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Pakistan Journal of Rehabilitation (PJR) has the privilege of being the first rehabilitative journal of Pakistan that invites manuscripts from the field of physical education, psychology, alternative medicine and varied domains of rehabilitation, thereby, pulling together disparate rehabilitation disciplines to enhance the quality of knowledge and decision making. PJR is a peer-reviewed biannual journal that started its publication in 2012 with the expressed aim to promote and disseminate scientific knowledge and to break scientific inertia in the field of rehabilitation in Pakistan.

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EDITORIAL

PROPHESYING THE NICHE OF REHAB PROFESSIONALS DURING COVID-19 PANDEMIC

The spread of COVID-19 in Wuhan has sent an alarming message to the whole world, if the same pattern continues globally, the healthcare community will be facing one of the biggest challenges of modern times which it seems ill-prepared for, both in terms of experience and resources. Unfortunately, such situations can lead to a collapse of not only the healthcare system of many states, but also to a human disaster that will affect the physical, psychological and socio-economic infrastructure of the whole society.

Pakistan is a country of limited resources and scarce qualified medical facilities and professionals. The healthcare system needs to adopt a multidirectional proactive approach that better prepares the nation to face upcoming challenges. The focus of this plan should be to provide emergency healthcare to COVID-19 patients and promote community-based advocacy to inhibit the spread of disease.

Rehab professionals can be employed in multiple roles as a part of this newly developing complex healthcare system. In primary healthcare, they can play a vital role in bringing up or developing community based programmes that will be much needed for proactive management of people who are vulnerable to COVID-19.

Physical therapists working in tertiary healthcare facilities are most likely to be members of the front line team involved in the treatment of confirmed or suspected COVID-19 patients admitted in hospitals. They may also unveil physical fitness programmes for the elderly population focusing on their general mobilisation and respiratory health. Whereas mindfulness programmes, play therapy sessions and social support may be facilitated by occupational therapists along with clinical psychologists for better mental health of the general population.

As per the National Health Survey of Pakistan, one of the major reasons for the increase in diabetes myelitis and hypertension among the population is a sedentary lifestyle. In fact, many of the people are unaware of their condition and not even diagnosed. Around 18% of adults under the age of 45 are diagnosed as hypertensive, which is one of the major comorbidity prone to COVID-19. Both exercise and physical activity, can improve overall health outcomes such as reducing the risk of a stroke, cardiovascular disease and type-2 diabetes.

Involving rehab professionals for the health and well-being of the population at this hour will be wherewithal of the national health policy to meet the scarcity of health professionals nationally. Moreover, it will be a proactive measure by the national health sector for dealing with a pandemic-like situation and preparing the nation to combat viruses by adapting healthy eating habits.

Pandemics always bring out an atrocious environment full of stress, panic, anxiety and disheartenment, which manifests in the form of physical and physiological health issues. Emotional stress releases hormones called cortisol that activate the sympathetic nervous system which in turn increases ventilation rate. Increasing physical activity while staying home during the lockdown will promote endurance in dealing with stress. Programmes like wellness and physical fitness based on aerobic, anaerobic exercises and relaxation exercises for maintenance of physical and mental well-being can be launched on public social welfare forums, national media and the national health forum for public accessibility to rehab professionals.

Mental fitness at the same time is as significant as physical health as it improves intelligence, the emotional status, and the social and adversity quotient. One of the studies in the past has declared prevalence of 10–66% of mild to moderate psychiatric illnesses among general population with an additional 0.1% of mental illness.

Exercise stimulates the production of endorphins, a chemical in the brain that acts as the body's natural painkiller and mood elevator. It is also responsible for the feeling of relaxation. The concept of mindfulness is incomprehensible among the general population, though we have spiritual healers and all, but keeping oneself busy or introducing activities that promote emotional wellness is considered a luxury.

Involvement of occupational therapists, clinical psychologists and counsellors in the national programmes for battling COVID-19 and its reducing impact on mental status of public may aggregate the spread and

poor prognosis of people. The rehab professionals must perform researches and provide evidences that promote the inculcation and utilisation of their services in the time of such misery that is affecting humanity globally. Many researches had already been conducted in Wuhan that indicated the fall of overall health and wellbeing of the population bringing forth baselines for developing proactive programs for effective strategies in handling COVID-19 since it might turn into a major disaster in 2020.

Sumaira Imran Farooqui
Associate Professor, Principal
Ziauddin College of Rehabilitation Sciences
Ziauddin University

LETTER TO THE EDITOR

CHALLENGES FOR PEDIATRIC PHYSICAL THERAPISTS TO PROVIDE EARLY INTERVENTIONS TO CHILDREN WITH CEREBRAL PALSY

By writing in the Pakistan Journal of Rehabilitation, I would like to draw attention towards challenges faced by pediatric physical therapists in providing early interventions to infants and children who are at risk of Cerebral Palsy within families and communities.

Cerebral Palsy (CP) is a common motor disability that occurs in childhood and affects more than four children per 1,000 live births across the world[1]. It is characterised by movement disorders that are attributed to a disturbance in brain development accompanied by secondary impairments[2]. Among mild to severe CP types, early physiotherapy interventions play a key role in decreasing poor health conditions such as soft tissue stiffness and joint contractures[2-3] and improves the pace of developmental mildstones accomplishment. Interventions such as primary care also reinforces efficient practice to stimulate neural connections; as a result functional performance increases[4]. Numerous studies concluded the effectiveness of a variety of intervention modalities in physiotherapy such as constraint-induced movement therapy, strength training, gait training, virtual reality, whole-body intervention and hippo therapy on heterogeneous sub-groups of cerebral palsy including spastic diplegia, hemiplegia and tetraplegia. However, it is difficult to conclude if these types would respond differently to various interventions[2-4]. Even for some of the interventions, the evidence is not strong enough to be implemented as early intervention.

Early intervention is the best practice to reduce the risk of Cerebral Palsy, but still pediatric physical therapists face continuing challenges due to poor clinical judgment, lack of training and evidence of standard care that may result in withdrawal of child from rehabilitation[5]. These issues must be considered for the management of children with cerebral palsy since early identification is the foundation for ideal intervention. Studies should be conducted to identify challenges faced by pediatric physical therapists to encounter barriers for benchmark practices in clinical settings. Although generating evidence is ongoing, we must also look into the national and local needs in context before implantation.

Shahla Batool
Physiotherapist
Freelancer

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SYSTEMATIC REVIEW

THERAPEUTIC EFFECT OF CUPPING ON NON-SPECIFIC NECK AND LOW BACK PAIN - A SYSTEMATIC REVIEW

ABSTRACT

BACKGROUND & AIMS

Neck and low back pain are the major musculoskeletal problems effecting people around the globe. Increasing number of researches underpin the effects of cupping in neck and low back pain. However, empirical studies are required to confirm the efficiency of cupping therapy. Therefore, the aim of this review was to examine the efficacy of cupping treatment in non-specific neck and low back pain.

STUDY SELECTION & ELIGIBILITY CRITERIA

This systematic review included Randomised Controlled Trials focused on cupping therapy and its effects on neck and low back pain. Extensive search was performed on Google Scholar, PubMed, MEDLINE and Pedro databases. Studies published from 2009 to 2017 were included.

RESULTS

Eight RCT's with a 659 sample size were selected for review. Compared to other cupping methods 'wet cupping', 'fire cupping' and 'cupping massage' were superior in reducing pain in neck and low back pain $P<0.001$. However, a few cupping techniques showed relatively less significant $P<0.133$, $P<0.05$, and $P<0.037$ in comparison to previously mentioned methods.

CONCLUSION

Cupping therapy can be beneficial in alleviation of non-specific cervicalgia and lumbago in short-term. However, due to weak evidence and a small sample size, the study was restricted from drawing a definite conclusion. Future high-level evidence and research work is required for confirmative and conclusive recommendation of cupping in clinical settings for musculoskeletal pain.

KEYWORDS

Low back pain, Neck pain, Prevention, Rehabilitation, Spine, Disease, Therapeutic.

Danish Rasool
Physiotherapist
Medcare Hospital (UAE)
danishrasool@hotmail.com

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INTRODUCTION

Low back pain (LBP) and neck pain (NP) are among the most common problems people suffer from in their life throughout the world[1]. NP is a predominant musculoskeletal condition affecting people of different age groups, including young adult to old age individuals[2]. Almost 60% to 80% of people suffer from LBP at some stage of their life[3]. Similarly, higher prevalence of neck pain persists in individuals with an average of nearly 50% in their lifetime[4]. Besides these worrying figures, the positive aspect is that people usually recover quickly following an episode of LBP and NP. Etiological factors of NP and LBP are many including inflammatory disease, joint disorder, musculoskeletal origin, degenerative diseases, poor posture, working for extended hours, driving for long durations[7,8]. Tension headache and migraine attacks are considered as risk factors of NP[9]. Most of the time a generalised term 'LBP' and 'NP' is used in the diagnosis index for a patient suffering from LBP and NP thus, indicating that mostly diagnosis is given as nonspecific LBP, either acute or chronic[10]. However, 20% of LBP patients[5] and 10% of NP patients[6] suffering from acute pain, go into the chronic phase. Due to chronic LBP, quality of life is compromised, which leads to further deterioration of a person's well-being, social relationship and physical abilities[11]. Similarly, severe NP attributes to compromised daily activities leading to psychological issues[12]. There is limited evidence of definitive treatment for non-specific chronic neck pain[13]. Conventional treatment such as medication and even surgery does not always guarantee the patient will be pain free[14]. Usually such patients apply home remedies to reduce their pain and discomfort[15]. In a patient population as such, there is a paradigm shift towards complementary therapy such as acupuncture, manual therapy and cupping therapy. In comparison to other pharmacological treatment, cupping therapy is an inexpensive, non-invasive and low-risk modality[16].

Since the last decade, there has been an increase in the trend of using cupping therapy for relieving LBP and NP in Middle East countries and China[17]. Cupping therapy is increasingly gaining popularity amongst athletes and Hollywood stars[18]. Since almost a decade there is lot of research being conducted on effects of cupping in different clinical conditions[19,20]. Cupping therapy is an old Chinese technique used for treating musculoskeletal, neuromuscular and other clinical conditions[21]. It has originated from Traditional Chinese medicine that prevailed thousands of years ago[22]. Cupping therapy is extremely helpful in different musculoskeletal conditions, arthritis, inflammatory disorders and other clinical conditions[23]. It is mostly done for relief from LBP and NP. There are different kinds of cupping methods available including holding, moving, shaking, fire and quick cupping. Two most commonly used techniques are "dry and wet cupping"[24]. Dry cupping is a method in which a plastic or silicon cup is placed on the skin and blood is drawn via suction method[25]. On the other hand, blood is drawn from lacerated skin into the cup in 'wet cupping' procedure[26]. Other techniques used are fire cupping, pulsatile cupping, cupping massage and moving cupping. However, basic principle of cupping is to increase blood flow and body energy[27]. A systematic review conducted on the effects of cupping on chronic back pain in 2018 concluded a positive impact of cupping in the selected population[28]. Another review was done regarding the outcome of cupping in the neck pain population only. To date, only one review was done back in 2015 which was suggestive of high-level of scientific studies to affirm the claims of published studies. Heterogeneity in studies and low-quality evidence are suggestive of rigorous appraisal of current literature. Therefore, this review will investigate previous and updated available literature about the effectiveness of cupping in nonspecific NP and LBP.

METHODOLOGY

The systematic review has followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

DATA SOURCES AND SEARCHING STRATEGIES

Following databases were searched; Google scholar, PUBMED, Physiotherapy Evidence Database and Pedro. Since there are limited publications therefore, search was conducted from 2009 to 2020 in order to include all valuable research work. Keywords used were "cupping", "neck pain", and "low back pain". Literature was searched related to various kind of cupping including dry, wet and pulsatile cupping. Moreover, cupping therapy itself or in combination with neck and low back pain were also searched.

ELIGIBILITY CRITERIA OF STUDIES

Searched literature was filtered by time frame. Data from 2009 to 2017 was included. Eligibility criteria for the studies to be included was Randomised Controlled Trials (RCT). Single and double blinded RCT's using any form of control in comparison with cupping were included. Furthermore, cupping therapy of any kind was used including dry cupping; wet cupping; empty cupping; moving cupping; medicinal cupping; needling cupping were examined for its outcome. Studies were excluded if they failed in showing the randomisation process.

DATA EXTRACTION

Pain was used as the main outcome measure in this study regardless of etiology. It must be assessed by Visual Analogue Scale (VAS), McGill Present Pain Index (PPI), and Oswestry Pain Disability Index (ODI) or by any other validated tool for pain measurement that should be self-reported or physician mentioned pain score. Moreover, additional outcomes were explored including quality of life reported by patient or physician.

TARGET POPULATION

Subjects of all age groups with neck and low back pain, either acute or chronic were included to assess the outcome of intervention (cupping) used.

RISK OF BIAS

The quality appraisal of the eligible studies was assessed and risk of bias was measured on six domains comprised of random sequence, allocation concealment, participants blinding, outcome assessment blinding, incomplete outcome data and selective reporting respectively.

Table-1 Characteristics of Included Studies (N=8)

Study Year	Sample Size	Intervention Group	Control Group	Outcome Measurement Tool	Duration	P-Value
Teut et al[27]. 2018	110 (49.0± 13.7 years)	Pulsatile cupping on LBP	Minimal cupping group and no intervention group (Paracetamol was allowed for both groups)	VAS	Twice weekly 4 to 12 weeks	p=0.063 p=0.133
Yazdanpanahi et al[17]. 2017	150 (25± 4.2 years)	Dry cupping on LBP	No intervention	SF McGill pain Questionnaire	Thrice weekly 2 weeks	P<0.05
Saha et al[28]. 2017	50 (52.6± 10.3 years)	Cupping massage on NP	Self-directed medical care	VAS	Twice weekly 3 weeks	P<0.037
Chi et al[14]. 2016	60 (43.6± 8.0 years)	Fire cupping on NP	No intervention	VAS	Not mentioned	P<0.001
Albedah et al[29]. 2015	80 (36.48± 9.3 years)	Wet Cupping on LBP (Acetaminophen was allowed)	No treatment, Medication (Acetaminophen) allowed	Numeric Rating Scale	Thrice weekly 2 weeks	P=0.0001
Lauche et al[18]. 2013	61 (54.1± 12.7 years)	Cupping massage on NP	Progressive muscle relaxation	VAS	Twice weekly 3 months	P<0.001
Cramer et al[30]. 2011	50 (6.17 ± 12.21 years)	Wet cupping on NP	Self-directed medical care with GP/Orthopedics	VAS NDI	Twice weekly for 2 weeks	P<0.001

Table-2 Risk of Bias of Included Studies (N=8)

Studies	Allocation Randomisation	Allocation Concealment	Baseline Comparability	Subject Blindness	Therapist Blindness	Assessor Blindness	Comparison between group	Follow up	Intention to treat analysis
Teut et al [27]. 2018	✓	✓	✓	✓	×	×	✓	✓	✓
Yazdanpanahi et al [17]. 2017	✓	✓	✓	×	×	×	×	×	×
Saha et al [28]. 2017	✓	✓	✓	✓	×	×	✓	×	×
Chi et al [14]. 2016	✓	✓	×	×	×	×	×	✓	×
Albedah et al [29]. 2015	✓	✓	✓	×	×	×	✓	✓	✓
Lauche et al [18]. 2013	✓	✓	✓	×	×	×	✓	✓	✓
Cramer et al [30]. 2011	✓	✓	✓	×	×	×	✓	✓	✓
Farhadi et al [31]. 2009	✓	✓	✓	×	×	×	✓	✓	✓

√ Indicate low-risk of bias
x Indicate high-risk of bias
? Indicate high-risk of bias

RESULTS

Search Results

Initially when a combination of a search term was used, it showed limited results. When the search term 'cupping therapy' was used on databases, it yielded 1200 results on Google scholar whereas, this number dropped down to 673 when the same keywords were used on PubMed. This trend continued and the figures plunged to 69 at Pedro database. Following reading of relevant headings and abstract, full-text article were stratified. As a consequence, eight studies which assessed cupping therapy effects on neck and low back pain are selected for review.

Characteristics of Included Trials

From eight included studies, a total of 659 sample size was included. Among selected studies three are conducted in Germany, two in Iran, one in Taiwan, one in Norway and one in Saudi Arabia. All of this research work is published in English. Female percentage in all the included studies is higher (70%) than that of men.

Among selected studies, four are conducted on effects of cupping on low back pain[17,27,29,31]. Similar

numbers of researches are done in the neck pain population[14,18,28,30]. Out of eight trials, three studies are done to assess the outcome of wet cupping in NP and LBP[9,10,25]. Cupping massage effects are examined in NP in two studies[18,28]. Furthermore, dry cupping, fire cupping and pulsatile cupping techniques are used to investigate the efficacy of cupping in LBP and NP in an individual study[14,17,27]. No comparison of cupping with sham or other complementary medicine technique were done in two trials[14,18]. However, only one study had a comparison of cupping with acupressure and control group[21]. On the other hand, patients were allowed to take medications for pain relief with cupping in a control group in four trials[27,29,30,31]. In the included studies, the primary outcome (pain) is measured by either VAS, Numeric rating scale (NRS), McGill pain questionnaire, Short form MPQ SF-36, and the Present Pain Index (PPI). The description is depicted in *Table-1*.

