

ORIGINAL ARTICLE**THE IMPACT OF INTERNET-ENABLED PHONES ON PHYSICAL ACTIVITY AMONG STUDENTS OF TERTIARY INSTITUTIONS****ABSTRACT****BACKGROUND AND AIMS**

Smart phones usage is rapidly progressing day by day in young adults' lives who have become habituated and less indulged in physical activities. Thus, this study is aimed to measure the impact of internet-enabled smart phones on physical activity of students.

METHODOLOGY

An online cross-sectional survey was conducted among students aged 18-30 years studying in tertiary institutions. Internet-Connectedness Index and International Physical Activity Questionnaire-Short Form were formulated in the Google Docs and distributed to participants via email or social media applications.

RESULTS

A total number of 252 students participated in study revealed that majority of users have own computer for prolonged time with broadband and 3G internet. Only (4.4%) participants have performed vigorous and (5.6%) moderate activities 7 days a week. Whereas (27.8%) participants spent their time sitting at desk, visiting friends, reading, sitting or lying down to watch TV for <2 hours (27.8%), <4 hours (21.8%) while >8 hours (23%) respectively. This showed that with the increased use of internet, young adults performed low physical activity.

CONCLUSION

It was concluded that majority of young adults have used internet for prolonged time on computer/laptop/cell phones whereas limited participants reported to have regular physical activity however, no significant association was found between the impacts of internet-connectedness with physical activity.

KEYWORDS

Internet, Information Technology, Physical Activity, Activities of Daily Living, Mobile Phones, Young Adults

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INTRODUCTION

The 20th century may be recalled for its exponential development of information and innovation as modernization is associated with data, although there is a growing opinion that people's capacity to handle data and think critically leads them to their future victory regarding any particular program¹⁻². This revolution is brought about by the innovation, known as information technology that is considered to interconnect through machinery as compared to reading, writing, and communication in comparison to past decades³⁻⁴. Internet is a series of connections around the globe; millions of computers are linked together at the same time⁵. There is billions of information to share around worldwide that is shared with just one click⁴⁻⁵. In addition to it, the development of internet technology has increased day by day due to modernized and refined enhancement leads to having not only a good impact on users but also harm users, specifically students⁶. The students tend to become more and more habituated and less supportive in educational activities even in physical actions⁷. Besides, the improvement in web innovation is progressing day by day, that is modernized and refined effect on clients but moreover have an impact that's not great for clients, particularly among understudies, they become increasingly habituated and less supporting in instructive exercises indeed in physical activities⁸. The timely utilization of the internet in areas such as online education, gatherings, and counseling, etc. can offer assistance to advance self-adequacy, mental strengthening, deep-rooted learning, as well as restoration⁹. Web or internet is characterized to connect all existing computer organizations within the world constitutes of an intranet, wide-region or personal area arranges, etc¹⁰. Besides, all computer-associated-gadgets that include smartphone, tablet, switches/routers or any other interfacing gadgets into a single connect via computer systems¹⁰. The time went through utilizing email and surfing online has expanded significantly in recent decades. However, the different sorts of web utilization have been associated with positive and negative impacts such that the like shopping, playing diversions, doing inquiry about or conclude¹¹.

Internet is one of the predominant variables which influence scholastic execution and social life¹². In the recent era, the progressively far-reaching utilization of the web is occurring in numerous nations even though people tend to perform exceptionally profitable¹³. However, compulsive web utilization can be a bad influence on life, work, and family¹²⁻¹³. Similarly, on the off chance that a child feels more comfortable online than with companions within the genuine world. Otherwise, an individual cannot abstain from playing recreations online or open the smart phone, thus it is conceivable that children have already done using the web much¹²⁻¹³.

Despite, the suitable utilization of the web in zones such as online forum, news, directing etc. can offer assistance to advance self-adequacy, lifelong learning and restoration¹⁴.

