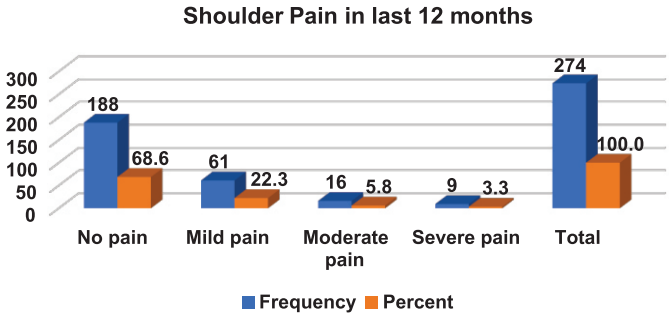

Figure 2: Frequency of Shoulder Pain in the Last 12 Months among Study Population

In figure 3 showing back pain in last 12 months among study population according to which 171 (62.4%) children experiences back pain.

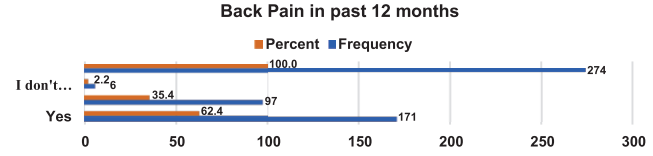

Figure 3: Frequency of Back Pain in the Past 12 Months among Study Population

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DISCUSSION

The school going children are the real assets of our nation. It is necessary to ensure the physical health status of school going children [5]. Heavy backpack is very common emerging problem among the students. That should not be overlooked by our families and schools [9]. The prevention of neck, shoulder and back pain is very important for the better performance in education as well as for the daily life activities in students [10]. The current study aims to explore the occurrence of neck, shoulder and back pain in school children of twin cities due to carrying heavy school bags. This study included age group of 10-17 and grades 5-10. Moreover, it focused the schools in the region of Rawalpindi/Islamabad. Including both genders males and females like previous studies [12]. Children who carry back pack weight more than 10% showed more musculoskeletal symptoms in neck, shoulder and back. Study conducted by Khan et al., in 2016 concluded that children who carry back pack of weight more than 10% showed more musculoskeletal symptoms in neck, shoulder and back [18]. In the current study the mean ± SD of bag to weight ratio is 0.15 ± 0.09 supporting of the results of current study. Results of the present study showed that frequency of back pain in past 12 months was 171 (62.4%). In addition, the frequency of neck pain was 184 (67.2%) among study population. While, the 188 students (68.6%) responded no shoulder pain and there were 61 students (22.3%) responded mild pain in shoulder. The 16 students (5.8%) were responded moderate pain due to heavy backpack. There were 9 students out of 274 (3.3%) responded severe pain in shoulder that affected their performance in education and daily life activities badly. Another study was conducted in Karachi by Mirza *et al.*, in 2020, that included school going children of age group 9-13 revealed that the musculoskeletal symptoms were neck pain (43.8%), shoulder pain (93.8%) and back pain (36.5%) [19]. Moreover, this current study also showed the major effects on neck, shoulder and back pain due to carrying heavy backpack among school children are prevalent. Study conducted by Chowdhury *et al.*, in 2018 in Lahore, included students of grade 5th to 8th. According to their results, musculoskeletal symptoms were neck pain (27.6%), shoulder pain (38.1%) and back pain (16.7%) [20]. While current study was conducted in Islamabad displayed the occurrence of back pain 171 (62.4%), neck pain 184 (67.2%) and shoulder pain (31.3%).

CONCLUSIONS

Current study concluded that students with heavy back pack are more prone to develop musculoskeletal disorders including neck, shoulder and back pain. This study is limited to the urban areas of Islamabad. It does not represent the musculoskeletal problems in rural areas of Rawalpindi/Islamabad. It is recommended that children should be given cabinets to keep their bags to prevent discomfort.