Risk Of Bias In Included Studies

Almost all the trials used concealed the method of sample randomisation apart from one study which did not mention sample randomisation method[17]. That sample were blinded to the intervention in only two studies[27,28]. On the other hand, therapists were not blinded in all the included research studies. Similarly, assessors in the studies were also non-blinded. Details mentioned in *Table-2*.

Cupping Methods

A variety of cupping techniques are being used in included trials. Wet cupping is used in three research studies[29,30,31], whereas two trials were conducted on cupping massage technique[18,31]. On the other hand, dry, fire and pulsatile cupping methods were used in individual studies. Among all, wet cupping and cupping massage technique appears superior to other methods in terms of reducing pain (p<0.001).

Effects Of Intervention

The effect of cupping therapy was assessed mainly by VAS in multiple studies. It included neck and low back pain. Neck and LBP, both conditions were treated whether it was chronic or acute. Therefore, outcome of cupping was assumed to be gross when assessed by VAS. On the other hand, a couple of trials used different tool such as, short form McGill present pain index to investigate the effects of cupping in patients.

Comparison Of Intervention With Control Group

In the included trials, comparison was done between cupping/treatment group (TG) and control group (CG). Three studies investigated the outcome of wet cupping and compared it with the control group. Firstly, NRS score was found to be statistically significant upon comparison with control group at a 4 weeks' time 24.4 (19.7–29.1) 56.3 (51.6–60.9) P value 0.0001[29]. Secondly, another study also claimed that the wet-cupping group had significantly lower levels of pain intensity ([95% confidence interval (CI) 1.72—2.60] mean difference = 2.17, p < 0.01)[31]. Thirdly, not much statistically significant difference between TG and CG was found. Mean intensity was 4.45 ± 2.17, and 4.18 ± 1.90 respectively, group difference at 95% CI was 0.28 (–0.91; 1.46) and p value was 0.64[30].

Furthermore, other trials conducted on assessing fire cupping outcome in NP also found a significant difference between TG from 9.7 to 3.6 and CG 9.7 to 9.5, P<0.001 following treatment[14]. In addition, dry cupping findings were also convincing following 2 weeks of intervention. Baseline readings in TG 31.8 ± 10.8, CG 31.8 ± 9.8, p-value 0.1. This changed dramatically following 2 weeks post intervention in TG 4.1±3.6, CG 14.0 ± 5.2, p value 0.001[17].

On the other hand, cupping massage result was not found to be promising when compared baseline figures of TG and CG 49.8 ± 21.8, 45.1 ± 16.3 and following 3 weeks of intervention 29.9 ± 22.9, 42.8 ± 15.8 respectively, –14.3 (–27.7; –1.0), P-value 0.037[28]. Similar results were obtained in the other study as well. VAS at baseline in TG and CG was 55.86±19.7, 56.36±18.6 respectively. Following 12 weeks of intervention it decreased in TG to 39.86±30.0, CG 45.26±23.5 and estimate group difference at 12 weeks was -0.16 (-13.90;13.55) and p value was 0.98[18]. Likewise, findings were obtained in the pulsatile cupping technique. Baseline readings of TG and CG were 53.2 ± 7.4 and 59.9 ± 12.8, following 12 weeks, mean adjusted VAS pain intensity was lower for pulsatile cupping vs. control 15.1 (3.1±27.1), p =0.014)[27].

DISCUSSION

Cupping therapy can be a useful tool in adjunct to available treatment options in complementary medicine therapy. Studies conducted on the effects of cupping in other clinical conditions also acknowledged it to be an effective tool to lessen the pain in chronic and acute conditions. Cupping is found to be effective in treating Fibromyalgia[16], carpal tunnel syndrome[18] and in critical conditions[17]. Among different cupping techniques, wet cupping procedure was suggested to be an effective tool in reduction of pain[9,10,25]. In these studies, pain score dropped dramatically following two weeks of cupping treatment. However, the major disadvantage of these studies was the use of pain medication not only in the intervention group, but also in controlled group. This might be the main factor of swift reduction in pain in both groups. Thus, raising questions upon the direct impact of cupping in alleviation of pain. Additionally, none of these trials used placebo for comparison of their intervention. Thus, it is difficult to confirm the conclusion drawn by the authors of these trials. Similar results were obtained in a study which used the fire cupping technique[3]. This study has many flaws including no blindness of sample, therapist, and no comparability. Lastly, although the pain intensity reduced in a short time, the overall duration of intervention used was not mentioned, which again places doubt in the mind regarding the clarity of the trial.

Furthermore, other studies also ascertain that pain reduced moderately in people treated by cupping

massage method[23,26]. Nevertheless, there is a major difference between the outcomes in both trials in terms of pain relief. Pain intensity went down by more than 50% in three weeks[23] only, whereas pain reduced by 25% following three months of treatment in the other trials[26] in chronic neck pain patients. Therapists and patients both were not blinded, small sample size and incomparability with other treatment groups are few of the short comings of these research work[23,26]. In comparison to the above excellent outcome, not much of a significant result was obtained when pulsatile cupping intervention was used for up to 12 weeks[19]. A similar kind of drawback was found in this study as well as discussed above. In spite of pain medication intake being allowed, the pain score did not decrease much. A whole trial was conducted and concluded by the same therapist involved in cupping. Hence, there is a high chance of bias in the conclusion of the trial. Moreover, various kinds of cupping techniques has been used in the studies. The biggest drawback of wet cupping is that it is not applicable for all people and all age groups[13]. Due to the sparse technique used, it is extremely difficult to confirm which type of therapy is effective in treating NP and LBP. Paucity of high-level of evidence is lacking in the current available literature.

Additionally, all the studies have a small sample size, weak strength of studies and no comparison of cupping with placebo are the major drawbacks of the current literature. Furthermore, a considerable number of people left the study including the experimental group during research work. This raises doubt on the conduct, transparency and efficiency of the study and its outcome.

Similarly, there is ambiguity in the specific points of cupping for LBP and NP. These findings could be due to the fact that it is still not a widely used treatment method in clinical settings around the world. Additionally, many people do not trust complementary medicine techniques due to its lack of evidence. Thus, the sample size remains the core issue in the available studies. As a consequence, implication of cupping therapy in clinical settings cannot be emphasised due to lack of strong evidence.

Besides the above discussed issues, the number of available scientific research is limited. Only eight studies were found for analysis regarding the efficacy of cupping, which is a very low number. More research work has been done, but it is not in English and has not been included in this review. Hence, the limitation of this review is the unavailability of studies to draw a definitive conclusion.

CONCLUSION

Cupping therapy can be a useful adjunct to the other available conventional methods for nonspecific NP and LBP. Current research suggests pain reduction with cupping therapy treatment. However, limited studies, low-quality studies, weak evidences and a small sample size in published trials are suggestive of future high-quality studies for affirmative conclusion.

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RESEARCH REPORT

PREVALENCE OF FUNCTIONAL FEEDING PROBLEMS IN CEREBRAL PALSY CHILDREN OF KARACHI

ABSTRACT

BACKGROUND AND AIMS
Cerebral palsy is a neurodevelopmental disability that not only affects sensory, motor or cognition domains but also oral motor area that may lead to difficulties in eating, chewing, swallowing, sucking or drooling etc. Therefore, this study aims to determine the prevalence of functional feeding problems in CP children of Karachi to evaluate their needs of feeding and role of rehabilitation regarding it.

METHODOLOGY
The cross-sectional survey was conducted on Cerebral Palsy children aged between 6-12 years with the number of participants n=40, recruited through the non-probability sampling technique. The data was collected through Functional Feeding Assessment Scale (FFA) taken from Multi-disciplinary Feeding Profile (MFP).

RESULTS
A sample of 40 participants with Cerebral Palsy were enrolled in the study. This consisted of 8 boys and 32 girls with mean age 8.67 ± 1.93 years. It was showed that participants have an average score in all domains of Functional Feeding as the oral motor area is affected due to Cerebral Palsy.

CONCLUSION
It was concluded that CP children suffer from a number of functional feeding problems that may lead to poor nutrition, loss of appetite and decreased quality of life. The large scale surveys are recommended for the identification of feeding problems in CP using standardised tools.

KEYWORDS
Cerebral Palsy, Diplegic, Feeding, Oral-motor, Management, Rehabilitation.

Mah-e-liqa Qureshi
Occupational Therapist
Department of Occupational Therapy
Centre for Autism Rehabilitation and Training, Sindh, Karachi.
maheliqa_qureshi@hotmail.com

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INTRODUCTION

Cerebral Palsy (CP) is defined as the most common developmental disability estimated from 1.5 to more than 4 per 1,000 children of a defined age range[1]. CP is caused due to non-progressive brain lesions based on neuromuscular movements, causing functional limitations. The onset occurs at birth and persists throughout the lifespan[2]. The symptoms may include increased or fluctuating muscle tone, hyperactive/exaggerated reflexes, decreased muscle coordination, involuntary movements and difficulties in walking, hand use, eating, excessive drooling, and speaking - making it the most common cause of severe motor disability among children[3,4]. Moreover, other disabilities like seizure disorders, mental retardation or learning disabilities often co-occur with CP[5]. In addition, due to fine or gross motor involvement, CP children frequently have oral-motor involvement that may include dysphagia of either type i.e. oral, pharyngeal or esophageal which may results in speech impairment, inadequate appetite and nutrition[6-7].

A number of studies suggested that the oral-motor dysfunction, subsequently with feeding problems has been observed in up to 90% of preschooler mild CP children that showed evidence of oral-motor involvement and reduced functional feeding skills[8]. Furthermore, the prevalence of feeding problems in CP children appears to be positively correlated with the disorder's severity and extent of motor involvement. The disease may affect oral motor skills, speech delay, difficulties with swallowing and sucking or drooling etc.[1-4]. Moreover, as the oral motor function progresses, it causes retardation and adverse consequences on physical and social health[3,5]. However, the pathogenesis of neurological lesion causing feeding problem is still unknown[4-5]. Breathing is inhalation and exhalation while aspiration is inhalation of foreign body into lungs that can cause adverse pulmonary conditions[6-7]. Moreover, it also causes loss of appetite and stressful meal time as one cannot take food to the mouth, although the severity of these problems differ in individuals with lack of sensorimotor, fine and gross motor coordination and cognitive deficits[7-8]. The feeding problems have a clinical significance that may influence the activities of daily living because the dysfunction can lead to progressive abnormalities if not addressed early. According to a study, the feeding problem causes difficulty in swallowing and chewing, and ultimately leads to excessive saliva formation, known as drooling that leads to pneumonia and untidiness of mouth[9-10].

A number of studies revealed that oral-motor exercises are effective in reducing feeding problem through active and passive exercises and sensory applications that increase stability and endurance of smooth muscle fibers[11]. Moreover, these exercises provide sensory input that enhances the feeding mechanism as well as mouth control.[12] Whereas, electrical stimulation and vibration may also normalise oral motor mechanism. Although these treatment strategies are most commonly applied by PT's, OT's and other healthcare providers, a debate exists regarding the effectiveness of these exercises[13]. Despite the severity of problems, prolonged feeding disorders results in a cascade of negative effects that may result in physical, emotional and cognitive development[14]. A study reported that feeding difficulties in children with moderate to severe CP, resulted in a poor nutritional status and health[13-14]. As a result, these children are at a high-risk of developing feeding and swallowing disorders that may have significant health implications including inadequate caloric intake and acute or chronic state of malnutrition[13-15]. In addition, children with CP face difficulty in achieving a nutritional intake that is sufficient to sustain a normal growth due to communication difficulties that inhibit requests for food, impaired expressions of food preferences, poor self-feeding skills and varying degrees of oral-motor dysfunction. Further complications may include aspiration of food and gastro-esophageal reflux affecting up to 75% CP children. It has been proven by studies that malnutrition in CP individuals is the most important thing to consider as that of poor, fine and gross motor and cognitive function since a proper diet is required for health. However, limited studies are available to evaluate the rate of prevalence in feeding problems and interventions addressing it therefore, this study aims to determine the prevalence of functional feeding problems in CP children of Karachi to evaluate their needs of feeding and the role of rehabilitation regarding it. The multidisciplinary team should make a strategic plan to provide professionals on a location basis so there will be teaching support for children[26]. As far as clinical measures regarding the pediatric oral motor feeding assessments tools is concerned, 12 assessment tools were identified including evaluating and screening of oral motor feeding problems and observing the feeding process. Most of the assessments were made for the children with developmental disabilities[28].

METHODOLOGY

Study Setting
Data was collected from special educational institutes, as well as primary and tertiary care centres of Karachi.

Target Population
Cerebral Palsy children aged 6-12 years.

Study Design
Cross-sectional study.

Duration Of Study
6-8 months.

Sampling Technique
Non-Probability Convenience Sampling Technique.

Sample Size
N=40.

Sample Selection
Inclusion Criteria
Spastic Diplegic Cerebral Palsy children aged 6-12 years with a mild to moderate condition classified according to Gross Motor Function Classification System Level were included.

Exclusion Criteria
Parents/guardians who refused the participation of their child, and children with severe conditions or secondary complications were excluded.

Data Collection Procedure
Data was collected from special educational institutes and rehabilitation departments of tertiary care hospitals from Karachi. All the subjects with diagnosed Cerebral Palsy with respect to inclusion criteria were recruited through the convenience sampling technique. Before the assessment, the participants' primary caregivers were provided with informed consent in order to provide detailed information about the study. Followed by the consent, functional feeding problems were assessed by using the Functional Feeding Assessment scale (FFA) taken from the Multi-disciplinary Feeding Profile (MFP).

Data Collection Tool
Data was collected through Functional Feeding Assessment scale (FFA) taken from the Multi-disciplinary Feeding Profile (MFP). The assessment will be based on the normal and abnormal patterns in the following section such as feeding, biting, chewing, cup/straw drinking and drooling occurring during eating. These will be categorised on responses of "Adequate", "Poor", "Absent", "Unable to Determine" and "N/A" on the scale of 1-5.

Data Analysis Strategy
Data was entered on SPSS (Statistical Product and Service Solutions) software. Participant's demographic details were represented through descriptive statistics, whereas the participant's assessment of feeding problems in each of the section was represented through frequency and percentage.

Ethical Considerations
All participants were given informed consent in order to provide detailed information regarding the study. Before commencement of the study, consent was taken to proceed further. The information of all the participants was kept confidential, whereas, participants could also refuse any time to take part in the study or provide any information related to the study.

RESULTS

A sample of 40 participants with Spastic Diplegic Cerebral Palsy enrolled in the study. This consisted of 8 males and 32 females with mean age 8.67±1.93.

On the Functional Feeding Assessment scale of the Multi-disciplinary Feeding Profile, it was reported that in spoon-feeding domain of FFA, highest mean scores of 3.08 ± 0.79 and 3.00 ± 0.84 were reported in open mouth to sight of spoon and keeping lips closed during swallowing. Abnormal patterns percentage are shown in *Figure-1*.

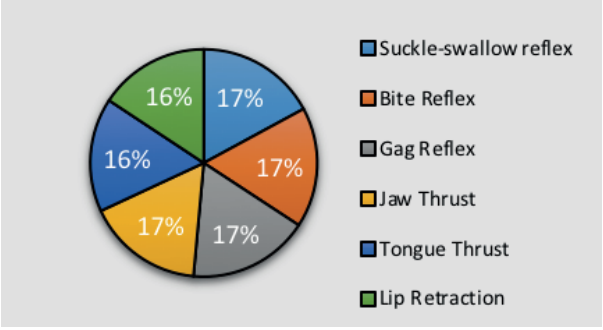

Figure.1 Abnormal patterns on spoon-feeding domain of FFA

In biting, all the participants have scored an average in all normal patterns while highest reported in exhibits controlled (graded) bite i.e. 2.73 ± 1.06, breaks through arrowroot cookie i.e. 2.73 ± 0.90, jaw thrust i.e. 2.90 ± 0.81 and gag reflex 2.80 ± 0.93 respectively, as shown in Figure-2.

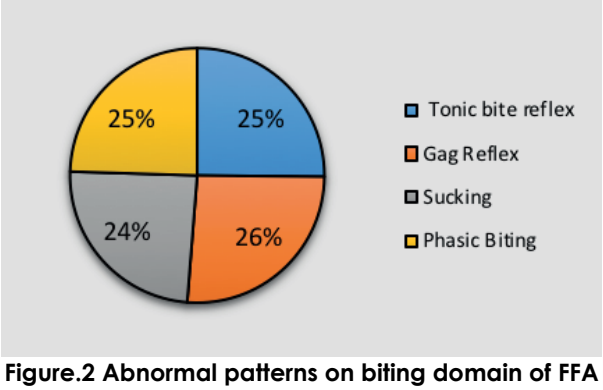

Figure.2 Abnormal patterns on biting domain of FFA

Similarly, in chewing, cup drinking and swallowing, all participants scored an average in normal and abnormal patterns with highest being reported in holds head steady, slightly forward in midline i.e. 2.90±0.81 and transports solids to back of mouth i.e. straw reflex i.e. 2.90±0.90 as shown in Fig-3.

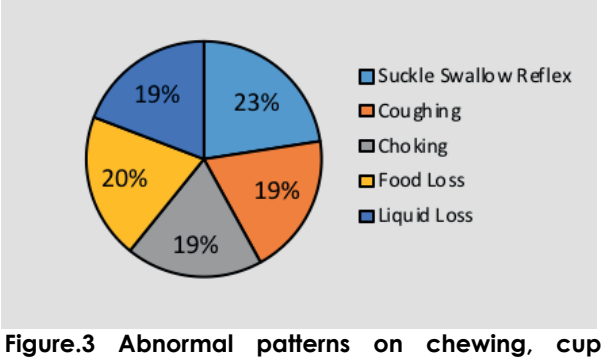

Figure.3 Abnormal patterns on chewing, cup drinking and swallowing domain of FFA

It was also showed that participants had drooling issues i.e. wet lips (28%) , wet chin to overt drooling (27%), excess saliva in mouth (20%) respectively.