A survey conducted in 2016 explored the internet-connectedness among young adults found that the internet was one major using resource. Moreover, upon investigation web utilization for social media was found to be 68.33% who used continuously, 41.67% regularly, 17% for online games, and 41.67% habitually utilize the web for online diversions. Surprisingly, 51.67% continuously utilize the web to observe YouTube¹⁵. Consecutively, children's use of gadgets such as smartphones, the tablet has grown substantially within the past decade. However, concerns existed for intemperate utilization and the impact on children's well-being amid childhood and puberty. Several studies ponder distinguished conclusions on portable device use and after wellbeing concerns in children that may lead to musculoskeletal outcomes and migraine¹⁶. Thus, number of studies is required to be conducted to determine the usage of varying gadgets and its impact on physical, mental and social well-being of the youth. With the advancements in technology, the cell phone is one of the foremost rapidly growing within the world¹⁷. Despite, today's use of a mobile phone can be compared with a computer as the modern mobile phone has all the facilities that a computer had, moreover mobile phone usage is taking a replacement to a computer due to its small size, lightweight, and can operate with minimum power¹⁸. However, the disadvantages of using mobile phones may lead to addiction-like behavior, unhealthy lifestyle, poor sleeping habits, headache, and less physical movements that may lead to psychological problems that are mostly among teenagers. However, with all of the above circumstances, the misuse of the internet cannot be neglected¹⁹. With the advent of time, humans have foremost expanded, advanced, and imaginative due to implied communication, which is made conceivable due to more complex neurophysiological mechanisms²⁰. Among all, children are the quickest developing populace with frequently centered on web i.e. 11% of 3-4-year-olds are as of now web clients²¹. In recent a long time, the expanded notoriety of cell phones has pulled into consideration as teenagers say phones make their lives more secure and more helpful. However, they too cite modern tensions connected to cell phone utilization²². In particular, higher smartphone utilization among college students is still understudied²³ as self-reported indications such as migraine, headache, troubles in concentration, memory changes, sleep disturbances. The utilization of innovation is a worldwide basic because of its commitments to human life and has improved the financial relations all around the world. Remote correspondence has arisen as one of the quickest diffusing media on earth, fuelling a

developing a versatile youth culture. Subsequently, expanded fame of cell and mobile phones in late years has drawn in research consideration. Mobile phones are viewed as a blended gift. Teenagers say telephones make their lives more secure and more advantageous. However, they likewise refer to new pressures associated with wireless elated to long time presentation per day²⁴. As PDAs have gotten more accessible, they are progressively possessed and utilized by teenagers. Further, as handsets become more stacked with capacities going from video recording and sharing, to music playing and web access, youngsters and youthful grown-ups have a consistently expanding collection of utilization. Surely, we are moving into a period when cell phones are not only for talking what's more, messaging, however can likewise get to the web and all it has to bring to the table²⁵. On the other hand, physical health of youth may be considered to be predominantly affected therefore further trials should be conducted in this regard to evaluate the internet-connectedness impact on youth. Thus, this study is aimed to measure the impact of internet-enabled smart phones on physical activity level of students.

METHODOLOGY

A cross-sectional survey was conducted at public and private tertiary institutions of Karachi, Pakistan from August to October 2020. Non-probability convenience sampling approach was used to recruit participants for an online survey on the basis of following inclusion criteria:

Inclusion Criteria

Young male and female students aged 18 to 30 years, currently studying in tertiary institutions for >1 year having access to internet-enabled smart phones.

Exclusion Criteria

Students who refused to participate or filled incomplete questionnaire.

Sample Size

n=252

Data Collection Tools

ICI: Internet-Connectedness Index was used to assess the usage of internet on technology-enabled smart phones on dimensions of history, context, scope, intensity and centrality on the scale of Yes/No, Agree/Disagree options.

SF-IPAQ

International Physical Activity Questionnaire-Short Form is a self-administered questionnaire consisted of 7-items to estimate the intensity of physical activity on total METs-min/week and time spent sitting.

Data Collection Procedure

Online questionnaire was designed on Google

Docs distributed through e-mail and several social media groups (Facebook, WhatsApp, Instagram and Twitter). All participants were also provided with informed consent to have clear understanding about the study. Subsequent to the consent, participants were asked to fill both the questionnaires to evaluate their usage of internet and level of physical activity. Afterwards, the responses were recorded and analyzed.