Authors Contribution

Conceptualization: SH
Methodology: P, UR, HB
Formal analysis: RA
Writing, review and editing: SH

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

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Practice and Barriers to Spirometry Usage among Healthcare Professionals in Karachi

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ABSTRACT

A spirometer is the most suitable technique for primary care because it is very convenient for healthcare professionals to use because it is very low cost, performs in a short time, and also it is a non-invasive technique patients can easily understand and perform. The usage of a spirometer is very beneficial and important to find out the stage and monitor the pulmonary conditions during performing therapies. **Objective:** To determine the knowledge, practice, and barriers regarding the usage of spirometry among healthcare professionals in Karachi. **Methods:** A cross-sectional survey was done from Nov 2023 to April 2024 in Karachi on healthcare professionals to explore the usage of spirometry among them. The sample size was 384 and the non-probability convenients sampling was used. Data were evaluated through a validated questionnaire and analization of data were done through SPSS version 23.0. **Results:** A total number of 384 research participants were included in this study. The results showed that knowledge related to spirometry usage was present in research participants around 319 (83.07%). The practice of spirometry by healthcare professionals was observed in 172 (58.9%) and the most common barrier observed in this study was the rate of unavailability of the equipment around 51 (13.28%) in the hospitals. **Conclusions:** It was concluded that the knowledge of spirometry was good among healthcare professionals but the practice was poor due to the unavailability of spirometry in the hospitals.

INTRODUCTION

The spirometer is the apparatus that is used to measure the capacity of the lungs for inhalation or exhalation of the air [1]. It is considered the best way to detect and diagnose a patient who suffers from chronic diseases of the lungs especially those patients who suffer from long-term obstruction of airflow [2]. A spirometer is the most suitable technique for primary care. because it is used for the measurement of the amount of air we breathe in and out of our lungs and also shows the blowing of the flow of air from our lungs towards the outside. It is very convenient for healthcare professionals to use because it is very low cost, performs in a short time, and also it is a non-invasive technique patients can easily understand and perform [3]. It is very helpful in diagnosing initial and prolonged respiratory issues or diseases. Most of the conditions of the lungs and surrounding structures can be used for the

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prevention of many diseases [4]. A study has shown that major pulmonary diseases can be easily managed when they can be diagnosed at an earlier stage and can be treated by physicians or respiratory experts. The detection of appropriate signs and symptoms of the condition is an essential part of finding better outcomes for treatment [5]. In some countries, due to low income, most of the services of X-ray imaging and endoscopic procedures are not available for the patients to diagnose the specific cause of the condition, and most of the specialists don't refer patients for radiographic assessment and spirometry in pulmonary conditions of patients [6]. The usage of a spirometer is very beneficial and important to find out the stage and monitor the pulmonary conditions during the process of management. Mostly spirometry is helpful for those patients who are planning for any type of surgery to assess the cardiopulmonary disease of a patient which can help in reducing the symptoms during or after the surgery [7]. Spirometry is used for screening and evaluation of issues related to the condition. of the people. The test of spirometry is widely used in the evaluation and management of a patient [8]. It depends on the country and its healthcare system that many healthcare professionals and consultants perform the spirometry test themselves, or otherwise, they only supervise the test, or in some clinical settings they only interpret the spirometry readings and results of the test [9]. In the U.S., it can be performed by healthcare professionals in which general practitioners and nurses are involved [10]. Compared to France, it can be performed by pulmonologists who are experts in this field after the approval of the registrar. Spirometry is a good and valuable piece of equipment, it requires the best and most well-trained trainer and the patient who easily understands the procedure and participates easily [11]. This can be performed by healthcare professionals which include general practitioners, physical therapists, pulmonologists, and nurses. They are well-trained staff for performing the spirometry on the patient [12].

This study aimed to determine the knowledge, practice, and barriers regarding the usage of spirometry in healthcare professionals.