DISCUSSION

The findings of this study revealed that children with CP have functional feeding problems on an average with mean scores in every domain of normal and abnormal patterns. It was revealed that swallowing, biting, drinking and proper feeding skills that play an important role in children's development are impaired and may lead to secondary complications. CP is a chronic developmental disorder that severely affects motor component of an individual resulting in adverse health consequences, yet various efforts have failed to prevent its occurrence[3-5]. Moreover, in most of the cases, the cause of CP is unknown and prematurity remains the most common risk factor among children. Thereby, these children suffer from multiple potential disabilities[4]. However, normal development requires appropriate oral skills as well as voluntary and involuntary movements of oro-facial and tongue muscles and coordination for sucking, swallowing and chewing purposes. However, in children with CP, normal functioning of these muscles are impaired due to abnormal tension and articulation of the tongue, and palate. Moreover, the sensory defects in these areas leads to the risk of strangulation, resulting in swallowing and drooling issues[13]. Apparently, these deficits result from the impairment of the upper motor neuron, causing swallowing disorder, problems in the formation of food morsel and delayed transfer of the solid and liquid food from the oral cavity to the gastrointestinal tract.

Multiple studies have stated that various nutritional and physical factors are related to poor growth in CP that may include oral-motor impairments, incompetency in swallowing and poor nutritional status[16-17]. Further, these problems include refusal to take food, lack of initiation, biting, chewing difficulties etc. Similarly, in our study, due to the small sample size, oral dysphagia is still unexplored although it is common in children with CP that they have a problem in feeding skills based on the dysfunctions of oral-motor movement such as dysarthria, apraxia, or drooling differences. The oral dysphagia is associated with severe complications, such as pulmonary aspiration and esophagitis etc. Thus, the child will be able to refuse the food[18-19]. It was also observed that the feeding domain was not thoroughly assessed by the therapist despite the standardised tools and questionnaire. However, no satisfactory tool has been established for the assessment of dysphagia. Several studies have shown that rehabilitation of dysphagia involves multiple professions in the treatment of physically disabled children with CP or other developmental disability[20]. Multidisciplinary orofacial therapies are also determined to be helpful in a clinical examination of dysphagia. A study conducted recently indicated that Nordic Orofacial Test-Screening (NOT-S) is a comprehensive screening method in children with cerebral palsy. It is also an effective and valuable tool for the comprehensive screening of orofacial dysfunctions.[21] Although, feeding difficulties are increasing in cerebral palsy children with gross motor problem and increasing age that may have an effect on physical as well as mental development[22]. Studies have concluded that impaired self-feeding skills are also associated with oro-facial involvement that may exacerbate growth retardation of CP children while according to some researchers, inadequate nutritional intake resulting from feeding difficulties is likely to be the main cause for the developmental delay. It has been evident that CP children with poor feeding problems have lower global health as compared to children with disorders other than CP[20-22]. Therefore, a valid screening tool must be utilised for the assessment of feeding problems in children to prevent from under nutrition[23]. Moreover, CP children without oral-motor involvement initially presented feeding problems but these difficulties were resolved as the children acquired more skills.

According to the neuroanatomical location of the lesion, studies have found that the severity of swallowing disorders varies in different types of CP[13,22]. Athetoid CP had the lowest severity of problems, whereas spastic Diplegic classification is more evident. The difference is due to the severity of swallowing problems that may be related to the extent and location of the neurological lesion[24]. In particular, CP is due to the two-sided injury of the pyramidal and extrapyramidal pathways with more damage to the corticospinal and corticomedulary pathways malfunction subsequently to more oral motor impairments and severe swallowing disorders as well as malfunctioning of the orofacial and even aspiration[23].

Despite the difficulties, early identification is necessary in life for children with oral-motor involvement that appear to persist with the development[19]. Therefore, large scale surveys are essential for the identification of oral motor or feeding problems in children with CP and number of trials must be conducted to determine the efficacy of multidisciplinary interventions for the management of dysphagia. Future investigations should utilise a longitudinal approach to inspect the development of feeding skills in CP children with varying degrees of oral-motor involvement.

Feeding problems are therefore crucial to investigate as they have a negative impact on the child's health and lead to a poor nutritional status and decreased quality of life. Although there are certain factors that aggravate swallowing problems in CP children with spastic and flaccid paralysis, these children have an inappropriate status while eating[20]. Therefore, in order to have proper nutrition, it is necessary to implement appropriate intervention and strategy. A child has to sit in a knee bending position that is kneeling on the floor with head and trunk rotated in one direction (in the center of gravity), whereas the neck is slightly forwarded to allow respiratory and oral movements. Such procedures are helpful to overcome feeding difficulties in these children. However, in spastic and flaccid children, this ideal condition is always not possible due to severe respiratory problems and aspiration. Another prevalence study revealed that

36% had motor speech problems, 21% feeding disabilities, and 22% had severe drooling. It was showed that all impairments were significantly related to poor gross-motor function and intellectual impairment. Although CP children are considered for with the individualised treatment plan that constitutes the combination of interventions in multidisciplinary rehabilitation, yet provision of family centered services is important in the rehabilitation. Moreover, palliative care is not the only solution to improve the quality of life. Furthermore, in cooperation with the child, his/her family members should be involved in a multidisciplinary rehabilitation. Therefore, the multidisciplinary team of rehabilitation work can achieve the child's target or goal. Hence, it was suggested to address the needs of the disorder thereby targeting the interventions that might be helpful to reduce the symptoms, although, insufficient evidence is available to determine the role of oral motor exercises on children with sensorimotor deficits and swallowing problems[24-25]. Also, there are a number of limitations in this study, including a relatively less sample size and outpatient settings for the recruitment of participants. Furthermore, a time constraint also prevents to explore more in this domain. Yet, types were not investigated based on the classification of the CP as feeding problems with this regard may have varying prevalence of feeding problems in Pakistani CP children. Subsequently, certain clinical measures have been used over a period of time to assess the oral-motor dysfunction in CP children[12-13]. Multiple studies highlighted the use of standardised assessments including speech problems, chewing, and feeding, swallowing or excessive drooling[3-4]. Moreover, a reliable and validated questionnaire or objective measurement might be helpful to rule out the feeding problems, therefore accurate evaluation is essential. However, exact prevalence is yet to be known due to limitations of available evidences at national and international levels. Future studies might be beneficial to provide an appropriate therapeutic intervention that not only affects the quality of life of these children, but also prevents direct impact on the emotional and physical health of these children. Thus, use of standardised tools in assessment of functional feeding problems are crucial to evaluate the issues, thereby facilitating for effective treatment strategies for CP. Feeding difficulties with the involvement of oral-motor impairments that can affect chewing, food ingestion and self-feeding are most common and can be severe. These difficulties may impact the caregivers for feeding their child, it can also further reduce nutritional intake [27].

CONCLUSION

It was concluded that CP children suffer from a number of functional feeding problems that may lead to poor nutrition, loss of appetite and decreased quality of life. Large scale surveys are recommended for the identification of feeding problems in CP using standardised tools. Furthermore, appropriate therapeutic interventions are suggested to prevent these impairments and facilitate healthy feeding to the children.

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RESEARCH REPORT

A QUALITATIVE ANALYSIS OF PARENTAL PERCEPTIONS ABOUT OCCUPATIONAL THERAPY INTERVENTIONS ON CHILDREN WITH SPECIAL NEEDS

ABSTRACT

AIMS & OBJECTIVES
To assess the perceptions of parents about Occupational Therapy interventions on their children using a self-administered questionnaire.

STUDY DESIGN
A Cross-Sectional Study

STUDY SETTINGS & PARTICIPANTS
Data was collected from OT departments of primary and tertiary care hospitals of Karachi. Parents of children with special needs enrolled in occupational therapy.

RESULTS
A total number of 72 participants were recruited. The information about the children with special needs with mean age of 7±3.8 was taken from the parents. Findings reported that a child improved in domains i.e. fine and gross motor, self-behaviour, communication and sensory motor with an average percentage.

CONCLUSION
It was concluded that OT is an integral part of rehabilitation that showed favourable treatment outcomes as perceived by parents of children with special needs. Further studies are needed to investigate the role of parents in a child's improvement and level of functionality for effective management.

Hira Shafi Zaeem
Occupational Therapist
Ziauddin College of Rehabilitation Sciences
Ziauddin University
hirashafi600@gmail.com

[Zaeem HS. A Qualitative Analysis on Parental Perceptions about Occupational Therapy Interventions on Children with Special Needs. Pak. Jrehabil.2020; 9(1):17-22]

KEYWORDS
Activities, Autism, Rehabilitation, Therapy, Disability, Quality of Life.

INTRODUCTION

Occupational therapy (OT) is a therapeutic intervention that is used to promote health by improving skills, competence, and independence in daily living skills[1]. In particular, it is a client-centred health profession that is concerned with enhancing health and well-being through the use of diverse OT interventions[1]. In addition, occupational therapy enhances quality of the life, increasing the latitude of choices and the freedom of the individual with special needs[1-2]. Furthermore, the use of occupational therapy as a treatment has been contrasted with the development of physical medicine and rehabilitation. According to Carol and McCudden, dominance to the physician over the development of occupational therapy profession was given during the 19th century with respect to healthcare delivery to gain acceptance as a part of rehabilitation team[3]. Therefore, it is considered as an essential part of rehabilitation[4].

Consecutively, children with special needs required efficient healthcare services as they are at risk of developing chronic disabilities, developmental, behavioural and emotional conditions[5]. Moreover, there is an immense need of quality service providers and rehabilitation centers in the community to provide services to these children so they can live an independent life[6]. Furthermore, in rehabilitation, primary caregivers or parents are an integral part of the child's occupational therapy as it is crucial to determine parental satisfaction to ensure treatment efficacy. The satisfaction of parents is the most common factor that needs to be considered in the evaluation of healthcare interventions in a special population[7]. For this reason, occupational therapists promote development, independence and personal growth of the children. Therefore, it is essential for the parents to understand and perceive the changes in their children before and after occupational therapy [8]. Moreover, the parents' perception is highly dependent on the therapist's communication to ensure effective understanding. This may limit the effectiveness of therapy provision considering parent's needs and expectations to their child's treatment [9]. In addition, parent satisfaction in occupational therapy treatment has an overall effect on the improvement of the child, the enjoyment of the sessions, group and individual one to one session, home programmes and school visits. Increased satisfaction of parents correlates with the positive partnership between the occupational therapy service providers and parents. Thus, it is necessary to evaluate the parent satisfaction and perception for the formulation of better treatment strategies[10]. Unfortunately, due to scarcity of studies, no study has been conducted in Pakistan to determine parental role, and the perception and attitudes towards their child's treatment. Therefore, this study aims to determine the parental perception of occupational therapy intervention on the children, which will lead the primary caregiver to enhance the treatment protocol for effective treatment strategies.

The current science practice has led the spectrum of healthcare towards a variety of interventions that aid a person to live an independent life, thereby minimising the disability[11]. In the field of rehabilitation, occupational therapy interventions are considered to have a variety of ways to help children with disabilities. The targeted interventions used in the field are incorporated in terms of children. The involvement of a parent or a guardian is extremely necessary to oversee and regulate the flow of treatment[12]. Moreover, families that are subjected to challenges are required to boost the confidence in accepting and dealing with specially-able children to reduce distress. Therefore, it is highly essential that their participation in therapies is encouraged as it grants a sense of emotional stability to both the child and the parents, and as a result, strengthens the therapeutic advancement of their child[13]. In a culture-run society, what individuals need the most is awareness and acceptance. There is also a need of debunking false assumptions regarding healthcare service providers that create misunderstandings regarding therapists. For better development of a child, the span of knowledge the parents have monitors the flow of a therapeutic treatment and might be helpful for a schema regarding treatment into a healthier environment and sense of trust. Kolehmainen et al illustrated the willingness of parental involvement and steered the duration of the therapies; the mother's concerns were considered and dealt with by the therapists, and the progress the child showed at home helped the therapist to plan the treatment/maneuver accordingly[14].

Thus, parent's selection, identification and implementation of treatment plan influences the outcomes of therapy in children with special needs [15]. On the other hand, Mire et al (2015) predicted the use of various treatment categories, parent perceptions, and use of a treatment category, was slightly stronger than child- and family-specific factors[16]. The findings contributed in highlighting the need of parents' understanding regarding treatment selection and decision-making[15-16]. Moreover, it is demonstrated that the degree of satisfaction of the parents of children who undergo occupational therapy intervention is considered an important factor to reduce their anxiety and improve their satisfaction regarding their child's care[17]. Moreover, it was indicated that the most significant attribute i.e. exposure of experiences, helped parents to expand their own horizon of perception regarding physical and occupational therapy[18]. In addition, it encouraged other community members to create goal-settings and progress-monitoring of their children subjected to occupational therapy[19]. Another study reviewed the understudied literature of parent's participation and engagement in child and family mental health treatment, was mainly concerned with the parent's engagement participation and its outcome on the treatment. It was concluded that whether the parent's participation engagement has overlay with attendance engagement has higher rates of overlap with parent attendance[20].

METHODOLOGY

Study Design
A cross-sectional study was conducted.

Study Setting
Data was collected from the OT departments of tertiary care hospitals of Karachi i.e. Dr. Ziauddin University Hospital, Liaquat National Hospital (LNH) and Institute of Physical Medicine and Rehabilitation (IPM&R).

Duration of Study
6 months.

Sampling Technique
Non-Probability Convenience Sampling Technique.

Target Population
Parents of children with special needs enrolled in OT.

Sample Size
The sample size was calculated using online software open EPI, open source calculator version 3.01. Considering 100000 population with 50% of anticipated frequency, therefore a sample of 72 was calculated at 95% Confidence Interval and 8% bound of error.

Sample Selection
Inclusion Criteria
Parents/guardian of children aged 6-15 years with special needs enrolled in rehabilitation for ≥ 6 months were included.

Exclusion Criteria
Parents/guardian of children aged ≤6 or ≥15 years with special needs enrolled in rehabilitation for ≤6 months or those who refuse to participate were excluded.

Data Collection Procedure
Data was collected from the rehabilitation department of primary and tertiary care hospitals. Parents of children with special needs were approached and recruited as a sample using convenience sampling technique.

Data Analysis Strategy
Data was entered and analysed on SPSS (Statistical Package for Social Sciences) version 20. Participant's demographic details will be represented through descriptive statistics, whereas participant's responses represented through frequency and percentage.

Ethical Considerations
The researcher provided complete information about the study to each and every participant before starting the study. The information procured from the participants was kept as confidential information. Every participant was given full rights of withdrawing at any time during the study. Firstly, an informed consent was given for volunteer participation. Subsequent to the consent, a self-administered questionnaire was provided to answer the questions regarding the impact of OT intervention on their children according to their perception was provided to the participants to assure their confidentiality and rights, moreover details regarding the study were also provided to ensure their participation.

Data Collection Tools
Self-administered questionnaire comprising of 14 questions was used in the study. The questionnaire was divided into Fine Motor Skills, Gross Motor Skills, Self-behaviour, Communication and Sensory Motor Skills. Each domain consisted of 3 questions using 'Yes', 'No' and 'Sometimes' options, except for Q14 that consisted of 10 mm scale to rate the child's improvement.

RESULTS

A total number of 72 participants voluntarily participated in the study, including 48 males and 24 females. The information about the children with special needs with mean age of 7±3.8 was taken from the primary caregivers, in particular parents. The detailed description is demonstrated in Table-1.

Table-1 Demographic Characteristics

Number of Participants	
Parents	n = 72
Children	n = 72
Gender	Male (n = 48) Female (n = 24)
Age	7±3.8
Diagnosis	
Cerebral Palsy	20 (28%)
Autism	12 (23%)
Delayed Milestones	12(23%)
Down Syndrome	2 (5%)
ADHD	9 (12%)
Other	17 (23%)
Duration of Therapy/Session	43±11.3
No. of session/week	2.1±0.6

In the domain of fine motor skills, majority of parents (34%) respond that their child is able to perform fine motor movements with appropriate griping, whereas 32% parents reported that their child can perform well coordinated movements as shown in *Figure-1*.

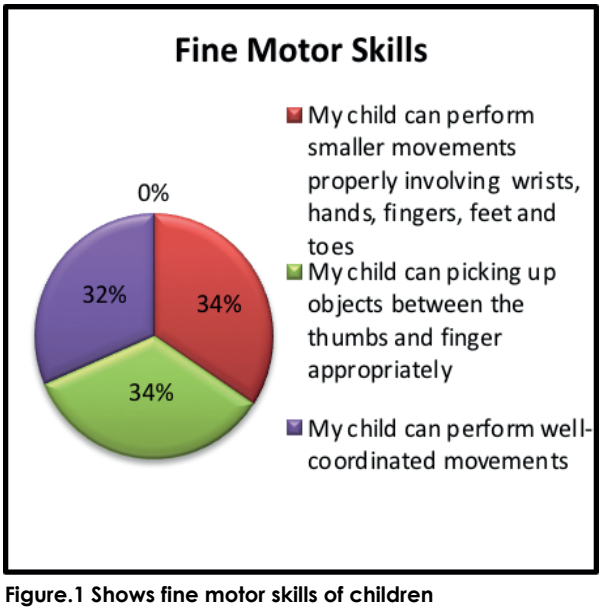

Figure.1 Shows fine motor skills of children

On an average, 56% of the parents reported that their child can adequately balance in different alternate positions, whereas 44% reported that their children can perform ADL's adequately as shown in *Figure-2*.