Data Analysis Strategy

Data was analyzed on IBM Statistics Software version 20. The demographic features and responses of participants were represented through frequency, mean and standard deviation. Chi-square Test of Association was used to determine the impact of internet-enabled phones on physical activity of students.

Ethical Considerations

Informed voluntary consent was taken online from all the participants while their information was kept anonymous under principal investigator's supervision.

RESULTS

A total number of 252 students participated in the study comprised of 48 (19.1%) males and 203 females (80.9%) with mean age of 23.4±4.1 from which highest number of responses attained from age range of 18-22 years (53.4%). On ICI, it was showed that majority of users 72 (28.6%) have own computer for 7 years or more followed by 3 to 6 years (25.4%) with (81%) have broadband access to internet and (70.2%) has 3G access, although (65.1%) haven't accessed the internet at organization, public library or cyber café for their personal use in last three months. Moreover, (31%) participants were agreed that internet helped them to stay on top events or groups, expressing themselves, accomplishing business or financial work tasks and making new friends as illustrated in Figure-1.

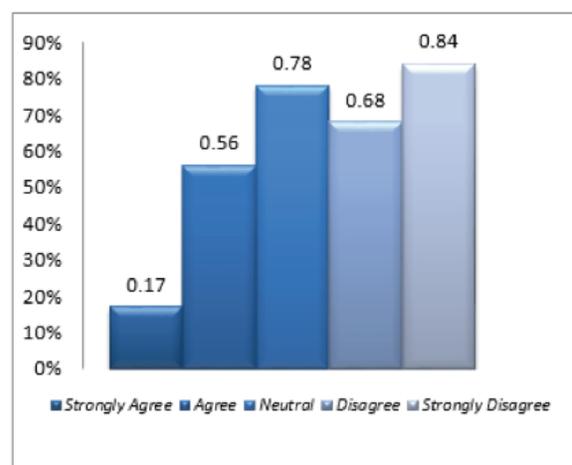


Figure-1 shows responses of participants of how internet has helped them in achieving life goals

Majority of participants 140 (55.6%) reported that they would extremely miss the use of computer and internet if they found it unavailable. Furthermore, only (6.3%) reported of very positive and somewhat positive (21.8%) response on the effect of internet-connectedness on their lives. Also, majority of students have reported to use chat rooms, Facebook, movies, online games, shopping, and web surf besides e-mail as depicted in Figure-2.

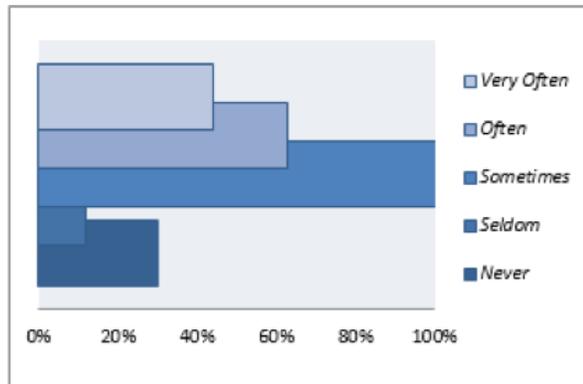


Figure-2 shows responses of participants on using social media applications and websites

On IPAQ-SF, it was reported that only 11 (4.4%) participants have performed vigorous physical activities 7 days a week for <30 minutes (23%), <1 hour (21.8%), <10 minutes (17.5%) while (26.2%) with no activity. In moderate physical activities like carrying light loads, bicycling at a regular pace, or table tennis only 14 (5.6%) participants have performed moderate activities 7 days a week for <30 minutes (29.4%), <10 minutes (22.2%), <1 hour (13.5%) while (22.6%) with no activity.