METHODS

It was a cross-sectional study conducted from Nov 2023 to April 2024 in Karachi. The research participants were chosen through a non-probability convenient sampling. Healthcare professionals working in hospitals in seven districts of Karachi (East, West, South, North, Central, Malir, Korangi, Kemari) were recruited and a sample size of 384 was calculated through Raosoft.com software. According to the total number of healthcare professionals of Karachi and the confidence interval of 95%. In inclusion criteria, healthcare professionals like physicians, physical therapists, and nurses are those working in clinical settings with minimal experience of 1 year, age group between 20 years to more than 59 years. The exclusion criteria was students or interns working under supervision in hospital settings, and those who were not willing to participate in our study were excluded. In this study, a validated questionnaire was used which was already used by Desalu OO *et al.*, in the research done in 2009 in Nigeria [13]. This questionnaire comprises questions related to knowledge, practice, and barriers to the usage of spirometry among healthcare professionals. Consent was taken from the research participants before the collection of data. Data were analyzed by SPSS version 23.0 software. Through which frequencies and percentages of variables were calculated. The chi-square test was used to check the significance of the responses of research participants related to the knowledge, practice and barriers of spirometry usage among healthcare professionals at a p-value of <0.05.

RESULTS

A total number of 384 healthcare professionals were extracted from different hospitals in Karachi of which 67 (17.44%) were general physicians, 148 (38.54%) were Physical therapists, 169 (44.01%)were nurses and 203 (52.86%) were male respondents, and 181 (47.13%) females who were participating in this study. The demographics of the participants and the details regarding the spirometer are shown in table 1.

Table 1: Demographical Data of Study Participants

Demographical Data	Frequency (%)
Age	
20-29	87 (22.65%)
30-39	103 (26.82%)
40-49	81 (21.09%)
50-59	74 (19.27%)
>59	39 (10.15%)
Gender	
Male	203 (52.86%)
Female	181 (47.13%)
Years of Experience	
<5 Years	217 (56.51%)
>5 Years	167 (43.48%)
Hospital	
Government	74 (19.27%)
Semi-Government	113 (29.42%)
Private	197 (51.30 %)
Cases of Respiratory Issues in A Week	17 (4.42%)
Spirometer Availability in Setup	
Yes	249 (64.84%)
No	135 (35.15%)
Knowledge of Spirometer Interpretation	
Yes	319 (83.07%)

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No	65 (16.92%)
Healthcare Professionals	
Physicians	67 (17.44%)
Physical Therapists	148 (38.54%)
Nurses	169 (44.01%)

According to healthcare professionals, they face many barriers regarding the spirometer practice because it is depending on the private or public sector hospital. The rate of unavailability of the equipment was high about 51 (13.28%), lack of knowledge of how to use the spirometer was about 28 (7.29%), lack of time was about 42 (10.93%), the ratio of patient participation was about 29 (7.55%), and the spirometer is very expensive was about 37 (9.63%) as shown in figure 1.

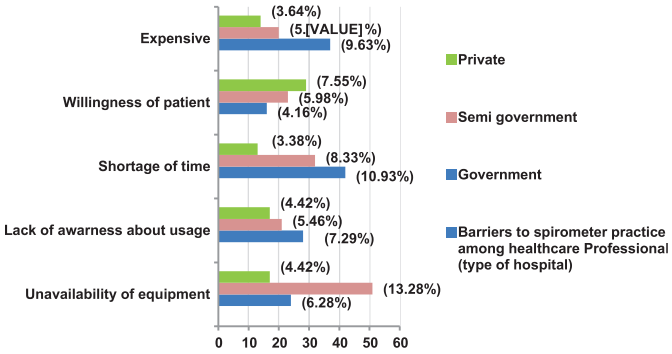

Figure 1: Barriers To Spirometer Practice Among Healthcare Professionals (Type of Hospital)

The response of questions related to the use of spirometry in their practice 172 (58.9%) responded yes that they used a spirometer sometimes. In the response to questions regarding monitoring the complaint of asthma by using the spirometer 94 (55.95%), participants responded never. When the questions related to the usage of a spirometer frequency to diagnose patients who suffered from COPD 62 (16.14%) responded to never. When questions regarding the pre-employment test through a spirometer 73 (51.40%) of the healthcare professionals replied sometimes that they used it. When the questions about the satisfaction level regarding the interpretation of the spirometer about 103 (56.90%) of the healthcare professionals responded yes that they were somewhat satisfied with their interpretations of the spirometer as shown in table 2.