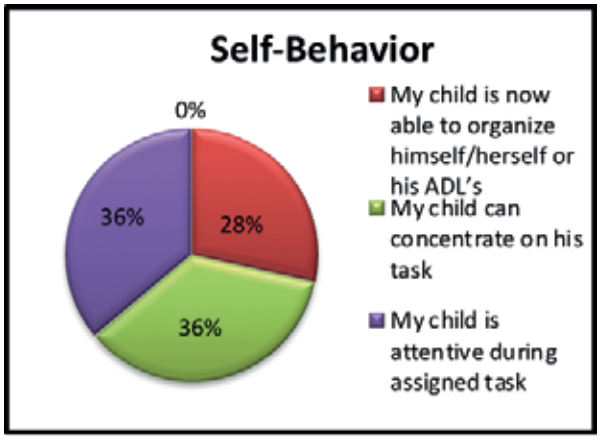

Figure.2 Shows self-behaviour of children

However, in comparison to other domains, only 28% parents reported their child being able to organise him/her while 36% reported that the child is focused and attentive in the assigned task as shown in *Figure-3*.

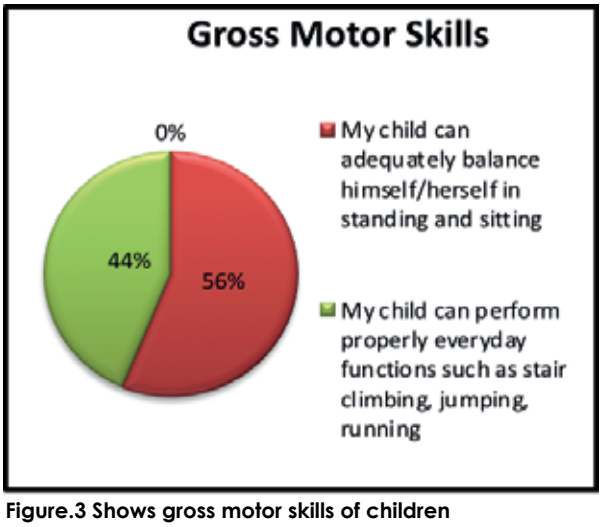

Figure.3 Shows gross motor skills of children

The findings also showed that 32% to 34% participants can effectively communicate and get along with others as well as shown in *Figure-4*.

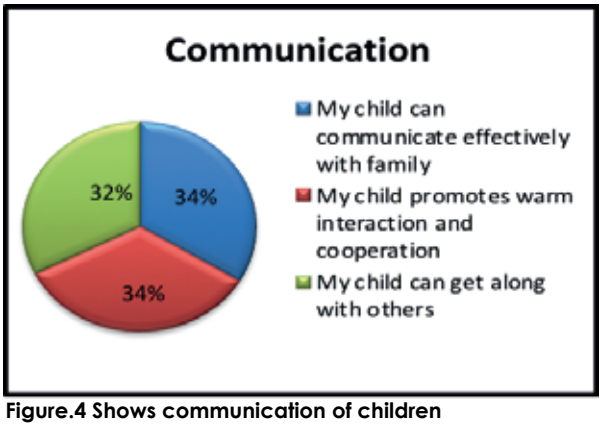

Figure.4 Shows communication of children

In the last domain, high percentages i.e. 51% and 49% showed that parents reported improved motor function and cognition of participants as shown in *Figure-5*.

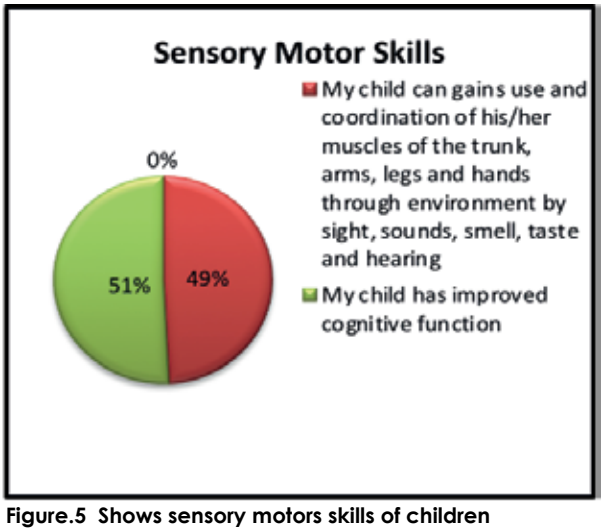

Figure.5 Shows sensory motors skills of children

DISCUSSION

The results of the study reported that in fine motor domain, 34% of children have improved in movements of wrist, fingers, hand, feet and toes and holding small objects between their fingers and thumb while, 56% have improved their balance during sitting and standing. Whilst, lowest percentages reported in self-behaviours and self-organisation skills i.e. only 28% of the children have shown improvement in organising themselves in activities of daily life. Furthermore, parents reported greater improvement in sensory motor skills domain i.e. 49% to 51% of children have shown improvement in coordination and cognitive skills. Therefore, it is indicated that parents have positive perception regarding occupational therapy intervention in their children suffering from different special conditions. Children who were receiving long duration of sessions have shown more improvements as compared to those who received less duration of sessions. Therefore, the overall rating of parental perception was found to be 6.17, which revealed moderate improvement. To the best of the author's knowledge, this study is the first to be conducted in Pakistan to determine parental perception in Occupational Therapy interventions. Subsequent to this, parental participation in OT interventions has shifted towards a family-centred approach around the world, thereby highlighting the crucial role of parents in rehabilitation. Moreover, there is some evidence that ascertain the intrinsic and extrinsic factors as well as cultural influences on child's therapy and parental participation that may lead to improvements in self-efficacy and occupational performance. Therefore, parental participation is highly encouraged in rehabilitation settings to understand the aspects of management while also training them for home programming in order to achieve healthier perception towards child care.

Despite our results, a study conducted by Russel et

al compared intensive Neurodevelopmental Therapy with Occupational therapy services on hands of children with Cerebral Palsy showed no difference on quality of hand function, upper extremity movement and parent's perception of the child's hand function activities when children are receiving therapy. Moreover, findings of the study showed no evidence of immediate or short-medium term benefits of treatment. This raises the need that parents must be involved in therapy sessions to identify their child's needs and determine the improvement with respect to therapeutic management[21].

It has been suggested by number of references that collaborative work of parents and therapists in identifying child needs and implementing a treatment plan would be beneficial for favourable health-related outcomes. Since the family serves as a unique entity in patient care, their assistance is valuable for effective recovery[20]. Moreover, it may also be helpful to design unique aims and goals for the child accordingly as per the understanding of therapists and parents. Therefore, involvement of parents in formulating therapeutic strategies will serve as an important aspect in care of the child, whilst improving occupational performance. Despite of this fact, family-centred practices are difficult to implement in most of the cases that may occur due to lack of parental knowledge, attitude and certain beliefs related to child care and development, in particular with disabilities[26]. Although, therapists emphasised on this approach to gain improvement in treatment goals and are designing specific home programmes involving both the child and parent participation[18-20]. However, lack of parent's involvement in therapy may lead to affect outcomes of the intervention if not followed properly. This leads to a communication gap between parents and therapists and may affect perception towards intervention.

In another study, the mother's perception regarding influence of PT and OT services on their care giving competency was assessed. It was found that parents of children with disabilities have better care giving capabilities towards their children [22]. Also, it promotes positive support from the therapists to their children associated with the understanding and treatment efficacy. In contrast, Kruijsen-Terpestra et al (2014) suggested that understanding the experiences of parents with their child's intervention might help to meet the needs of parents and subsequently get them engaged in their child's intervention in relation to the physical and/or occupational therapy of their child in a rehabilitation and acute care setting.[23]While in most of the studies the role of the parent in child's intervention was not well explained, that makes it more difficult to interpret the outcomes in relation to the specific aspects of therapy and intervention and degree of parental involvement. Furthermore, it was concluded that the parent's involvement and perception is essential for a child' improvement and for the smooth conduction of the therapy programme[16]. In particular, the number of approaches have encouraged parent training for effective home care and treatment outcomes that will be operative for the growing realisation regarding their roles in child management[20]. Studies have also concluded that parent training empowers families, within a culturally sensitive framework[26]. Moreover, this approach has the potential to optimise the effectiveness of therapy goals. Therefore, parent training model should be studied and implemented in a variety of contexts that would be helpful to improve the practice, perceptions, experiences, and effectiveness of OT interventions and practice in patients.

However, our study showed certain limitations including time constraints, scarcity of researches as well as parental unwillingness to participate; therefore, the study was conducted with a relatively small sample size. Subsequently, it is suggested that parents' perception should be taken in to consideration for effective management. Moreover, further studies are suggested to investigate the role of parents in child's improvement and level of functionality for favourable outcomes.

CONCLUSION

It was concluded that Occupational Therapy is an integral part of rehabilitation that showed favourable treatment outcomes as perceived by parents of children with special needs. Moreover, further studies are suggested to investigate the role of parents in child's improvement and level of functionality for effective management.

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RESEARCH REPORT

ASSOCIATION OF LEVEL OF BURDEN AND QUALITY OF LIFE AMONG HOME-BASED THERAPISTS OF STROKE SURVIVORS

ABSTRACT

OBJECTIVES
The incidence of stroke is high among the Pakistani population as compared to developed countries. Studies concluded that home-based rehabilitation therapy increases the quality of life of survivors; however, it also increases the burden on rehabilitation therapists. Thus, this study aims to investigate the association between the level of burden and quality of the therapist's life to address health-related outcomes

STUDY DESIGN
Cross-sectional survey.

STUDY SETTINGS & PARTICIPANTS
Total numbers of 100 therapists working in home-based rehabilitation were selected through the non-probability sampling technique. The data was collected through the World Health Organization Quality Of Life (WHQoL) questionnaire and Zarit Burden Interview.

RESULTS
A total number of 150 participants enrolled in the study, which comprised of 50 males and 100 females with a mean age of 25.8±5.14 years, while 50 refused to participate. The results show no significant association between the level of burden and quality of life. On the WHOQoL scale, 39% of the participants showed moderate to severe level of burden, 21% had mild to moderate burden while 19% had a level of severe burden.

CONCLUSIONS
Home-based therapy for stroke survivors has shown beneficial impact by implementing client-centred practice, however it also increases the burden on the caretakers and therapy service providers. The participants of the recent study have an average quality of life and an increased level of burden therefore, further studies are required to address the healthcare needs of therapists working in a home-based setting to improve health outcomes of both the therapist and the patient.

KEY WORDS
Quality of life (QOL), home-based, home care services, stroke, rehabilitation.

Maha Khan
Occupational Therapist
Ziauddin College of Rehabilitation Sciences
Ziauddin University
maha.khan64086@gmail.com

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INTRODUCTION

Stroke is also known as cerebrovascular accident, which occurs due to an interruption of blood supply to brain. Globally, it is the leading cause of death and long-term disability. It lowers the survivor's quality of life due to its poor health outcomes such as neurological co-morbidity, physical and cognitive impairments; this consequently increases economic burden on the family and community. The prevalence of a stroke is very high in Asian countries. Seventy per cent of global stroke burden is on low and middle-income countries. In the last decade, Stroke related mortality was found to be decreasing in East-Asian countries such as Japan and Korea. In South Asia, the minimum mortality rate of stroke in 2010 observed in Bangladesh (54.8/100, 00). Mortality rate in India and Pakistan is close to each other 82/100,000 and 83/100,000 respectively[1]. The risk factors of stroke include hypertension, diabetes mellitus; prolonged contraceptive use, dysthymias (atrial fibrillation, atrial flutter) rheumatic/valve heart disease, socioeconomic background, and health status. According to the current prevalence rate of stroke in Pakistan, hypertension is the most common risk factor[2]. It has been evident that stroke is the major cause of dysfunction in adults, the rate of stroke is high between 50 to 60 years of age thereby increases mortality ratio, resulting in an increased economic burden on society. Stroke is also a major cause of disability and poor quality of life in the elderly. It results in poor health outcomes such as prolonged hospital stay, reduced functional mobility and dependency for ADLs[2-3].

Recent studies suggest that neuronal regeneration after stroke helps in spontaneous recovery. Immediate rehabilitation from a multidisciplinary team is linked with improved health outcomes. Post-stroke rehabilitation services by occupational therapists and physiotherapists are the keystone of treatment; the early rehabilitation intercessions have a more prominent advantage to the client[4]. Post-stroke rehabilitation is generally provided in four settings: inpatient rehabilitation facility, skilled nursing facility, outpatient facility and home-based rehab programmes. According to one study, patients who received rehabilitation services at home after stroke had lower depression rate as compared to those enrolled in rehabilitation at a hospital setting[5]. Furthermore, home-based rehabilitation is cost-effective and encourages active participation of caretakers. The multidisciplinary care in a home environment promotes client-centred intervention. Each professional in the team has its unique role. Physiotherapy is helpful in maintaining, developing movement and functional independence after a stroke[6]. Studies demonstrated a significant improvement in functional performance by implementing home- based occupation-focused activities and tasks in which cognitive, behavioural and environmental strategies were used[7].

Previous researchers have identified a high amount of burden among caregivers of stroke survivors (with partial and complete disability), adversely affecting caregiver's quality of life. Providing continuous care to a stoke survivor increases burden on the caretaker, which many times may manifest as fatigue, depression and irritable mood[8], therefore home-based rehabilitation is needed to improve functionality of stroke survivors and reduce burden on the caretaker. Moreover, Longitudinal Analysis shows the quality of life of a person with CVA and their caretaker correlates with each other[9]. Further studies highlighted that home-based rehabilitation increases the quality of life, improves functional performance and reduces further risk of deterioration[10-11]. Also, home-based therapy reduces potential problems of transfer of learnt skills from training setting to home setting. A qualitative study conducted in 2000 by Sues Stephenson, fellows identified therapist, and patient view about home-based therapy. Patients highlighted two main benefits of home-based therapy: convenience and relevancy however, therapists posits difficulty in maintaining control during therapy sessions and increased burden affecting their quality of life.

World Health Organization defines quality of life as the perspective of an Individual of its life in relation to its culture, and value system in which they live to achieve their goals and meet expectations of the society. It is a broad concept that addresses ones physical health, psychological state, personal belief and relationship to its environment[12]. World Health Organization Quality of Life - BREF (WHOQoL) assesses quality of life in a variety of settings and population groups. The purpose to develop this assessment tool was to develop a questionnaire to assess quality of life cross-based on their perception to their personal goals, value system and culture. Many researchers have used WHOQoL along with Zarit Burden Interview, which is a caregiver self-report measure; to identify the impact of care giving to stroke survivors on the level of burden and quality of life.

Client-centred stroke rehabilitation at a home setting showed to significantly reduce disability and improve health outcomes of stroke survivors; however, studies have shown that it increases burden on caretaker and home-based therapists reducing their quality of life; which may impact the continuity of home-based therapy and quality care to patients. A study conducted in 2014 at Nigeria identified that the quality of life of caregivers and therapists inversely correlates to a caregiver's burden, also the lower functioning of stroke survivors significantly associates with care giving burden[13].

This research article focus on quality of life and level of burden on Physiotherapist and Occupational Therapist providing home based rehab care. The physiotherapist focus on restoration of body moments interrupted due to any injury or insult while Occupational Therapist works for improvement of functional skills and maximizing of independency in activities of daily living. The work nature of both the professionals is high physical and emotional demanding. It includes many manual tasks, carrying and lifting weight, repetitive tasks and

providing emotional support to patient and their families. Due to lack of rehab equipment, therapist often takes awkward positions and postures which increase stress and strain on joints and muscles. The outcome of is work related musculoskeletal disorders and fatigue. These outcomes also impact the mental health of the therapist and work performance.

The purpose to conduct this study is to identify the relationship between level of burden and quality of life of therapist who provides home-based rehabilitation to the stroke patients. This will help to address the health related concerns of patient and therapist.

METHODOLOGY

Study Design
Cross-sectional survey

Study Design
The study was conducted at various Rehabilitation Departments of primary and tertiary hospitals of Karachi including Dr. Ziauddin Hospital North Nazimabad and Clifton Branch, Liaquat National Hospital (LNH), Institute of Physical Medicine and Rehabilitation (IPMR).

Duration of Study
6 months.

Sampling Technique
Non-Probability Convenience Sampling Technique.

Target Population
Home-based therapists dealing with stroke.

Sample Size
The sample size was calculated by using EPI software[14]. A study conducted in the year 2018 entitled "*The Epidemiology of Stroke in a Developing Country (Pakistan)*" was used for calculating a sample size. By keeping the Confidence Interval of 95%, bound of error of 7%, a sample size n=147.

- **Inclusion criteria**

Physiotherapists and occupational therapists providing home-based rehabilitation services to stroke patients.

- **Exclusion criteria**

Therapists who do not provide home-based rehabilitation services in stroke rehabilitation or those who refuse to participate.