Furthermore, 75 (29.8%) participants walked for at least 10 minutes a time including at work and home, traveling from place to place or done slowly for exercise or recreational activities for <30 minutes (26.6%) and >1 hour (22.2%) respectively. Whereas 70 (27.8%) participants spent their time sitting at desk, visiting friends, reading, sitting or lying down to watch TV for <2 hours (27.8%), <4 hours (21.8%) while >8 hours (23%) respectively. However, the impact was analyzed using Chi-square Test of Association revealed no significant association between the prolonged use of internet and different physical activities level as depicted in Table-1.

Internet-Connectedness Duration	Vigorous PA	Moderate PA	Walking	Sitting
Pearson Chi-Square	7.92	7.62	4.40	5.15
Likelihood Ratio	10.46	9.03	5.37	5.79
*p>0.05				

DISCUSSION

The findings of this current study revealed that majority of users have own computer for prolonged time with broadband and 3G access. Moreover, majority of participants reported that they would extremely miss the use of computer and internet if they found it unavailable. Furthermore, only (4.4%) participants have performed vigorous, (5.6%) moderate activities 7 days a week. Whereas (27.8%) participants spent their time sitting at desk, visiting friends, reading, sitting or lying down to watch TV for <2 hours (27.8%), <4 hours (21.8%) while >8 hours (23%) respectively. This showed that with the increased use of internet, young adults performed low physical activity. However, its impact is still unclear as no significant association was determined.

A study conducted by Shek et al²⁷ on high school students of Hong Kong declared that internet-connectedness behavior was found to be consistently higher in males in comparison to females. Another study conducted by Chiu et al²⁸ who determined the internet addiction through smart phones among college students concluded that female students were found to be more addicted. On the other hand, our study didn't evaluate the gender-wise addiction behavior. Similarly, Malik et al²⁹ conducted a study to evaluate the addiction of Facebook but found no gender predominance. Furthermore, Kuss and Lopez-Fernandez³⁰ demonstrated that majority of students spent more time surfing the internet however found no difference in gender and declared the internet usage as problematic. However, Alavi et al³¹ showed that males are at three time of greater risk to develop internet addiction then females attributed to factors like cultural values, access to internet or may be personal habits.

It has been evident that the health problems of the human are constantly growing due to the development of associated technology. A number of researchers have suggested that most of the problems could have been avoided or mitigated, however different lifestyles, habits, and behaviour of people from a young age in relation to physical activity is required³². Students who perform any kind of physical activity tend to stay away from gadgets that involve the internet. As the students are inclined towards health-related activities instead of surfing the internet therefore they tend to sleep early due to physical fatigue thereby use the internet less. On the other hand, students who lack physical activities seemed lazy and to remain stuck with gadgetries. For that reason, Warbrick, Wilson and Boulton³³ found technology as a major reason for distraction among youth as due to this revolution the indoor activities have been replaced. Furthermore, Spengler et al³⁴ conducted a study on media usage and physical activity found that two-thirds of

young adults predominantly used media.

Consecutively, cardiovascular diseases are the leading cause of death that is increasing significantly around the globe with the predominant risk factors. In particular, obesity is a well-known risk factor that has increased dramatically in young adults in the last decade. Therefore most of the studies have emphasized the importance of incorporating physical activity thereby decreasing sedentary lifestyle that may include preoccupation with video games, computer, the internet, or watching TV. So, regular physical activity has importance for the prevention of obesity and other risk factors.

Strength

To the best of author's knowledge, this study is first to be conducted in Pakistan to determine the impact of internet-connectedness on physical activity in young adults. Furthermore, study was conducted on considerable sample size in recent pandemic on today's society, internet and mobile phones highlighting the issues of youth that needs to be addressed further. Thus, the excessive usage of internet, in adolescents particularly may leads to adverse outcomes.

Limitations

There are number of limitations in our study including the small sample size that is not substantial to generalize the results. Moreover, the data was self-reported by the participants that is subject to various biases and hasn't been verified independently. In addition, our study was limited to only a finite age group, with no discrimination analysis was run to evaluate multiple factors.

Future Directions

A number of multidisciplinary studies should be conducted further with larger sample size and diverse age groups for more definite results. Moreover, more definite internet-connectedness scales shall be used to comprehend association between the variables.