Table 2: Questions Related To Spirometry

S No.	Questions (Spirometry Access & Knowledge)	Yes N (%)	No N (%)	Total
In your practice do you use the spirometer?				
1	Frequently	57 (19.52)	21 (22.82)	78 (20.31)
	Sometimes	172 (58.9)	44 (47.82)	216 (56.25)
	Rarely	38 (13.01)	15 (16.30)	53 (13.80)
	Never	25 (8.56)	12 (13.04)	37 (9.63)
To monitor the asthma you request the patient to use the spirometer.				
	Frequently	39 (23.21)	53 (24.53)	92 (23.95)
2	Once in a year	18 (10.71)	11 (5.09)	29 (7.55)
	Every follow up	17 (10.11)	29 (13.42)	46 (11.97)
	Never	94 (55.95)	123 (56.94)	217 (56.51)
To diagnose copd how frequently use the spirometer?				
3	Frequently	12 (10.08)	29 (10.94)	41 (10.67)
	Sometimes	22 (5.72)	67 (17.44)	89 (23.17)
	Rarely	23 (5.98)	38 (9.89)	61 (15.88)
	Never	62 (16.14)	131 (34.11)	193 (50.26)
Do you use the spirometer for pre-employment				
4	Frequently	18 (12.67)	29 (11.98)	47 (12.23)
	Sometimes	22 (15.49)	39 (16.11)	61 (15.88)
	Rarely	73 (51.40)	136 (56.19)	209 (54.42)
	Never	29 (20.42)	38 (15.70)	67 (17.44)
How much are you satisfied with interpreting the readings of the spirometer?				
5	Not Satisfied	29 (16.02)	42 (20.68)	71 (18.48)
	Somewhat Satisfied	103 (56.90)	129 (63.54)	232 (60.41)
	Satisfied	40 (22.09)	13 (6.40)	53 (13.80)
	Don't know	9 (4.97)	19 (9.35)	28 (7.29)

DISCUSSION

This study showed the majority of healthcare professionals i.e: 319 (83.07%) were aware of the role of spirometry in the diagnosis and management of respiratory issues however a study done in Nigeria reported, that utilization of spirometry was low and poorly practised by the healthcare professionals which was due to the unavailability of spirometry instrument in the hospitals and lack of reference from the primary physicians of patients [14]. Another study done in the USA shows similar results to Nigerians' study that the use of spirometry was poorly practiced by the doctors in their practice [15]. There are many barriers to the usage of spirometry out of three types of hospitals: government, semi-government, and private 42 (10.93%) of healthcare professionals thought the use of spirometer is limited in government hospitals due to lack of time. 51 (13.28%) thought unavailability of equipment and 29 (7.55%) of healthcare professionals thought that the measure barrier in the usage of spirometry is the unwillingness of patients. A study reported that, according to doctors spirometers also work as a preventive measure for lung diseases, especially for people whose work environment makes them susceptible to the diseases [16]. As spirometry is an instrument that is commonly used by post-surgical and ICU patients [17]. So, the results of our research showed the use of spirometry is sometimes used by 172 (58.9%) healthcare professionals. For the evaluation of asthmatic patients, the use of spirometry was never used by 94 (55.95%) of the research participants of our study. Although the study showed the role of spirometry in the evaluation process of lung parameters in patients before surgery [18]. Spirometry used by healthcare professionals for the diagnosis of COPD (Chronic Obstructive Pulmonary Disease) was frequently used by