Data Collection Procedure
Data was collected from Rehabilitation Department of primary and tertiary hospitals of Karachi. Prior to the data collection, all participants were provided detailed information about the study and informed consent was obtained. Followed by the consent, participants were given the World Health Organization Quality of Life (WHOQoL) and Zarit Burden Interview (ZBI) questionnaires to evaluate the amount of burden and its relation with their quality of life of home-based Rehabilitation Professionals (OT, PT) working with stroke patients

Data Collection Tool
Data was collected through two outcome measures: World Health Organization Quality of Life (WHOQoL) and Zarit Burden Interview (ZBI) questionnaires. The questionnaires were modified to research requirements. The WHOQOL-BREF is a commonly used questionnaire that consists of four domains (psychological health, environmental health, physical health and social relationships) [15]. Higher domain score indicates higher quality of life. Mean score of all questions in each domain compute the domain score. Mean scores are then duplicated by four to make domain scores comparable by the scores utilised in WHOQOL-BREF.

Zarit Burden Interview (ZBI) is an effective and reliable tool for determining the burden that a person experiences in their current life situation[16]. Interviews are based upon 22 questions in which each question score is 0-4 points. According to the scoring key: 0 - 21 indicates little or no burden whereas, 21 - 40 indicates mild to moderate burden, but 41 – 60 means moderate to severe burden and 61 – 88 score is considered as severe level of burden.

Data Analysis Strategy
The statistical software named SPSS (Statistical Package for Social Sciences) was used find out the statistical tools and to analyse the data. Participant's demographic details (including age and gender) were represented through descriptive statistics which includes tables of mean and standard deviation along with a graph i.e. histogram. Moreover, chi-square test of association used to indicate the association between the variables.

ETHICAL CONSIDERATIONS

In this study the researcher provides detailed information about this particular topic and all the participants were provided detailed information about the research process and purpose. Moreover, the participants were also made aware with consent forms at the time of conducting research. The data was collected after obtaining informed consent from the participants and it is assured that all the information is highly confidential.

RESULTS

To conduct a detailed review and study on this kind of a topic, the researcher took a sample size of total 150 participants (50 males and 100 females) enrolled in the research while 50 generally refuse to participate; the mean age of participants was found to be 25.8±5.14 years respectively as shown in *Table-1* which generally shows that the selected participants fall in

between the age of 19 to 31 years.

Findings of the study mostly shows that participants generally have a mean score of 65.89±16.7 (which essentially lies in the series of minimum value 48 and the maximum value of 81) in WHOQOL-BREF (*Table-2*). The descriptive statistics graph shows that 39% lies under moderate to severe burden, whereas, 21% specifically showed mild to moderate burden while 19% specifically had severe burden as shown in *Figure-1*. The value of Likelihood Ratio found 0.79 and the value of Pearson chi-square which mostly is also known as p value generally is 0.24. Both of these values show that there essentially is no statistically significant association found between level of burden and quality of life. (*Table-2*).

Table-2 Association between Level of Burden and WHQoL-BREF	
No. of Participants	n= 100
Pearson Chi-square	0.24
Likelihood Ratio	0.79

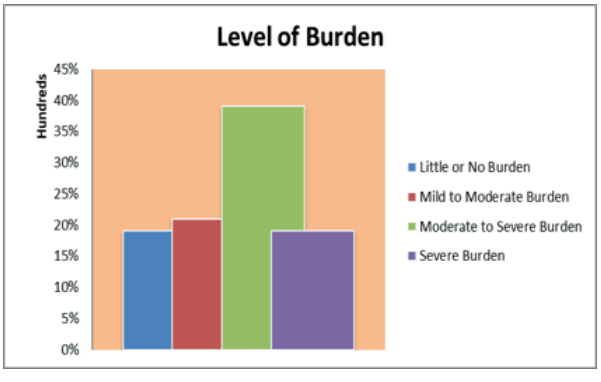

Figure-1 represents level of burden

DISCUSSION

The findings of the study revealed that the participants demonstrated slightly higher than average quality of life on the scale of WHO_QOL-BREF and on ZBI scale.

Table-1 Demographic Characteristics of Participants	
No. of Participants	n= 100
Gender	Male (n=30) Female (n=70)
Age (Years)	25.8±5.14

60% of the participant's burden level falls into mild to severe level (39% moderate to severe burden, 21% mild to moderate) while 21% showed mild to moderate burden, and 19% had severe burden. However, no significant association was found between level of burden and quality of life. The scores of the present study are similar to the findings of a study conducted in 2016 on stroke survivors' caregivers. The caregivers of stroke patients show average quality of life (62%) on WHO_QOL-BREF and moderate burden level (29%) on ZBI scale. Furthermore, this study also did not find significant association between quality of life and burden on the therapist[17].

Many factors contribute to the burden on the therapist in a subtle way. Earlier studies specifically identifying the risk factor of physical stress faced by occupational and physiotherapist, consequently affecting the quality of life, really was a fairly physically challenging role, with excessive twisting and bending tasks, lifting, carrying and transferring generally heavy objects. Furthermore, in home-based therapy sessions, the therapist receives minimum assistance during the session as compared to hospital-based sessions. All of these factors increase physical burden on the therapist and affect their standard of living significantly[18-19].

Similarly, a study conducted in Africa also reports that care-giving role to stroke patient is challenging which increases the physical and emotional burden on the caretaker affecting their quality of life. The study found that the caregiver experienced emotional distress and care giving strain[20].

On the contrary, some studies do not found association between physical activity and health related outcomes of the therapist. A study conducted in Australia founded that the therapist had higher than average activity level in a week and only few of them complained for discomfort and pain[21].

Many studies have identified a similar level of work burden on the therapist working with stroke patients in hospital and patient's home[22]. According to a study, the participants (therapists) were satisfied with their work despite of moderate level of physical and psychological stress. This was due to moderate to high level of job control. The therapists were allowed to suggest and bring ergonomic improvements to reduce work-related stress,[23] while burnout and emotional exhaustion in the therapist was found in settings where the therapist had a strict and tough routine and less job control[24-25].

Many factors contribute to the quality of life and efficacy at work. Each individual experiences stress differently depending upon their personality traits and coping mechanism. There mode of living is comparatively different in all aspects from one another and that is why they carried out a stressful lifestyle. The workload, personality traits, coping mechanism, workplace environment and balance between work and family mediates the individual's experience to stressful situations - all of which ultimately affects the quality of life.

The work nature of physiotherapists and occupational therapists increases the risk of musculoskeletal issues and weakness. Due to unavailability of rehabilitation equipment and

support at client's home, therapists have to adapt the awkward positions and postures that cause fatigue and pain. They usually get stressed having the patient go through too much exercise that can otherwise easily be done through equipment. Many workplaces have ergonomically altered to guarantee the specialist's well-being, yet little consideration is paid on the well-being results coming about because of work worry of home-based rehabilitation services. This investigation has shed light on the level of workload and its effect on the well-being and prosperity of rehabilitation professionals providing home-based rehabilitation services.

This study statistically shows the weak association between quality of life and burden on therapist, proving home-based rehabilitation demonstrated moderate to high burden. Thus, researches are required to identify the factors influencing quality living of therapist in Pakistan.

PUBLIC HEALTH SIGNIFICANCE

The study was helpful to investigate the risk factor that promotes burden and reduces the quality of life of rehabilitation professionals. Moreover, this research could be supportive in reducing the amount of burden in order to enhance the quality of life. Furthermore, it also addresses the need of therapists as they are prone to injury due to the nature of their work.

CONCLUSION

It is concluded that the participants had an average quality of life and increased level of burden therefore, further studies are required to address the healthcare needs of therapists working in home-based settings to reduce the level of burden and increases quality of life.

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RESEARCH REPORT

ASSESSMENT OF SENSORY PROCESSING CHARACTERISTICS IN CEREBRAL PALSY CHILDREN

ABSTRACT

AIMS & OBJECTIVES
children with cerebral palsy present with the complain of motor and sensory deficits. The movement and posture difficulties are well addressed by the rehabilitation team; however, sensory deficits remain unaddressed. Therefore, this study aims to assess the sensory processing characteristics in Spastic Diplegic children using Short Sensory Profile.

METHODOLOGY
This cross-sectional study was conducted at special education institutes/schools of Karachi. The Cerebral Palsy children with Spastic Diplegia aged 4-15 years were enrolled through Non-Probability Convenience Sampling Technique. Data was collected from parents/guardians of the participants using Short Sensory Profile questionnaire.

RESULTS
A sample of 70 participants was obtained out of 133 with a highest reported mean score of 17.38 in Tactile Sensitivity, while lowest in Taste/Smell and Movement Sensitivity i.e. 8.77 and 6.12 respectively. Moreover, a significant weak correlation was determined between Tactile and Movement Sensitivity ($p<0.05$).

CONCLUSION
It was found that all CP children enrolled in the study were showing Atypical sensory performance on Short Sensory Profile. Further investigation is required to establish psychometric properties of Short Sensory Profile on CP population and understand the correlation of sensory modulation impairments with functional performance for better intervention outcome for CP children.

KEYWORDS
Cerebral Palsy, Spastic, Diplegia, Dysfunction, Activities of Daily Living, Rehabilitation.

Mehreen Zahid
Physiotherapist
Saudia Arabia
mehreenwahaj@hotmail.com

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INTRODUCTION

Cerebral palsy is considered as one of the leading causes of physical disability in early childhood[1]. It is a group of movement and posture disorder caused due to non-progressive brain damage in early years of life; resulting in activity limitation[2]. The motor disturbances of Cerebral Palsy are often influenced by sensational abnormalities, perception, cognitive awareness, speech and behaviour[3]. Depending on the neuromuscular deficits, it is clinically classified into Spastic, Dyskinetic and Ataxic Cerebral Palsy, in which 70 to 75% accounts with spastic cases[4].

Cerebral Palsy is a prevailing variant from country to country. It has been shown to occur more in lower and middle-income countries in comparison to high-income countries[5]. The survey-based study conducted and the registered cases of Cerebral Palsy based in Europe, United States and Australia reported 1.8 to 2.3 cases/1000 live births[5]. Whereas the prevalence in Asia was found to be 3.5, 3, 2.1 per 1000 live birth in Bangladesh, India and Iran respectively.[6,7,8] However, reportedly Pakistan has less number of cases i.e. 1.2 as compared to its neighbouring countries[9].

Sensory modulation refers to physiological and neurological changes that take place in the central nervous system in order to control and classify the degree, pattern and intensity of sensory input[10].The sensory information acts as sensory stimuli that directs information and sends feedback regarding body position in space, allowing for adaptive responses to be developed[11]. Jean Ayers, proposed the theory of sensory integration (SI) that reinforces the processing of sensory awareness and information[12]. The theory centralised the idea that disruption in neural development and sensory input integration that disturbs the desirable behaviour necessitated for child development, thus the need for therapy is essential to guide sensory stimuli in order to elicit an adaptive motor response[13]. Sensory integration deficits occasionally occur with impairment in motor function, leading to motor disorders[14]. The sensory processing disorder has an adverse impact on coping habits such as feeding, sleeping and activities related to bath and bedtime. It also manifests as difficulty in acquiring skills, self-identification, and associations[15]. There is a high incidence of sensory processing impairment in children. Numbers of studies have investigated sensory integration in different population such as Autism Spectrum Disorder[16], Intellectual Development Deficits[17], Major Affective and Anxiety Disorder[18]Preterm Preschool children[19] and Preterm Infants[20]; additionally, some studies surveyed sensory processing in the healthy population[21]. A specific instrument or standardised assessment tool is required to measure sensory processing disorder that is suitable for use with children. There are studies that measured the sensory processing in Cerebral Palsy children with the help of neuroimaging equipment that is not commonly available in clinical settings. The measurement of Sensory processing disorder via a specific clinical measure is yet not common however; studies showed that a short sensory profile provides comprehensive details of sensory integration issues in children[11, 14].

Sensory profile helps in the evaluation of behaviours and the abilities associated with integration function of modulation and input of sensory afferents, directing a wide and comprehensive assessment of sensory processing disorders[22]. It offers a global assessment of how children relate with the environment and respond to multiple sensory stimuli, characterising children's outcome patterns and providing families with a practical guide to resolve sensory processing deficits[11]. Therefore, the aim of this study is to assess the sensory processing characteristics among Cerebral Palsy children. The results of this study could help therapists in providing appropriate rehabilitation plan according to the abilities of the children and their responsiveness to the environment.

METHODOLOGY

Study Design
Cross-sectional study.

Study Setting
The study was conducted at Al-Umeed Rehabilitation Association (AURA) and Imran Rehabilitation Centre (IRC), Karachi.

Target Population
Spastic Diplegic Cerebral Palsy children.

Duration Of Study
6-8 months.

Sampling Technique
Non-Probability Convenience Sampling Technique.

Sample Size
Sample size was calculated by the online software named Open Source Epidemiologic Statistics for Public Health (Open EPI) version 3.01 by considering a study conducted by Pavao S.L (2015)[23.] Considering proportion of 67.1%, 95% confidence level and 8% bound of error, the calculated sample was n =133.

Sample Selection
Inclusion Criteria
• Both male and female Spastic Diaplegic Cerebral Palsy children aged 4-15 years[23].

Exclusion Criteria
• Cerebral Palsy children with severe comorbidities and secondary disorders such as Spina Bifida, Epilepsy, Intellectual Disability, Visual Impairments etc. were excluded[23].

Data Collection Tool
Data was collected through the Short Sensory Profile (SSP) questionnaire[23], a reliable tool to assess sensory processing characteristics and the pattern of performance in children with various disability groups. The SSP is comprised of seven sections i.e. Tactile Sensitivity, Taste/Smell Sensitivity, Movement Sensitivity, Under-responsive/Seeks Sensation, Auditory Filtering, Low Energy/Weak and Visual/Auditory sensitivity, under which 38 questions are framed to assess sensory processing

characteristics on a 5-point Likert Scale consisted of 1=Always, 2=Frequently, 3=Occasionally, 4= Seldom, 5= Never. The total scoring is classified into Typical Performance (190-155), Probable Difference (154-142) and Definite Difference (141-38) respectively.

Data Collection Procedure

Data was collected from special educational settings in Karachi. Obtaining consent from parents/guardian, participants were enrolled according to the inclusion criteria. The therapists explained the questionnaire; moreover, questions were also translated into the local language to overcome language barrier issues. After ensuring the caretakers understanding, the assessment of sensory processing characteristics was performed of on SSP questionnaire. Afterwards, the therapists comprehended the total scoring in order to evaluate the sensory processing characteristics of children, and evaluated the data provided by the parents/guardians.

Data Analysis Strategy

Data was entered and analysed on IBM SPSS Statistics software version 20. Descriptive statistics was applied to calculate mean and standard deviation for numerical data whereas in inferential statistics, Spearmen/Pearson correlation was calculated in between the different items of SSP.

Ethical Considerations

Prior to data collection, informed consent was obtained from the children's parents/guardians by briefing them about the purpose and method of data collection. Furthermore, it was ascertain that all the data will remain confidential under the investigator's supervision.

RESULTS

Out of 133, 70 participants were enrolled in the study including 31 males and 39 females with mean age of 9.5±2.84 years. The results of the study revealed that all patients fall under definite difference that showed marked sensory integration impairment in the sample. The mean scores for each item on SSP is depicted in *Table-1, Figure-1*.

Table.1 Depicting Mean Scores of Participants on SSP

Items	Mean ±S.D.
Tactile Sensitivity	17.38±3.41
Taste/Smell Sensitivity	8.77±3.21
Movement Sensitivity	6.12±1.99
Under-responsive/ Seeks Sensation	16.54±4.37
Auditory Filtering	15.2±3.79
Low Energy/Weak	14.82±3.24
Visual/Auditory Sensitivity	15.52±3.24

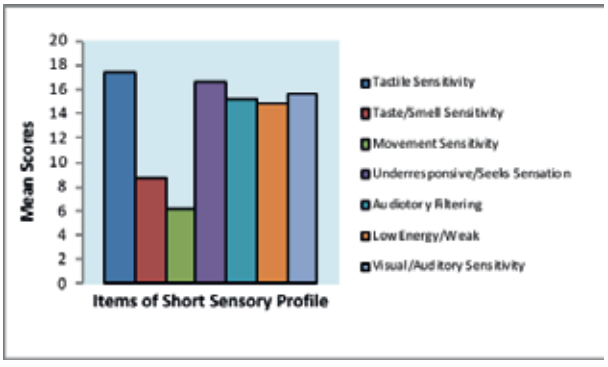

Figure.1 Illustrates mean scores of participants on SSP

Pearson and Spearman Correlation test were run between different items of SSP. Auditory Filtering and Visual/Auditory Sensitivity showed insignificant results with a weak positive correlation between the two variables (r=0.10, p=0.37) followed by Movement Sensitivity and Visual/Auditory Sensitivity correlation again showing insignificant results with a weak positive correlation (r=0.16, p=0.17). However, significant correlation was observed between Tactile Sensitivity and Movement Sensitivity but the strength of correlation was weak (r=0.26, p=0.027) *Table-2*.

Table.2 Showing Correlation of Different Items in SSP

Variables	Correlation (r)	P value (<0.05)
Auditory Filtering	0.10	0.37
Visual/Auditory Sensitivity		
Tactile Sensitivity	0.26	0.027
Movement Sensitivity		
Movement Sensitivity	0.16	0.17
Visual/Auditory Sensitivity		

DISCUSSION

The results of this study indicated variability of mean scores in items of SSP i.e. highest mean scores (17.38) was obtained on Tactile Sensitivity, (16.54) Under-responsive/Seek Sensation (15.2) Auditory Filtering, Visual/Auditory Sensitivity and (14.82) Low Energy/Weak domain. Whereas, lowest mean scores - (8.77) and (6.12) - was recorded in Taste/Smell and Movement Sensitivity components respectively. The results show the undesirable performance of the children that may serve as the indicator of sensory integration impairments.