CONCLUSION

It was concluded that majority of young adults have used internet for prolonged time on computer/laptop/cell phones. Whereas limited reported to have regular physical activity while most of them spent their time sitting at desk, reading or lying down to watch TV. However, no significant association was found between the impacts of internet-connectedness with physical activity. Therefore, multicenter researches with larger sample size are required to be conducted to further evaluate the factors associated with addictive internet behavior and its related consequence so that the findings can be extrapolated to the general population with a reasonable confidence level.

REFERENCES

- [1] Gómez-Barroso JL, Marbán-Flores R. Telecommunications and economic development—The 20th century: The building of an evidence base. *Telecommunications Policy*. 2020 Mar 1;44(2):101904.
- [2] Farmer LS, Henri J. *Information literacy assessment in K-12 settings*. Scarecrow Press; 2008. Jimenez-Jimenez D, Martínez-Costa M, Rodríguez
- [3] CS. The mediating role of supply chain collaboration on the relationship between information technology and innovation. *Journal of Knowledge Management*. 2019 Apr 8.
- [4] Rivoltella PC. The third age of the media. *Research on Education and Media*. 2018 Jun 1;10(1):1-2.
- [5] Talwana JC, Hua HJ. Smart world of Internet of Things (IoT) and its security concerns. In 2016 IEEE International Conference on Internet of Things (iThings) and IEEE Green Computing and Communications (GreenCom) and IEEE Cyber, Physical and Social Computing (CPSCom) and IEEE Smart Data (SmartData) 2016 Dec 15 (pp. 240-245). IEEE
- [6] Liu X, Wu S, Guo Y, Chen C. The demand and development of Internet of Things for 5G: A survey. In 2018 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW) 2018 May 19 (pp. 1-2). IEEE.
- [7] Terras MM, Ramsay J. Mobile Use During Adolescence: Determinants and Impacts. In *Impacts of Mobile Use and Experience on Contemporary Society 2019* (pp. 1-19). IGI Global.
- [8] Palička P, Jakubec L, Zvoníček J. Mobile apps that support physical activities and the potential of these applications in physical education at school.
- [9] Hayat T, Dimitrova D, Wellman B. The differential impact of network connectedness and size on researchers' productivity and influence. *Information, Communication & Society*. 2020 Apr 15;23(5):701-18.
- [10] Udell S. *Pro web gadgets for mobile and desktop*. Apress; 2010 Apr 6.
- [11] Pelau C, Niculescu M, Stanescu M. Consumers' perception on the advantages and disadvantages of cookies and browsing history. In *Proceedings of the International Conference on Business Excellence 2020 Jul 1* (Vol. 14, No. 1, pp. 829-837). Sciendo.
- [12] Longstreet P, Brooks S. Life satisfaction: A key to managing internet & social media addiction. *Technology in Society*. 2017 Aug 1;50:73-7.
- [13] Rayan A, Dadoul AM, Jabareen H, Sulieman Z, Alzayyat A, Baker O. Internet use among university students in south West Bank: prevalence, advantages and disadvantages, and association with psychological health. *International Journal of Mental Health and Addiction*. 2017 Feb 1;15(1):118-29.