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only 12 (10.08%) of the research participants of our study. These results may be due to the shortage of awareness sessions through workshops, training programs, and also during the studies between the period of learning of healthcare professionals medical colleges. The use of spirometry was poor in the USA and Nigeria [19]. The use of spirometry for the pre-employment test was rarely used by 73 (51.40%) of the research participants of our study. However, a study reported that attendance at workshops organized by the National Respiratory Society was low for the past five years so it is necessary to reduce the factors that cause the low attendance in workshops related to spirometry [20]. Another study revealed that knowledge regarding spirometry usage was increased through attending seminars and workshops [21]. The use of spirometry was not prioritized by the healthcare professionals because it does not give a return on investment and is unable to generate profits for the hospitals so they were not satisfied with use the of spirometry in daily practice [22]. Although it can determine the strong relationship between lung function and clinical outcomes in our study most common answer about the level of satisfaction among the healthcare professionals of our study regarding the usage of spirometry for patients was sometimes satisfied in 103 (56.90%) which showed the preference of spirometry was good in our Pakistan and it also provides better outcomes in post-surgical and lung disease patients.

CONCLUSIONS

It was concluded that most healthcare professionals know the benefits and usage of spirometry, and they practice the equipment sometimes in clinical settings but some barriers hinder the use of spirometers like: expenses, shortage of time, willingness of patients, lack of awareness regarding the usage, and unavailability of spirometry in the hospitals. We should address the barriers that limit the use of spirometry in clinical settings and take a step forward to increase the knowledge of healthcare professionals and the general public to enhance the knowledge related to the use and benefits of spirometry through the organization of seminars, workshops, and training sessions. These steps will enhance the quality of life of patients related to respiratory illnesses.

Authors Contribution

Conceptualization: SRB
Methodology: SRB
Formal analysis: SRB, ZSP
Writing-review and editing: ZSP, BMZ, SAA, AI, ARB

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

Conflicts of Interest

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Awareness, Attitude, Belief, and Motivation of Health Care Professionals towards Obstetrics and Gynecological Physical Therapy

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ABSTRACT

Physical therapy focuses on various health issues of women like: women with pregnancy, after delivery, pelvic floor dysfunction, uterine prolapse, polycystic ovary, and pelvic floor dysfunction was known as Gynecological physical therapy. Healthcare professionals should be aware of and motivate patients toward the significance of physical therapy in gynecological issues. **Objective:** To determine the awareness, attitude, belief and motivation of healthcare professionals of Karachi towards gynecological physical therapy. **Methods:** This was a cross-sectional survey-based study that was conducted from November-2023 to April- 2024, the study population was healthcare professionals from seven districts of Karachi and the sample size was 389, the sampling technique was non-probability purposive sampling. The validated questionnaire was used to evaluate the attitude, beliefs, and motivation of healthcare professionals towards gyne PT. The data were analyzed through SPSS version 23.0. **Results:** There were 389 healthcare professionals recruited from different districts of Karachi. The level of awareness among the research participants was 36.24%, the belief of research participants regarding the gynae physical therapy was good towards the effectiveness of treatment 44.21% believed that pelvic floor exercises were effective in gynecological problems, 39.33% were highly motivated towards the physical therapy treatment. However, 35.21% thought that the training in the gynecological field was limited and the referral system was thought to be limited by 19.28% of research participants. **Conclusions:** This study concluded the level of awareness and motivation was good enough among healthcare professionals of our study while there was a lack of referral systems and training programs available in this field of physical therapy.