Number of studies have indicated that disorders

such as sensory, accompanies Cerebral Palsy children, perceptual, cognitive and behavioural due to the lesions in white matter, present in almost 45% of the children[24]. Furthermore, it was advocated that sensory impairments might co-exist with motor deficits in children with developmental disabilities that may manifest as activity limitation, slow information processing and impair adaptive[25]. However, limited studies have been conducted to address the disturbances of sensory processing abilities in Cerebral Palsy children. A study conducted by Wickremasinghe et al[26]showed that 39% of the children had an overall atypical sensory profile in which tactile, auditory and vestibular processing was most likely to be affected. On the contrary, our study showed typical performances in Tactile and Visual/Auditory Sensitivity items, however weak correlation was observed (r=0.26) between these two items that might be an indicator of risk for neurodevelopment impairments in the future. The sensory modulation mediates posture control and movements in children. Input from all the six sensory receptors is integrated to form body schema and understanding of body positions in relation to space. This information is used by the brain to generate movement and correct posture according to activity and environment demands [25-26]. Thus, addressing sensory modulation difficulties should be identified and addressed at early stages. A study conducted by Lane, Molloy and Bishop[27] concluded that children of a younger age have sensory hyperactivity that may serve as an indicator of intellectual impairments in the future. Moreover, atypical sensory reactivity either hyperactive and/or hypo active may be a discriminating characteristic that might be useful in the early identification of disabilities in susceptible children. It has also been suggested that the impairments in sensory profile may manifest in differing temperaments that is highly susceptible to environmental and developmental factors of early childhood interplay[24-27]. Likewise, as our study reported hypo-sensory reactivity in Tactile and Visual/Auditory domain, thus -careful assessment and monitoring of sensory disturbance is required to understand the emergence of sensory subtypes at the time of diagnosis. Furthermore, Lane, Molloy and Bishop[27] performed model based cluster analysis to classify individuals on the type of pattern difference to evaluate most sensitive areas however; it was not possible in our study as all the participants were specified to definite difference on SSP. Nevertheless, these studies had been conducted on various disability groups of different populations, therefore; generalisability of the results may not be relevant due to socio-demographic characteristics and spectrum of questionnaire.

Our study aimed to assess the sensory processing characteristics and pattern of performance among Cerebral Palsy children with an insight that early detection may provide a strong base for sensory integration intervention, which is crucial for better development of children with Spastic Diplegia. For this purpose, SSP questionnaire was used for the screening of sensory characteristics and pattern of performance in children of 4-15 years. However, few studies were found to explore the use of SSP on Cerebral Palsy children with a similar age group. In addition to this, a study revealed that 57% children have a problem in functional abilities and sensory modulation. The sensory processing disorders were categorised into definite difference in comparison with the children who typically have a healthy performance. However, others fall in the category of the probable and typical difference. Thus, it was concluded that a strong variation in the sensory integration is associated with children having functional disabilities[28].On the other hand, a study conducted among the Saudi children with autism revealed the apparent sensory processing dysfunction through sensory profile demonstrated that 84.8% of children with autism have definite sensory processing dysfunction. The most prevalent sensory processing dysfunctions involved the Under-Responsive/Seeks Sensation (89.13%), Auditory Filtering (73.90%), and Tactile Sensitivity (60.87%) domains. These results draw the conclusion that the children have clinically significant sensory dysfunctions. Although, the prevalence of sensory dysfunctions in children with autism is significantly higher than in the children without autism, limited studies reported to assess the variable on Cerebral Palsy children[29]. Furthermore, Pollock, Metx and Barabash[30] stated that significant number of individuals with eliminating disorder were found to be associated with sensory integration problem and it was found with the help of the short sensory profile. Therefore, it is important to evaluate the sensory profile for effective treatment of the Cerebral palsy and other developmental disorders. Nevertheless, the vague outcomes and probability of false positive results of above studies focused the need of further investigation and fact of not to be dependent on the short sensory profile, merely for making effective treatment plans and measuring the true sensory capabilities of a child. Furthermore, the reliability of tools is needed to be analysed among various developmental disorders of children to strategise an effective treatment strategy. Despite the fact that several studies reported sensory issues in various disability group, the results of these studies are doubted due to differing characteristics of population and questionnaire reliability.

Strength And Limitations

To the best of the author's knowledge, this cross-sectional survey is the first to assess the sensory processing abilities in Cerebral Palsy children. In this study, a definite difference was found in Spastic Diplegic Cerebral Palsy children that is an indicator of distinct variability in sensory integration domains and susceptibility to deterioration of functional skills in the future. Moreover, SSP has shown the trend of higher scores in typically developing children in most of the items. Although assessment through SSP have explicitly not been included as diagnostic criteria in children with development disabilities, yet it is useful to predict the performance difficulties that may be associated with sensory disturbances associated with a particular disability. Moreover, one of the limitations of the study is the limited sample size. As Cerebral Palsy children were not

classified according to the GMFCS levels since during the assessment children were experiencing different stages of development, therefore wider inferences in the results may have occurred. Furthermore, a few studies have been conducted to assess the sensory processing issues while demonstrating a varying spectrum of questionnaires in which most of the sensory profiles were caregiver reported questionnaires. Therefore, the subjective nature of answers may vary due to sociocultural characteristics of the parents/guardians and children. However, this perspective is somewhat beneficial in order to rule out sensory processing issues that may lead to future investigations based on the subjective experiences of children and their families affecting their quality of life.

Future Recommendations

Further investigations are required to assess the sensory processing abilities in different age ranges and homogenous GMFCS among Cerebral Palsy children to evaluate the pattern of performance with respect to varying classifications that may exhibit interesting findings ahead. Furthermore, healthcare professionals should develop adequate knowledge of the sensory processing impairments that may indulge them in functional rehabilitation of the children, thereby adding a specific sensory stimuli to improve their independency. Moreover, future work should involve cordial relationships between therapist-client/parent for the establishment of facilitator factor child's health condition.

CONCLUSION

It is concluded that the selected participants of the study have shown atypical sensory performance on the Short Sensory Profile. The reliability and validity of Short Sensory profile is found for ASD while for CP, the psychometric properties of Short Sensory profile is yet to be established. Further studies are required to evaluate the usefulness of the questionnaire in various disability groups. Moreover, healthcare professionals should develop an adequate knowledge of the sensory processing impairments and establish cordial relationships with caregivers for functional rehabilitation of children with Cerebral Palsy.

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RESEARCH REPORT

ASSOCIATION BETWEEN SELFITIS AND MENTAL WELL-BEING AMONG ACADEMIC PROFESSIONALS OF KARACHI

ABSTRACT

BACKGROUND AND AIMS
A selfie is referred to a photograph that one has taken of oneself, typically from a smartphone or webcam, often shared on social media websites. Recent studies suggested that selfie addiction negatively affects the mental and social health of individuals. The American Psychiatric Association confirmed obsessive selfie-taking as a mental disorder. Therefore, this study aims to explore the association between selfie syndrome and mental well-being among academic professionals of Karachi.

METHODOLOGY
The cross-sectional survey was conducted on academic professionals, selected through the non-probability sampling technique. The data was collected through Selfitis Behavioural Scale and Warwick–Edinburgh Mental Well-being Scale.

RESULTS
A total number of 100 participants were included in the study with a mean age of 29±10.8 years. The findings showed that 42% to 45% of the selected sample showed severe to moderate selfitis behaviour while 13% had mild selfitis behaviour with no significant association with mental well-being.

CONCLUSION
It was concluded that the majority of individuals were suffering from moderate to severe selfitis behaviour with no significant association with mental well-being. Further studies are suggested to identify how selfitis behaviour influences the mental well-being of different age-groups in Pakistan.

Sundus Riaz Paracha
Occupational Therapist.
Dow University of health and sciences (OJHA).
sundus.riaz.paracha@hotmail.com

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KEYWORDS
Health, Function, Social, Behavior, Disorder, Syndrome.

INTRODUCTION

Selfie refers to a self-portrait picture taken from a cell phone camera[1]. Many people share their selfies on social media websites and obsessively check for others likes and dislikes[1,2]. Google statistics reported that in 2018, 93 million selfies were uploaded on social media websites per day[2]. In addition, Goffman et al[3] refers to a selfie as a form of self-presentation. According to his theory, people present themselves positively to gain the approval and attention of others; also, it is regarded as a medium of impression management through portraying one's ideal self[3]. Furthermore, social psychologists demonstrated that there are two basic social needs of a human that can be linked with the increasing trend of taking selfies, which includes the need of approval, belongingness and self-presentation[3-4]. The other two reasons of selfie popularity is easy access to cell phones, camera and increased data sharing on social network sites[4]. Last year, over 1.5 billion young individuals used smart phones and a large number of pictures were uploaded on social network sites[4-5]. In 2016, a study analysed the perception and attitude toward selfie taking on school-going population. It was concluded that 42.6% of the participants took their selfie on a daily basis with an average of 18.1% girls and 15.2% boys; taking more than four selfies a day[5].

With growing interest towards the internet, selfie-taking behaviour has become a part of an individual's life[5]. Moreover, social media applications have provided a platform for social acceptance that has led to a surge of selfie taking in recent years, affecting the individual's mental health[5,6]. Moreover, a number of studies have concluded that the urge of compulsive selfie-taking is a mental disorder[6]. It was highlighted that the selfie is not just clicking a self-portrait; it allows the person to establish its individuality and self-importance[6]. In addition, the selfie trend is gaining popularity in young adults[5,7]. According to the survey conducted in 2018, 70% of the young people aged 18-30 years preferred to take selfies while 11% took selfies everyday[7]. Furthermore, 70% of the young individuals showed high motivation of posting a selfie onto social network sites[8]. Psychological studies identified a strong association between selfie-taking behaviour and narcissistic personality traits[9].

Recent studies have demonstrated that social acceptance is an innate need of every individual[9,10]. It was reported that the continuous chain of selfie posting, responses and feedback, particularly the number of likes received, plays an important role in the perception of social acceptance in adolescents - particularly among girls[10]. With the core purpose being peer acceptance, selfies have become a popular practice of seeking attention and acceptance[10,11]. These findings showed an association of selfitis behaviour with a maladaptive personality trait such as narcissism, also self-acceptance can be linked with external validation[12]. With the recognition of the negative impact of selfies, it has now become an important area for investigation.

Selfitis is an obsessive clicking of self-portraits using a digital camera[13]. Multiple studies have highlighted strongly positive association between selfitis, narcissism, and negative correlation with self-esteem[12-13]. In addition, it may lead to a complex addiction disorder such as editing, posting and repeatedly checking the phone i.e. waiting for a response on shared pictures. In addition, selfitis is a psychological disorder comprised of three levels, which starts with board line the phase in which a selfie is taken for self-pleasure 3 times a day but not posted on social media, while the second level (acute) starts with the same number of selfies however, they are posted on social media[12]. While, the final level (chronic) is the phase of uncontrolled urges to take selfies at any time of a day and posting them on social media in order to get appraisal or attention from the surrounding[12]. People with chronic selfitis may go up to dangerous levels to click their ideal selfie – even on the cost of risking their lives[12,13]. Yet limited studies are available to indicate the levels of selfitis behaviour while its effect on different aspects of human life continues to be a trending topic for researchers, however, traits that lead to selfie taking behaviour still remains unclear. The impact of the selfie on identity production has been under investigation for over a decade, little knowledge is available on negative aspects of selfie taking behaviour on mental health of its consumers in Pakistan. Moreover, researchers are shifting their attention towards personality traits that are relatively involved in this phenomenon and how different personalities react to such behaviours[14]. A number of psychologists believe that selfitis is associated with different personality traits such as narcissism, self-orientation, peculiarity; imperiousness and self-centeredness[14,15]. Also, it may lead to other comorbidities such as eating disorders and body image dissatisfaction[13].

Taking a selfie is the representation of an ideal self[13,14]. Studies have shown that individuals have different specific ways for self-representation thus; they seek such behaviours by taking selfies and consider it a good concept to validate and express oneself[14]. Several studies have emphasised the link between self-esteem with selfie taking behaviour[12-14]. High number of selfie taking, closely relates to low self-esteem and poor self-image[14]. In 2019, a research was conducted to explore the selfie-mania influence on an adolescent's self-esteem and showed a positive correlation between selfie mania and self-esteem[15]. Another study suggested that selfitis is more likely to increase in order to seek attention, appraisal and the positive response of others and is ultimately the root cause of narcissistic behaviour[16]. On the contrary, a few studies suggested that selfies have a high influence in boosting self-confidence and self-image[17].

Despite of this fact, the extent of selfie addiction can be judged by the increasing number of deaths that occur while trying to capture the perfect portrait[18]. In 2018, incidents and death occurrences related to selfies were reported from October 2011

to November 2017, accounted for 59 deaths and 137 accidents around the world[18]. Furthermore, Pakistan was placed on the second position with nine deaths in killer-selfie incidents[19]. A number of researches tend to focus on individual factors, especially personality traits that can lead to addicted behaviour[19]. However, none of the studies have explored the effects of excessive interaction of selfie syndrome on individual lives and its impact on their well-being. Therefore, this study aims to explore the association between selfie syndrome and mental well-being among academic professionals of Karachi.

METHODOLOGY

Study Setting
Data was collected from educational institutes of Karachi.

Study Design
Cross-sectional study.

Target Population
Academic Professionals using social media ≥ 2 hours per day.

Duration of Study
6 months.

Sampling Technique
Non-Probability Convenience Sampling Technique.

Sample Size
N=100.

Sample Selection
• Inclusion Criteria
Male and female academic professionals with ≥2 years of experience and mobile phone usage with social media exposure of ≥ 2 hours per day[20].

• Exclusion Criteria
Individuals who refused to participate or do not have access to social media.

Data Collection Tool
Data will be collected on two scales, described as follows:

• The Warwick–Edinburgh Mental Well-being Scale (WEMWBS) will be used to measure mental well-being on a 14-item scale with 5 response categories ranging from 1 to 5, i.e. none of the time to all of the time, providing a total score from 14 to 70[21].

• The Selfitis Behaviour Scale (SBS) was used to identify selfie syndrome by using exploratory factor analysis comprised of environmental enhancement, social competition, attention seeking, mood modification, self-confidence, and conformity. Responses are rated on a scale of 5 point: 5 = strongly agree, 4 = Agree, 3 = Neither Agree or Disagree, 2 = Disagree, 1 = Strongly Disagree. The higher the score, the greater the likelihood of selfitis behaviour[22].

Data Collection Procedure
Participants were recruited on the basis of inclusion criteria from educational institutes of Karachi through convenience sampling technique. Prior to the data collection, all participants were provided with informed consent in order to procure detailed information about the study. Followed by the consent, participants were given Selfie Behaviour Scale (SBS) and Warwick–Edinburgh Mental Well-being Scale (WEMWBS) to evaluate the association between level of selfitis and mental well-being.

Data Analysis Strategy
Data was entered and analysed on SPSS (Statistical Package for Social Sciences). Participant's demographic details were represented through descriptive statistics through mean and standard deviation whereas, chi-square was applied to indicate association between the variables.

RESULTS

A total number of 100 participants were included in the study with mean age of 29±10.8 years. The detailed description of demographic characteristics is shown in *Table-1*.

Table.1 shows Demographic Details of Participants

No. of Participants	n= 100
Gender	Male (n=10) Female (n=90)
Age (Years)	29±10.8
Educational Level	Bachelors (49%) Masters (37%) Doctorate (14%)
Years of Experience	5.05±2.6

On WEMWBS, the average mean score was 50.37±13.5 indicated moderate level of mental well-being, while on SBS, 45% people showed moderate selfitis behaviour followed by severe selfitis behaviour which accounts for 42% while 13% of the participants showed mild behaviour *(Figurea-1)*.

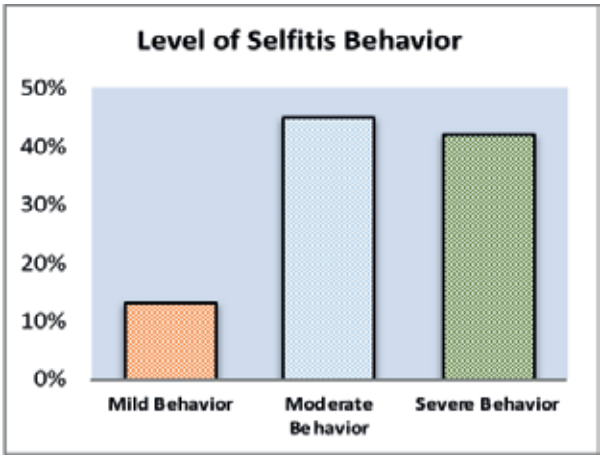

Figure.1 Shows level of Selfitis Behaviour

Moreover, no significant association was found between level of selfitis and mental well-being as depicted in *Table-2*.

Table-2 Chi-Square Test of Association

No. of Participants	n= 100
Pearson Chi -square	79.60
P-value	0.65

DISCUSSION

The findings of our study revealed that a majority of individuals were suffering from moderate to severe selfitis behaviour with no significant association with mental well-being. Several studies showed that culture diversities around the world differ as the perception and acceptance for selfies in the social arena of its users[21-23]. Moreover, some societies perceived excessive selfie taking behaviour as negative, while for others it is an important source of communication and interaction with the outside world[22]. Our study advocates that the association between selfie syndrome and health well-being has an impact not only on the social but also physical, mental, psychological, socio-economic factors of its users although limited studies have been conducted in this regard. Literature has reported that negative personality traits are associated with selfies[20]. It was also revealed that approximately 21% individuals also deleted their selfies if they do not get any likes. This indicated that people seek self-approval in the form of likes on their self-portraits[21-23]. This is also taken as an insight of how one is viewed by others and might lead to negative impressions fostered by personality developmental traits[24]. According to the studies, overall 16% people had negative experience with posted selfies on social media[22]. Moreover, it was indicated that 11% people take selfies every day, besides they may or may not post it on any social media either way due to suffering from selfitis[23]. However, these values are small but have a significant number. People seem to have genuine insight to their reputation, yet they might have achieved meta-accuracy only by capitalising on the fact that others see them similarly to how they see themselves[21].