- [14] Hu X, Leung FK, Chen G. School, family, and student factors behind student attitudes towards science: The case of Hong Kong fourth-graders. *International Journal of Educational Research*. 2018 Jan 1;92:135-44.
- [15] Puspita RH, Rohedi D. The impact of internet use for students. *InOP Conference Series: Materials Science and Engineering* 2018 Feb 1 (Vol. 306, No. 1, p. 012106). IOP Publishing.
- [16] Sarah J, Lisman P, Gribbin TC, Murphy K, Deuster PA. Systematic review of the association between physical fitness and musculoskeletal injury risk: part 3—flexibility, power, speed, balance, and agility. *The Journal of Strength & Conditioning Research*. 2019 Jun 1;33(6):1723-35.
- [17] Silva BN, Khan M, Han K. Internet of things: A comprehensive review of enabling technologies, architecture, and challenges. *IETE Technical review*. 2018 Mar 4;35(2):205-20.
- [18] De Fausti F, Radini R, Valentino L, Tuoto T. QUALITY ASPECTS WHEN USING MOBILE PHONE DATA IN OFFICIAL STATISTICS. *Data Science & Social Research 2019 Book of Abstracts*.:44.
- [19] Shimoga SV, Eryana E, Rebello V. Associations of social media use with physical activity and sleep adequacy among adolescents: Cross-sectional survey. *Journal of medical Internet research*. 2019;21(6):e14290.
- [20] Bertenthal BI. MOTOR EXPERIENCE AND ACTION UNDERSTANDING. *Handbook of Integrative Developmental Science: Essays in Honor of Kurt W. Fischer*. 2020 Mar 20.
- [21] Shaykis S. A Feasibility Study of an Online Adaptation of a Video Coaching Parenting Intervention: Filming Interactions to Nurture Development (FIND) Web-based (Doctoral dissertation, University of Oregon).
- [22] Bala M, Chaudhary N. Nomophobia: An emerging fear. *Indian Journal of Health and Wellbeing*. 2020 Mar 1;11(1-3):115-8.
- [23] Ponglee N, Christiana RW, Battista RA, Rosenberg E. Smartphone use and physical activity among college students in health science-related majors in the United States and Thailand. *International journal of environmental research and public health*. 2019 Jan;16(8):1315.
- [24] Pew Research center, 2010. "Teens and Mobile Phones." Text messaging explodes as teens embrace it as the center piece of their communication strategies with friends.
- [25] Castells, M., Fernandez-Ardevol, M., Qiu, J., and Sey, A. 2007. "Mobil Communication and society: A global perspective." Cambridge, MA: MIT press.
- [26] Baker M, Stabile M, Deri C. What do self-reported, objective, measures of health measure?. *Journal of human Resources*. 2004 Oct 2;39(4):1067-93.
- [27] Shek DT, Zhu X, Dou D. Influence of family processes on internet addiction among late adolescents in Hong Kong. *Frontiers in psychiatry*. 2019 Mar 12;10:113.
- [28] Chiu YC, Pan YC, Lin YH. Chinese adaptation of the Ten-Item Internet Gaming Disorder Test and prevalence estimate of Internet gaming disorder among adolescents in Taiwan. *Journal of Behavioral Addictions*. 2018 Sep;7(3):719-26.
- [29] Malik A, Hiekkänen K, Dhir A, Nieminen M. Impact of privacy, trust and user activity on intentions to share Facebook photos. *Journal of Information, Communication and Ethics in Society*. 2016 Nov 14.
- [30] Kuss DJ, Lopez-Fernandez O. Internet addiction and problematic Internet use: A systematic review of clinical research. *World journal of psychiatry*. 2016 Mar 22;6(1):143.
- [31] Alavi AH, Jiao P, Buttler WG, Lajnef N. Internet of Things-enabled smart cities: State-of-the-art and future trends. *Measurement*. 2018 Dec 1;129:589-606.
- [32] López-Sobaler AM, Rodríguez-Rodríguez E, Aranceta-Bartrina J, Gil Á, González-Gross M, Serra-Majem L, Varela-Moreiras G, Ortega RM. General and abdominal obesity is related to physical activity, smoking and sleeping behaviours and mediated by the educational level: findings from the ANIBES study in Spain. *PloS one*. 2016 Dec 29;11(12):e0169027.
- [33] Warbrick I, Wilson D, Boulton A. Provider, father, and bro—Sedentary Māori men and their thoughts on physical activity. *International journal for equity in health*. 2016 Dec;15(1):1-1.
- [34] Spengler JO, Smith AD, Maddock JE, Stasi SM. Youth Sports and Physical Activity: Innovative Perspectives on the Role of Health Care Professionals. *Journal of Public Health Management and Practice*. 2018 Mar 1;24(2):96-8.