INTRODUCTION

Women's health services provided by physical therapy were discovered in the clinical settings of obstetrics and gynecology [1]. The health services provided to the women undergoing childbirth, treatments, and guidance are needed in both antenatal and postnatal periods including both antenatal and postnatal classes, management of urinary incontinence, and post-operative care in patients who undergoing gynecological surgery [2]. According to the study, the prevalence of pelvic inflammatory disease in Pakistan is 12.8% although patients with this condition are not primarily referred for physical therapy service until the pharmacological treatment is limited and resisted and in this condition modality used by physical therapists i.e.: short wave diathermy is effective [3]. Gynecological physical therapy focused on various health issues of women like treatment of genital areas, women with pregnancy, after delivery, pelvic floor dysfunction, vaginal or pelvic pain, musculoskeletal issues related to antenatal and postnatal women, osteoporosis, rehabilitation after breast surgery, lymphedema treatment, menopausal

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women, young athletes prevention and other serious conditions that specifically affect the females and they need prevention, management through exercises and education related to the problems [4]. Physical therapists provide knowledge related to accurate posture, and strengthening of muscles of the pelvic floor region through various interventions used in physical therapy treatment [5]. Specialized physical therapists are required to deal the patients related to gynecological complications because this field needs mature and experienced physical therapists who can collect the all personal and useful information of women related to their private lives [6]. The knowledge of gynecologists regarding the role of physical therapists in gynecological health issues is a crucial part of the healthcare system which needs to be enhanced by the promotion of healthcare services offered by physical therapy treatment through workshops, training sessions, and hands-on practice sessions [7]. According to the study, physical therapy treatment is useful in increasing the conception rate of women having infertility issues [8]. Physical therapy is one of the fields that is useful in various issues despite this being neglected by the people due to the lack of awareness in Pakistan [9]. Moreover, rehabilitation medicine is also neglected in Asia and Africa due to the lack of referrals from doctors [10]. According to a study done in Pakistan, about 60 to 65% of gyne doctors have awareness regarding antenatal physical therapy while 69% have awareness regarding postnatal physical therapy services [11]. Another study revealed gynecologists have an awareness regarding the role of physical therapy in the treatment of gyne problems in their patients but they express their low concern towards it and take no bother for the reference of patients to the physical therapists [12]. Around the world, Obesity is the leading cause of increasing disease and death rates while women having gynecological issues along with obesity can cause serious illness and may lead to prolonged disability [13]. Being a physically active woman is a blessing to any female during their antenatal and postnatal periods but the obese women prone to have common issues of hyperlipidemia, carcinoma of the rectal region, infertility, menstrual dysfunction as well as Polycystic Ovaries (PCO) [14]. So, it is necessary to have a physically active status of health during the reproductive life of a women it will help to facilitate the natural process of fertility and mental stability.

The purpose of this study is to determine the level of awareness, attitude, belief, and motivation of healthcare professionals in Karachi towards gynecological physical therapy.

METHODS

It was a cross-sectional study conducted among the healthcare professionals of Karachi from November-2023 to April- 2024. Data were collected through online Google Forms. The sample size of this study was 389 which was calculated through sample size calculator by Raosoft. According to the population of healthcare professionals of Karachi. The non-probability purposive sampling was used. The inclusion criteria were both genders, healthcare professionals like consultants, doctors, physical therapists, and paramedical staff who were currently working in hospital setups of Karachi, the age between 20 to 55 years, and research participants having at least 1 year of working experience to 30 years. Those participants were excluded from our study who were not willing to participate in the study and who were working in academic setups. A validated questionnaire that was already used in the previous study in 2022 in which demographic information of research participants as well as questions related to awareness, attitude, motivation, and belief was included to evaluate the knowledge of healthcare professionals regarding gynecological Physical Therapy [15]. The data were analyzed through the SPSS version 23.0 software through which frequencies and percentages of different variables of research participants was determined.

RESULTS

There were 389 healthcare professionals recruited from Karachi. The demographic information of research participants comprising of: age, designation, years of experience, types of institute and seven districts were mentioned in table 1.