With the evidence provided by different scientific studies, it was reported that selfies are associated with personal characteristics and is positively related to narcissism, attention-seeking behaviour, self-centered behaviour, and loneliness[21]. With evident motive to attract others, seeking attention and to increase the social network, selfie behaviour is found to be closely related to narcissism[22]. Both genders are equally involved in having highly self-reported traits of narcissism with excessive use of social media[23]. Furthermore, around 7% individuals feel unreliable in the wake of taking selfies while 16% had a negative involvement in posting selfies[24]. These findings demonstrated externalisation and narcissism among individuals. Therefore, people need adherence to a couple of safe selfie rules while snapping pictures[25].

Researches also reported that individuals with low self-esteem are more engaged in self-promoting behaviour as compared to individuals with high self-esteem[24]. Similarly, several studies show a broader area of self-esteem affected by this recurrent behaviour[23,24]. Self-esteem and self-worth are assumed to be associated with appearance. Individuals imposed their desired self-portrait to get approved by others while mainly focusing on their good characteristics[24]. These virtual images is to cater to a specific population in which people of similar interests, ideas are to be attracted.

Several studies stated that self-image has a remarkable effect on the mood and self-esteem that may lead the women towards psychological stress regarding their self-presentation[25,26]. They were more anxious, less confident, and felt less physically attractive without retouching or editing picture[26]. However, more harmful effects were found in women who could retake and retouch their selfies[25]. In addition, women are more likely to get affected by the number of likes they receive that altered their overall global state of self-expressions[26]. Therefore, it is important to identify the selfie behaviour that may influence an individual's well-being.

In addition, selfies must be viewed as a cultural artifact, not merely as the cause of psychosis or other mental disorders. It is an effective way to communicate with different communities and audiences all around the world[27]. Another study conducted by Kaur addresses the gap in relationships with well-being and body confidence[28]. Therefore, further interventions should be in general population that suggested having a negative impact on adolescents' well-being and body confidence[29]. Moreover, social health analysis should also be conducted as social media is said to be responsible for the development of psychiatry disorders such as personality disorders, addiction, voyeurism etc. Furthermore, selfie-taking addiction may also lead to tragic accidents and deaths therefore the behaviour needs to be addressed at an earliest to prevent further consequences.

Strength & Limitations

There are several limitations involved in this study, including time constraint due to which further participants couldn't be approached. Moreover, only a few males volunteered to participate in the survey thereby male gender couldn't be evaluated to the required extent. As the study was conducted in a small group, therefore results cannot be generalised. With a larger sample and different subgroups, we might have arrived at the results with different percentages for the identification of selfie syndrome. In addition, gender wise association was not explored and may serve as a research gap. Also, with regard to mental well-being, the time and condition of the participants was not investigated either which may lead to the element of response bias due to varying situations. However, according to the author, this study is one of its kinds to be

conducted in Pakistan among academic professionals considering standard and common assessment tools. The study has explored selfitis among the group that is more prone to the use of social media as per the nature of their work that may lead to adverse mental health consequences in the future.

Future Directions

As selfitis may increase in the overall population with the advent of technology, therefore, it is recommended to spread awareness among the people of all age groups, children to adults regarding selfitis and its effect on mental well-being. Health education programmes, pamphlets and posters may be helpful to create awareness about the selfie syndrome, whereas, mass-media and other communication methods could also help a lot in encouraging people to deal with their psychological disorders. Further surveys should be conducted in the population to rule out the factors involved in selfitis behaviour, moreover interventions should be given to address psychological disorders that are evolving due to such issues.

CONCLUSION

It was concluded that the majority of individuals were suffering from moderate to severe selfitis behaviour with no significant association with mental well-being. Further studies are required to assess the level of selfitis and its effect on well-being along with its influence on mental, social, physical and psychological health with standard assessment tools.

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RESEARCH REPORT

EFFECTIVENESS OF SHORT ARC AND ISOMETRIC QUADRICEPS EXERCISES ON PAIN, MUSCLE ACTIVITY AND HEALTH RELATED QUALITY OF LIFE IN PATIENTS WITH ANTERIOR KNEE PAIN

ABSTRACT

AIMS & OBJECTIVES
The aim of this study is to evaluate and compare the effects of Short-Arc and Isometric Quadriceps exercises on Quadriceps strength and health related quality of life among Anterior Knee pain patients by using EMG biofeedback.

METHODOLOGY
Total 80 participants were recruited and randomly distributed in two groups; A and B. Individuals in group A performed isometric quadriceps exercise while group B participants performed short-arc exercise for 1st, 6th and 8th week along with a home exercise programme. Pre and post treatment assessment was performed using EMG Biofeedback, VAS, and KUJALA scoring questionnaire. Statistically, data was analysed using SPSS version 20.

RESULTS
After 8 weeks, EMG Biofeedback revealed the higher effectiveness short-arc exercises with value 88.20mv ± 6.64 comparing isometric quadriceps exercises. Moreover, Wilcoxon rank test revealed statistically significant improvement in VAS score with p-value <0.05. Furthermore, KUJALA score also advocated the effectiveness of short-arc exercises with statistically significant values (p-value < 0.05).

CONCLUSION
The study concluded the effectiveness of Short-arc quadriceps exercises comparing to static-quadriceps exercises in improving muscles strength, pain and health related quality of life after 8 weeks of intervention.

KEYWORDS
Quadriceps Muscles, Vastus Lateralis, Vastus Medialis, Knee Joint, Pain, Health-Related Quality of Life.

Muhammad Shahrukh Abbasi
Assistant Professor
Ziauddin College of Rehabilitation Sciences
Ziauddin University
shahrukh.abbasi@zu.edu.pk

Syed Abid Mehdi Kazmi
Associate Professor
Dr. Ziauddin Hospital
syedabidmehdi@gmail.com

Nabeel Baig
Assistant Professor
Ziauddin College of Rehabilitation Sciences Ziauddin University
baig.nabeel@zu.edu.pk

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INTRODUCTION

Anterior Knee pain is considered as one of the common problems dealt by the clinicians in the outpatient department with an estimated prevalence of around 15-45%[1]. Moreover, 11-17% of both physically active and sedentary individuals are suffering from anterior knee pain, especially adolescents where almost 50% of individuals continue to complain about knee pain for almost a year, subsequently affecting their quality of life and academic performance[2]. Interestingly, female gender is four times more prevalent as compared to males ultimately leading to degeneration of joint and an increase in Q-angle[3]. Patellofemoral Pain (PFP) is generally felt in front of the knee, associated with activities such as ascending and descending stairs, squatting and other similar activities[4]. Even though conservative medical treatment is found to be a first line of choice among people, yet physical therapy interventions and exercises turn out to be vital to maximise the chances of recovery[5]. According to research conducted by the US NAVY, anterior knee pain is a common problem in adolescents and in adults. The prevalence of this disorder among young adults varies from 7% to 15% in adults and it also constitutes 5% of all injuries and 25% of knee injuries. It is more common in females than males[6]. Isometric quadriceps exercises have a greater impact on decreasing the level of pain, enhancing muscle activity and increasing the functional status of knee pain patients[7], whereas the short arc quadriceps exercises enhance the health related quality of life by decreasing the level of Patellofemoral pain, strengthen quadriceps muscle more effectively and efficiently[8].

According to the studies, about half of the adult population complains of knee pain and incurred substantial cost in the healthcare system. One out of every six individuals have a medical appointment annually, out of which one-third may develop a disability[9]. The parameters of assessment includes Visual Analog Scale, Kujala Scoring Questionnaire and EMG Biofeedback[9]. EMG biofeedback machines have a potential benefit for both clinician and patients during muscle retraining programmes, the results obtained from EMG biofeedback during rehabilitation appears promising, though less researches have been done in this regard.[9] Frequency parameters of EMG Biofeedback in Patellofemoral pain presented greater reliability, diagnostic accuracy and is a useful tool to diagnose individuals with Patellofemoral pain syndrome[10]. To measure pain intensity, the comparable tools are Verbal Rating Scale (VRS) and Numerical Rating Scale (NRS). Reliability was analysed in subgroups of 250 patients after an hour, statistical analysis present high reliability and validity ($r>0.8$; $p< 0.01$) for all tools, also the mean values of all scales present a higher association. In results, it shows high reliability and concurrent validity for VAS, NRS and VRS[11]. The visual analogue scale is a reliable tool for measuring pain in adults with MSK, Orthopedics and in Geriatric groups. Parameters of reliability were measured using interclass correlation coefficient (ICC) and validity measured using Bland-Altman graphs and correlations[12]. Kujala scoring questionnaire is a reliable assessment tool for Patellofemoral pain syndrome to assess the health related quality of life[13].

METHODOLOGY

Study Setting
The study was conducted in Department of Rehabilitation Sciences Ziauddin Hospital, Clifton, Karachi.

Target Population
Patients suffering with Anterior Knee Pain.

Study Design
Randomised Control Trial.

Sample Selection
Simple Random Sampling Technique.

Selection Of Patients
• Inclusion Criteria
The patients aged between 16-40 years was with Anterior Knee Pain referred to department of Rehabilitation Sciences.

• Exclusion Criteria
Those patients with recent surgery in the hip, knee and back, history of skin infection, positive instability test indicative of ligamentous tear, metal allergy, and positive meniscal tear test were excluded from the study.

Moreover, presence of bilateral Knee pain, recurrent patellar subluxation or dislocation, previous surgery to the knee joint, patient's with referred pain to the knee, non-compliance, osteoporosis, and those with the inability to perform the prescribed exercises were also excluded.

Data Collection Procedure
The participants recruited in the study were divided into two groups A (n=40) and B (n=40). Group A received Isometric Quadriceps exercises whereas Group B received Short arc quadriceps exercises. Each group received interventions for one week under the supervision of expert physical therapists including traditional physical therapy (hot packs, cold packs, and electrotherapy). Moreover, the exercise regime was followed by 7 weeks of a home exercise programme and a weekly visit to the physiotherapy department for assessment was mandatory to ensure that recommended exercises are not increasing the pain or worsening the condition. A total 8 weeks of exercise therapy programme and assessments using EMG biofeedback, Kujala Scoring Questionnaire and Visual Analogue Scale (VAS) were performed.

Group-A: Isometric Quadriceps Exercises
Group-A received Isometric Quadriceps exercise for 8 weeks (at least 1 session/week under the supervision of a physiotherapist) and regular home-based programme. The frequency of sets of 10 repetitions; with an initial dosage: 1 set of exercise performed twice a day for the 1st week.

For advance training, 2 sets with 10 repetitions per set, twice a day for 2nd and 3rd week followed by 3 sets with 10 repetitions per set, twice a day till 4th to 8th week. The patient was advised to lie in a supine position where the towel is to be placed under the knee joint. A towel is then compressed by applying downwards pressure on knee joint without elevating foot.

Group-B: Short Arc Exercises

Group-B received short arc Quadriceps exercise for 8 weeks for at least 1 session per week under the supervision of a physiotherapist and regular home exercise. The initial dosage was 3 sets with 10 repetitions per set for first three weeks. In the advance training, 3 sets with 20 repetitions per set from 3rd to 8 weeks. Patient was in supine lying position where a bolster was placed under the knee joint. Patient was asked to lift the heels keeping knee extended and ankle is in dorsiflexion while pressing the pillow. Position was to be maintained for 3 to 5 seconds, and then slowly returned to the starting point.

The pre and the post assessment of pain, muscle activity and health related quality of life of the participants recruited in this study was assessed by using Visual Analog Scale, EMG biofeedback and KUJALA assessment form respectively.

RESULTS

A total of 80 patients included in the study were divided into two groups (n=40). The demographic details including age and gender were recorded where majority of females were included in both the groups (Group A: n=35, Group B: n=38). The mean age of the participants in group A and B was found to be 29.47±6.16 and 31.46±7.47 respectively.

Repeated Measures Analysis of Variance was applied to determine the with-in group analysis at baseline, 6th week and 8th week (*Table: 1*). Improvement was observed both in group A and B, although the mean difference was found to be significant in groups.

Within the group analysis of the effects of both short arc and isometric quadriceps on EMG of the patients were determined at 95% of Confidence Interval. The normality of the data was identified using Skweness and kurtosis test that confirmed the data is found to be normally distributed. The results revealed that the average mean value of EMG of the participants of Group A (short arc) at Baseline was found to be 6.85± 0.43 that improved at week 6, 9.8±0.46 whereas, improvement was further continued till the 8th Week 11.6±0.46 (*Table-2)*.

The results of Group B (i.e.) Isometric quadriceps exercises also improved till 8th week. However the average mean value of EMG of the participants of Group B at Baseline was found to be 6.2±0.2 that improved at week 6.8±0.3 whereas improvement was further continued till the 8th Week 7.0±0.3. *Table 3.*

Table:-1 Show the baseline and post exercise mean values of EMG in both group A and B

	SHORT ARC EXERCISES (A)			ISOMETIC QUADS EXERCISES (B)		
	Baseline	Wk. 6th	Wk. 8th	Baseline e	Wk. 6th	Wk. 8th
Mean ± S.D.	6.85 ± 0.43	9.8± 0.46	11.6 ±0.46	6.2± 0.2	6.8± 0.3	7.0± 0.3
95% CI	5.97 to 7.73	8.89 to 10.75	10.72 to 12.61	5.68 To 6.85	6.19 to 7.4	6.40 to 7.68
P-value		<0.05			<0.05	

Table-2 Shows the mean difference of EMG in both groups

Groups	N	Mean ±S.D.	Mean Diff	95% of CI	p value
Group A (Short Arc Exercises)	40	11.6 ±2.9	4.625	3.50 to 5.74	P<0.0001
Group B (Isometric Quadriceps Exercises)	40	7.04 ± 4.0			

Table-3 Shows the values of pre and post data of isometric quadriceps exercises on KAS

Groups	N	Baseline	Wk. 6th	Wk. 8th	F-Ratio	P-value
Group A (Short Arc Exercises)	40	5.500	2.000	1.000	805.3	.00001
Group B (Isometric Quadriceps Exercises)	40	6.000	5.000	3.000	123.94	

Wilcoxon Rank Test

The values of Wilcoxon rank test shows that after comparing the values for the 8th week, there will be a marked decrease of pain level as compared to isometric quadriceps exercises isolating the p-value which is p<0.0001 for both the exercises. The lowest value for pain is 0 and the highest value for 8th week shows a marked decrease in level of pain for short arc exercises than isometric quadriceps exercises which is for short arc level of pain recorded was (4) and for isometric exercises the highest level of pain for week 8 was (8) which shows the effectiveness of short arc quadriceps exercises as compared to isometric quadriceps exercises.

Friedman Test

Whereas, the values of median from baseline to 8th week are markedly decreased for short arc exercises as compared to isometric quadriceps exercises, also Friedman test showed that the value of the F-Ratio is increased for short arc quadriceps exercises with p value (P < 0.0001) hence, the efficacy of short arc quadriceps exercises for pain relief is greater than isometric quadriceps exercises. Kujala assessment score was used to identify the

activity of patients suffering with Anterior knee pain. The form consists of 13 questions and each question consists of a minimum value of (0) and maximum value of (10). The total score of this form is 100. By compiling the score of all 13 questions, forty individuals n=40 were enrolled for the assessment of pre and post exercise plan for both groups i.e. (Isometric and Short arc quadriceps exercise group). The assessment includes the first day i.e. week 1st and post assessment was done at the last week (i.e.) 8th week.

The distribution chart shows that the highest value of pre data is 83, 84 whereas the highest value of post data is 85 for isometric quadriceps exercises. For short arc exercises the highest value of pre data is 84 whereas the highest value for post data is 95. *Table-4*.

Comparision Of Pre And Post Isometric Exercises

Table.4 Group A : Isometic Quads Exercises		
n=40	**Pre exercise**	**Post exercise**
Mean ± SD	80.20 ± 7.03	82.0750 ± 7.12
95% CI	77.95 to 82.45	79.7958 to 84.3542
Mean difference	1.8750	
95% CI	1.2387 to 2.5113	
Two-tailed Probability	P < 0.0001	

The results of Group A after applying paired t-test i.e. Isometric Quadriceps exercises shows the improvement of mean and SD of post exercise i.e. 82.0750 ± 7.1266 with two tailed probability of P<0.0001.Table-4.

COMPARISION OF PRE AND POST SHORT ARC QUADRICEP EXERCISES

The results of Group B after applying paired t-test i.e. short arc Quadriceps exercises shows the improvement of mean and SD of post exercise i.e. 88.20+ 6.64 with two tailed probability of P<0.0001.

POST EXERCISE COMPARISION OF ISOMETRIC AND SHORT ARC QUADRICEP EXERCISES

After comparing the results of both groups the Mean±S.D is higher (88.20+ 6.64) for Group B (Short arc quadricep exercises than Group A (Isometric exercises) (82.07±7.12) with constant mean difference for both exercises i.e. 6.12, 95 % C.I=3.05 to 9.19 with probability<0.05.