ORIGINAL ARTICLE**OCCUPATION-BASED INTERVENTION IN STROKE REHABILITATION: PERSPECTIVES OF OCCUPATIONAL THERAPY PRACTITIONERS****ABSTRACT****BACKGROUND AND AIMS**

The occupation-based intervention has shown effective recovery in overall disability of stroke survivors, yet the concept is unexplored among Pakistani occupational therapists. Therefore, this study is aimed to explore their perception regarding occupation-based intervention in stroke rehabilitation.

METHODOLOGY

A self-administered questionnaire designed in Google Docs was distributed online via email and social media applications to record participants' responses regarding occupation-based approaches in post-stroke rehabilitation.

RESULTS

A total number of 150 occupational therapists were enrolled in the study comprised 135 females and 15 males from 18 to 44 years of age. It was revealed that 53.3% therapists had taken an average of 45 minutes of clinical practice sessions on occupation-based intervention, 64.7 % believed to be well trained in the occupation-based approach. Moreover, 69.3% stated that their professional practice in post-stroke rehabilitation is generally based on the biomedical model, yet 39.3% of therapists have no clarity of this concept.

CONCLUSION

It was concluded that most occupational therapists understand the concept of occupation-based intervention. However, only a few were trained and implementing the approach in stroke rehabilitation, while the rest were found to have insufficient knowledge regarding this practice.

KEYWORDS

Occupational Therapy, Stroke, Therapy, Rehabilitation, Activities of Daily Living, Disability.

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INTRODUCTION

The stroke has been considered as a prevailing Non-Communicable Disease (NCD) affecting 80% of the individuals worldwide, particularly in the lower-middle-income countries¹ with a burden that is estimated to be continuously rising¹⁻³. This burden is most likely to be associated with risk factors like Diabetes, Hypertension, and Cardiovascular Diseases that are increasing at a tremendous rate, specifically among Asian population⁴. Strokes differ in seriousness and later functional effect depending upon the degree of the neurological harm and expected improvement. After a stroke, numerous survivors experience some type of functional impairment that will require a time of restoration. For those with gentle impairment, recovery can be achieved through a brief time of inpatient rehabilitation or through home-based or outpatient programs³⁶. Long term symptoms may involve hemiparesis, balance deficiencies, mobility challenges, visual changes, sensory loss, psychological deficiencies, speech disruption, exhaustion, and sensory processing issues³⁵. Any or all of those deficits might need in progress help and in some cases require institutionalized care³⁸. However, stroke has a significant impact on the survivors' quality of life as it contributes to a high level of long-term adulthood disability, morbidity, mortality⁵. Moreover, it has also imposed an economic and social burden on families within communities⁵. Moreover, the survivors experienced a wide variety of cognitive-motor, visual-perceptual and psychological deficits⁶⁻⁷ that may dramatically cause a substantial change in their lifestyle and participation in daily living activities⁸. Despite of the fact, occupational therapy is well-recognized in stroke rehabilitation to provide occupation-based intervention in order to cope with the consequences of functional deficits after stroke⁹. According to the World Federation of Occupational Therapists (WFOT)¹⁰, the profession of occupational therapy is concerned with the promotion of health and well-being through occupation. It has classified the profession's primary goal as enabling people to participate in activities of daily living¹¹. Moreover, it has also demonstrated the minimum standards of education for occupational therapists regarding its role and relationship with health-related outcomes¹²⁻¹³.

Occupation-based intervention is an activity-based treatment in which occupational therapy practitioners use therapeutic approaches as per patient body function and health to promote well-being and prevent other dysfunction¹⁴. Moreover, these approaches are intended to facilitate neuroplasticity in stroke patients to improve impaired body function, social participation, relaxation and cognition¹⁵. Occupational therapy related treatment centers are helping individuals to take part in everyday life exercises that they find significant³⁴. In 1997, Law, Polatajko, Baptiste, and Townsend characterized occupation as each action individuals do to possess themselves—including exercises of everyday living

(ADLs), getting a charge out of life, and social investment—that has meaning what's more, worth to them. For the objective behind this review occupation-based interventions are described as tasks that help performance in following aspects of occupation ADLs, instrumental exercises of everyday living (IADLs), rest and rest, training, work, play, relaxation, and social cooperation³⁴