Table 1: Demographical Data of Study Participants

Variables	Frequency (%)
Age	
20-25	53 (13.62%)
26-30	76 (19.53%)
31-35	89 (22.87%)
36-40	68 (17.48%)
41-45	52 (13.36%)
46-50	39 (10.02%)
51-55	12 (3.08%)
Designation	
Physicians	48 (12.33%)
Doctors	91 (23.39%)
Physical Therapists	132 (33.93%)
Paramedical staff	118 (30.33%)
Years of Experience	
1-5	134 (34.44%)
6-10	105 (26.99%)
11-15	69 (17.73%)
16-20	38 (9.76%)
21-25	24 (6.16%)
26-30	19 (4.88%)
Type of Institute	
Government	76 (19.53%)

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Semi government	105 (26.99%)
Private	208 (53.47%)
District	
East	61 (15.68%)
West	59 (15.16%)
South	38 (9.76%)
North	72 (18.50%)
Central	90 (23.13%)
Malir	21 (5.39%)
Korangi	36 (9.25%)
Kemari	12 (3.08%)

When we asked questions related to motivation how much they were motivated to practice gynecological physical therapy they answered 24.93% strongly agree, 39.33% agree, 15.16% neutral, 8.99% disagree, 6.94% disagree, and 4.62% responded I don't know. In response to the question related to the awareness about gynecological physical therapy treatment, 28.79% strongly agree, 36.24% agree, 21.33% neutral, 7.45% disagree, 3.59% strongly disagree, and 2.57% responded I don't know. Regarding questions related to education and training, 35.21% strongly agree, 22.62% agree, 16.45% were neutral, 12.08% disagree, 7.96% strongly disagree, and 5.65% said I don't know. Responded there were not enough educational programs or workshops available in this domain. The reaction of the healthcare professionals regarding the belief that pelvic floor treatment was not effective in POP (Pelvic Organ Prolapse) and UI (Urinary Incontinence) 6.94% strongly agree, 8.74% agree, 5.91% neutral, 44.21% disagree, 28.79% strongly disagree, and 5.39% were answered I don't know. Questions related to the employment status that the referral system was limited in this domain 19.28% strongly agree, 21.59% agree, 14.65% neutral, 27.50% disagree, 15.16% strongly disagree, and 1.79% responded I don't know as shown in table 2.

Table 2: Awareness, Attitude, Beliefs and Motivation of Healthcare Care Professionals towards Gynecological Patient

Statement	Strongly Agree N (%)	Agree N (%)	Neutral N (%)	Disagree N (%)	Strongly Disagree N (%)	I Don't Know N (%)
Motivation						
I am Motivated to Practice Gynecological Physical Therapy	97 (24.93%)	153 (39.33%)	59 (15.16%)	35 (8.99%)	27 (6.94%)	18 (4.62%)
Awareness						
Gynecological PT includes POP, UI, Pelvic Pain, Hysterectomy, Antenatal, and Postnatal Care	112 (28.79%)	141 (36.24%)	83 (21.33%)	29 (7.45%)	14 (3.59%)	10 (2.57%)
PT can be Effective in 50-70% of Patients	82 (21.07%)	98 (25.19%)	64 (16.45%)	94 (24.16%)	39 (10.02%)	12 (3.08%)
PT can be Effective in 50-70% of Patients	104 (26.73%)	85 (21.85%)	76 (19.53%)	69 (17.73%)	52 (13.36%)	3 (0.77%)
Education and Training						
During my Undergraduate Study, there was Insufficient Exposure and Teaching to Gynecological PT	123 (31.63%)	103 (26.47%)	72 (18.50%)	53 (13.62%)	30 (7.71%)	8 (2.05%)
There are not Enough Educational Programs or Workshops Available [Master or Doctoral]	137 (35.21%)	88 (22.62%)	64 (16.45%)	47 (12.08%)	31 (7.96%)	22 (5.65%)
Attitudes and Beliefs						
Religiously it is not Acceptable to Perform Gynecological PT	41 (10.53%)	19 (4.88%)	22 (5.65%)	191 (49.10%)	103 (26.47%)	13 (3.34%)
I Believe that Pelvic Floor Physiotherapy is not Effective In Treating POP and UI	27 (6.94%)	34 (8.74%)	23 (5.91%)	172 (44.21%)	112 (28.79%)	21 (5.39%)
Employment and Career						
There are not Many Job Offers to Practice	87 (22.36%)	134 (34.44%)	86 (22.10%)	57 (14.65%)	16 (4.11%)	9 (2.31%)
There is Limited Referral by Physicians for Gynecological PT	75 (19.28%)	84 (21.59%)	57 (14.65%)	107 (27.50%)	59 (15.16%)	7 (1.79%)