DISCUSSION

The results of the study revealed that short arc quadriceps exercises have a beneficial effect in patients with Anterior Knee Pain N=(40). The results of this study demonstrated that Short arc quadriceps exercises brought significant improvements on all parameters than isometric quadriceps exercise after the 8-week training programme.

The results of our study showed that short arc quadriceps exercises have significant impact on pain, muscle activity and HRQoL in comparison with isometric exercises in reducing anterior knee pain. A study conducted by Earl et al showed greater reduction in level of pain. The pain was reduced significantly (Pre mean: 40.6±18 to post mean: 5±7. In this research we focused on HRQoL, muscle activity and reducing level of pain. Focus on the study, comparison of short arc and isometric quadriceps exercises shows that the Short arc quadriceps exercises brought significant improvements on all parameters than isometric quadriceps exercise after the 8-weeks training programme. In the current study VAS Scale (numerical) is used to measure pain, whereas in the research of Earl et al, pain was also measured via Numerical Rating Scale, knee abductor muscle should be focused to strengthen instead of knee extensor muscle[14]. Study on quasi-randomised trials evaluating the effect of exercise therapy on pain, function and recovery in adolescents and adults with patellofemoral pain syndrome. Researcher used vas numerical rating scale (0-10) to evaluate the level of pain and suggested that the pain decreased not only in short term of exercise therapy, but after long term of functional exercise therapy which includes strength exercises such as isokinetic, open and closed kinetic exercises on the knee joint with mean and S.D (0.99±1.84). Similar to our study NRS numerical rating scale is used to measure the level of decreasing pain with time and the most decrease in pain was found at eight weeks of short arc quadricep exercises with 95% C.I (0-2) and P-value <0.005[15].

Only statistical significant improvements brought about by the strengthening exercises was in the mental aspect of the SF-12 questionnaire. The main difference between the study by Foley et al and the present study was the shorter duration of the intervention, which consisted of eight weeks and shorter duration of session. Whereas, in the current study, KUJALA assessment questionnaire was used instead of the SF-12 Questionnaire. However, both studies performed rehabilitation protocols. EMG Biofeedback used as an assessment protocol for the study. Biofeedback mechanism system identifies the efficiency of the muscle[16]. The efficacy of EMG biofeedback on vastusmedialis and vastus lateralis muscle, similarly in this study the referenced muscle was vastusmedialis. Briani in his study performed exercises in a sitting position, whereas in the current study, exercises have been performed in a supine lying position[17].

In the current study, short arc quadriceps exercises are more efficient to produce strength and enhance health related quality of life (HRQoL) with pain relief. A study was conducted to identify the effect of short arc quadriceps exercises with or without EMG Biofeedback mechanism and proved that exercise with EMG biofeedback increased the efficiency of muscle than exercises without usage of EMG Biofeedback[18,19].

The quadriceps exercises on knee joint also has an effect on the adjacent joints like hip and knee by producing the particular group of exercises. It not only produces strength in the knee joint, but also enhances the efficiency of the hip joint and reduces the level of pain[20-23]. Vastus medialis and vastus lateralis, both muscles are involved in the alignment of the knee cap (patella) and isometric contractions of the quadriceps muscle group can produce a great impact of the strength on knee dynamic stability[24,25].

CONCLUSION

After comparing the results, it has been concluded that the values of short arc exercises shows greater muscle activity on EMG Biofeedback and reduction of pain (Visual Analog Scale) as compared to isometric quadricep exercises. The values of KUJALA assessment form after applying paired and independent t-test shows that the effectiveness of short arc quadriceps exercises are more effective to improve Activities of daily livings (ADLs). Hence, short arc quadriceps exercises are more effective to reduce pain, increase muscular activity and improve health related quality of life.

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SPECIAL REPORT

BODY COMPOSITION ANALYSIS; A SURGE IN DEMAND FOR SPORTS REHABILITATION

ABSTRACT

This special report aims to highlight the role and practice of Body Composition Analysis in sports rehabilitation to enhance athletic performance by studying its various aspects such as fat mass, lean mass, and water content in the body.

This report identified Inbody 770 as the ideal gadget for Body Composition Analysis. Fat mass analysis revealed that Body Mass Index is not an appropriate tool to determine the levels of obesity as it does not differentiate between fat mass and muscle mass, rather categorises a healthy muscular individual as obese. Furthermore, Body Composition Analysis enables to investigate the proportions of muscle mass and fat mass in a specific region as well as perform comparison analysis to identify the region of weakness and potential risk of injury. Water analysis helps to identify the cause of edema and proportions of intracellular and extracellular fluids.

Irfan Niazi
Director
AAIR Medical(Rawalpindi)
Irfan.niazi99@gmail.com

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KEYWORDS
Body Composition, Composition Analysis, Fat Mass, Lean Mass, Sports Rehabilitation, Athlete Performance.

INTRODUCTION

The term body composition refers to the amount and distribution of fat, muscle and other constituents; and associated with clinical and laboratory outcomes, normal individuals as well as in medical and surgical conditions like malignancy, cardiovascular disorders and post-operative conditions[1-6]. However, the understanding related to its significance and impact is scarcely present among the masses[7]. Therefore, the aim of this report is to highlight the impact and importance of Body Composition Analysis.

Body Composition Analysis

The human body is composed of four main constituents namely; Body Water, Proteins Mass, Minerals and Muscles Mass. Body Composition Analysis provides detailed information related to these mentioned body constituents with various aspects and features. Moreover, a variety of terminologies are used in order to improvise data related to human body constituents such as total body water, soft lean mass, fat free mass, weight etc.

Body Composition Analysis Equipment

The ideal equipment for measuring Body Composition is Inbody 770. It may produce Body composition analysis report in approximately 1 minute. The report is usually printed on an A4 size sheet and recorded with reference to ID, height, age and gender.

Basic Terminologies

Total Body Water

As we all know, we have two types of fluid in the body i.e. intracellular water and Extracellular water. First one is inside our cells while the latter is outside our cells. For the normal healthy population, the ratio between ICW and EXW is 62 and 38[8]. This ratio is for the normal healthy population. For edema patients or elderly population, this ratio is imbalanced and we can get the ratio by Body Composition Analyzer 770.

Soft Lean Mass

By adding protein over total body water, we have Soft Lean Mass also known as muscle. Soft Lean Mass consists of total body water and protein. Most people will think that our muscle is a chunk of protein but actually our muscle has protein as well as water.

Fat Lean Mass

Fat free mass can be obtained by adding minerals. It's everything except fat. So fat free mass contains total body water, protein and minerals.

MATERIALS AND METHOD

Muscle Fat Analysis

There are three parameters of Fat analysis of weight, Skeleton Muscle Mass (SMM) and Body Fat Mass (BFM). This can be found in the Inbody Result Sheet. Moreover, it also enables to draw a line that connects the tips of each bar that transform into shapes such as C shape, I shape and D shape that indicate **Cautious, Ideal and Developed** respectively. 'Cautious' specify low muscle and high fat mass that could be associated either with sarcopenia or skinny obese bodies. Contrarily, 'developed' identifies high muscle concentration than fat that is related to the athletic people presenting with muscular body type. This helps the practitioner to determine our patient/client body pattern as shown in the figure.

Obesity Analysis

Nowadays, Body Mass Index (BMI) is widely accepted and practiced as the measure of obesity. However, recent researches demonstrated that BMI is not based upon 2 parameters i.e. body weight and height and is not reliable. In addition to this, BMI fails to differentiate between the higher fat mass and muscle mass. This difference is also profoundly demonstrated by Inbody 770 through calculating body fat percentage as shown in *Figure 1*.

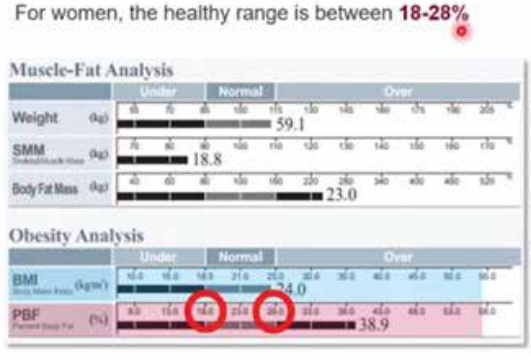

Figure 1: Shows fat mass analysis

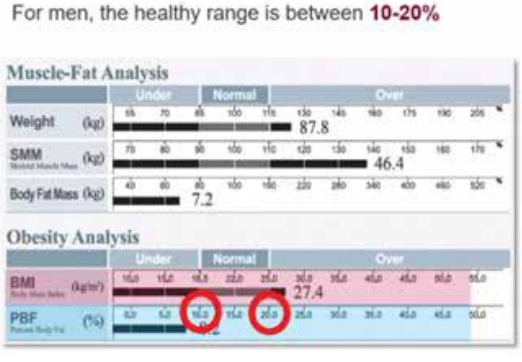

Figure 2: Shows Muscles mass analysis

Another important aspect is the amount of visceral fat and subcutaneous fat. This ratio can be studied under Inbody 770 in graphical form. According to the researches, presence of visceral fat above 100 cm increases the risk of Diabetes, hypertension and cardiovascular diseases.

Muscle Mass Analysis

It provides muscle mass percentile as well as the Muscle Mass distribution in two bars - Upper Bar and Lower Bar. This helps to identify if muscle mass is adequate enough to support body weight 100% muscle mass is enough to support body weight.

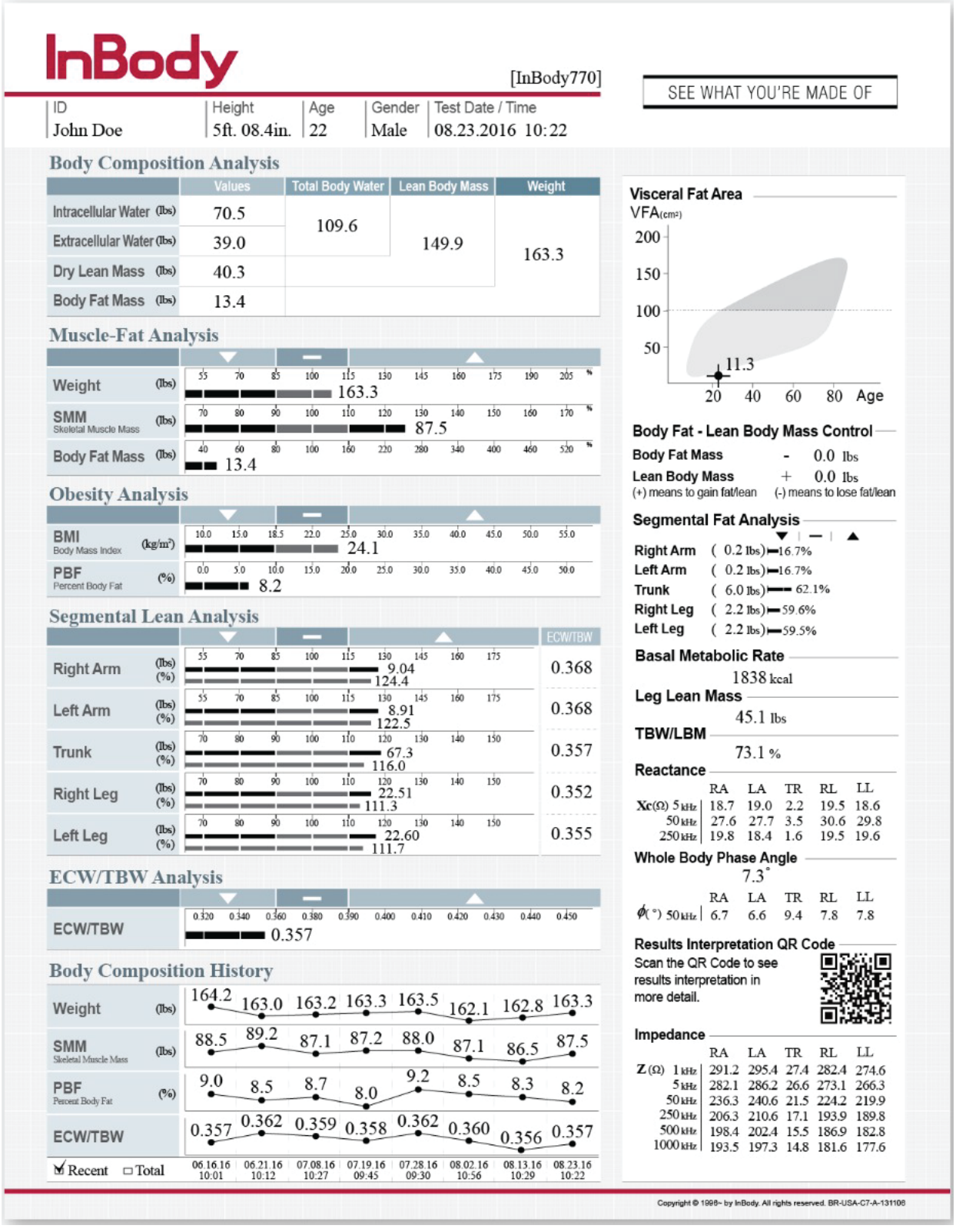

Figure 3: Water Analysis

However, below 100% is required to develop more muscles for current weight. Moreover, normal ranges for arms are 80 to 120 per cent while for legs these ranges estimate up to 90 to 110 per cent. Normally, our legs are more developed compared to the arms. Therefore, lack of muscles in legs may lead to knee or ankle related injuries. The muscle analysis of a real patient with diabetes showed that he lacks muscle mass in the lower body parts as shown in the figure[9].

Actually, muscles are a major site of glucose storage. Therefore, glucose stored in muscles and lower extremity has more muscle mass. However, if a person is having less muscle mass in lower limbs, the capacity of glucose storage and utility will decrease resulting in higher blood glucose levels. Hence, this was the reason his results showed to have more subcutaneous as well as visceral fat. Furthermore, muscles imbalances are also noticed such as; slight Imbalance of 1-2 bar difference between arms and legs, 6-10% difference between arms and slight imbalance of 3-5 % between legs. Eventually, this also helps to predict the potential risk of injury in any specific limb.

Water Analysis

Water analysis helps to evaluate the content and amount of water stored in the human body as well as its distribution into intracellular and extracellular fluid contents. Therefore, this system enables us to provide a direction to frame provisional diagnosis for various conditions such as edema, inflammation or muscle soreness etc. and also helps to provide insight of different stages of injury such as before injury, injury stage and recovery stage as in the figure below.

DISCUSSION

The importance of body composition analysis has been discussed above. This is now evident that body composition analysis can produce a drastic change in the field of sports rehabilitation by means of better assessment, examination, analysis, prognosis and selection of treatment outcome. Moreover, the ability to predict potential risk of muscular injury as areas of weakness in muscle, ligament, tendons and bone; may tremendously change the approach of practice into more exclusive, target and scientific methods. However, the practical implication of this approach is still very limited and practitioners are scarcely aware of these developments. A meta-analysis conducted recently, indicated significance of body composition analysis as a clinically useful tool for esophageal cancer[10]. Another study conducted in 2017 specifically discussed the validity of a software body composition analysis[11]. There is an inevitable need to conduct more studies in order to find valid applications for various conditions.

CONCLUSION

This report shows the evidence that Body Composition Analysis may be used as a diagnostic as well as prognostic modality for the field of sports rehabilitation to enhance athletic performance and to prevent potential risk of injury and dehydration.

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PAKISTAN JOURNAL OF
REHABILITATION

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7) Keywords

After the abstract 6-8 keywords are appreciated. These words should be Medical Subject Heading (MeSH) and reflect the topic of the article.

8) Introduction

It should briefly describe the study moving from a broad perspective to a narrow one. It should include background and literature reviews regarding the topic. Relevant references are appreciated. Always remember to mention the purpose of the study. Clearly mention the objectives of the study. Provide operational definitions of terminologies where required.

9) Methodology

Mention all the components of methodology including study design, study settings, duration, sampling method, inclusion and exclusion criteria and apparatus/tools/intervention. Mention clearly the procedure and the follow-up of the study. Always mention the implemented statistical test and the reasons of application.
Questionnaires
When mentioning the questionnaire, the format of survey and the questions included in the questionnaire should be given.

10) Ethical Concerns

Approvals are required from the Ethics Committee of the Board of the Universities or Hospitals or the place where the data is collected. Ensure that the anonymity of the participants should be maintained. Personal information is not appreciated.

11) Results

Present the results in logical sequence in the text as well as tables. Results should be specific and interpret all variables providing the evidence of the study.

12) Outcome Measures

The primary as well as secondary outcome measures should be given, including the details of the validity and reliability.

13) Discussion

Start the discussion with the summary of major findings. Relate the study with previous researches by giving comprehensive review of literature and show results favorable/contrast with previous work. Always mention the drop outs of the study as well as outliers found.

14) Conclusion

It should highlight the essential points learned from the study in a summarised paragraph including 3-4 sentences.

15) Acknowledgement

It should include the expression of thanks and a token of appreciation to any organisation or personnel.

16) References

It should be numbered consecutively throughout the article beginning with 1 for the first-cited reference. All references are appreciated in Vancouver Style. It should be listed at the end of the paper in order in which they appear in text (not listed alphabetically by author and numbered as previously).

Author Surname initials. Title of article. Title of Journal abbreviated. Date of Publication; Volume number (Issue Number): Page Numbers.

For example:

[1] Alam JM, Farooqui SI, Hussain A, Mahmood SR. Correlation of creatine kinase and myoglobin concentrations in patients suffering from debilitated conditions related to myopathies. Pak. j. rehabil. 2012;1(1):13-17