DISCUSSION

A common belief was that knowledge about healthcare facilities was mainly in private hospitals but in Pakistan where people used to visit government hospitals for the treatment of gynecology, the enhancement in the awareness and availability of healthcare services advised by physical therapists was a very crucial aspect of every government hospital [16]. In the present study, data were collected from healthcare professionals from all three sectors of hospitals: 19.53% from a government hospital, 26.99% from semi-government hospitals, and 53.47% from private hospitals. Previous literature focuses on the importance of physical therapy treatments in the field of gynae and obs [17]. While the attitude of healthcare professionals was not shown in any of the literature from Pakistan. The main objective of this research was to find out the awareness, attitude, belief and motivation of healthcare professionals toward gynecological physical therapy it was observed that: (64.26%) healthcare professionals agree that they were motivated towards the physical therapy practice in gynae patients. The response of healthcare professionals towards the question related to the awareness of different gynecological conditions that

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can be treated by physical therapy treatment (65.03%) of participants agreed that they were aware and they thought 98 (25.19%) of physical therapy treatment can be effective in 50 to 70% of cases. However, a misconception was seen in our study among the research participants that physical therapy treatment only treats gynae patients with Kegel exercises. A study revealed, that their research participants had less experience in gynecological physical therapy and most of their participants belonged to the general medical field therefore they have lack of awareness related to gynecological physical therapy as compared to others [18]. A study reported that the majority of research participants were seniors and they belonged to the gynecological field and they responded against the question related to the exposure and opportunities training of gynecological therapy was deficient and not easily available to all healthcare professionals as compared to this from study the lack of training in gynecological treatment during undergraduate programs was observed about 123 (31.63%) responded strongly agreed in addition to this there was not enough training or seminars available that can increase the level of education in public and healthcare professionals related gynecological physical therapy the response of this research participants was 137(35.21%) strongly agreed in this regards [19]. A study reported the attitude and practice of gynae doctors towards physical therapy treatment that they have better knowledge than the senior registrars that physiotherapy and they know that it can be effective 98.5% in postnatal patients, 82.1% in antenatal patients, 98.5% in uterine prolapse patients, 70.1% in post-hysterectomy patients, 32.8% in pelvic inflammatory conditions, 7.5% in cervical incompetence 56.7% in other gynecological conditions in comparison to this in this study the attitude and belief of healthcare professionals concerning the non-acceptance of gynecological physical therapy treatment in Islam was: 191(49.10%), while 27(6.94%) healthcare professionals were fully aware of the effectiveness of pelvic floor exercises in the treatment of uterine prolapse and pelvic organ prolapse [20]. The referral system of gynecological physical therapy was shown to be almost same percent i.e. almost half sample was agreeing and half were disagreeing among the healthcare professionals this factor was counter by the study, in which they reported, that the referral system of patients for the treatment of gynecological problems was minimal [21].

CONCLUSIONS

The study concluded that the level of awareness among the research participants regarding the role of physical therapy in gynecological patients and they were highly motivated to treat the patients with this problem however, the feasibility of training programs, seminars, workshops, and webinars was poor and they were being unable to enhance the knowledge regarding the gynecological physical therapy in addition, the referrals of patients was limited.

Authors Contribution

Conceptualization: RHT
Methodology: SI[1], SI[2]
Formal analysis: OA
Writing, review and editing: RHT, SS, SRB, SI[1] AB, N

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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