Occupational therapy practitioners across all settings can aid stroke individual to improve their work performance through several methods. At times, practitioners use a skills remediation, or bottom-up, approach during which particular sensory and motor loss are forward with a goal of general function return across occupations. At other times, practitioners may use an occupation-based, or top down, approach that emphasizes observing all components of a personal, determining how they relate, and developing a holistic view of the patient that's considered altogether aspects of treatment³⁷. The purpose of this evidence-based review was to provide occupational therapy practitioners with the current evidence supporting the use of occupation-based interventions to improve areas of occupation and social participation after stroke. Skill remediation-based interventions, although relevant part of occupational therapy treatment of stroke patients, were not considered in this evidence-based review.

Consequently, at the beginning of 20th century, occupational therapy is realized to have core competency as profession-based practices and interventions in physical and mental disability¹⁶. Besides, the profession of occupational therapy has a paradigm shift to that of the year 1940 due to its objective orientation and practical intervention in healthcare¹⁶. However, this has also led to the mechanistic paradigm period due to its increased focus on biomedical explanations for practice¹⁶. Moreover, the use of occupation to address the impact on health-related quality of life is the core of occupational therapy, and practice pattern regarding the use of occupation-based approaches was then established and distributed worldwide¹⁷. In addition to it, the use of occupation-based intervention in stroke rehabilitation is well documented. However, there is no such evidence to uncover an occupational therapist's perspective using daily occupation-based intervention into their practice with stroke patients. Therefore, this study is aimed to explore the perspective of Pakistani occupational therapists regarding occupation-based intervention in stroke rehabilitation to find out the depth of understanding related to implementation and challenges in post-stroke rehabilitation.

METHODOLOGY

Study Setting

Data was collected from rehabilitation institutes of Karachi included Dr. Ziauddin Hospital, North and Clifton campuses, Liaquat National School of Physio-

therapy and Institute of Physical Medicine & Rehabilitation.

Target Population

Occupational Therapists.

Study Design & Duration

A cross-sectional survey was conducted from September to December 2020.

Sample Size

n=150

Sample Selection

Inclusion & Exclusion Criteria

Occupational Therapists aged 25 to 45 years working in stroke rehabilitation unit having an experience of at least 1 year were included. Therapists with insufficient knowledge of stroke rehabilitation or refusal to participate were excluded.

Data Collection Procedure

A self-administered questionnaire was designed on Google Docs, distributed online via e-mails and social media platforms (Facebook, WhatsApp and Instagram). The questionnaire was comprised of 15 questions on demographics and occupation-based intervention on 5-point Likert scale of Strongly Agree, Agreed, Neutral, Disagree, and Strongly Disagree.

Prior to data collection, all participants will be given informed consent forms to ensure their voluntary participation in the study. Afterwards, responses on the questionnaire were recorded that were further analyzed for results.

Data Analysis Strategy

Data was entered and analyzed on IBM Statistics Software version 20. The demographic characteristics and responses of the participants were represented through mean, standard deviation, frequency and percentage whereas bar graphs were used for the representation of responses.

Ethical Considerations

All information of the participants was kept anonymous under the investigator’s supervision. Moreover, participants were allowed to leave any question they did not want to answer while considerable to respond biased free.

RESULTS

A total number of 150 occupational therapists enrolled in the study with mean age of 25.5±4.3 with maximum number of respondents attained from BS Occupational Therapy practitioners (69.3%) practicing in Pediatrics (51%) or Neurology (32%) with an experience of 3-5 years in their respective fields. The details are depicted in Table-1.

Variables	n (%)
Gender	15 (10%)
Male	135 (90%)
Female	
Age (Years)	4 (2.7%)
18-24	45 (30%)
25-34	12 (8%)
25-44	1 (0.7%)
44-60	
Education Level	27 (18%)
BSc Occupational Therapy	104 (69.3%)
BS Occupational Therapy	18 (12%)
Accelerated Doctor of Occupational Therapy	1 (0.7%)
Doctor of Occupational Therapy	
Working Experience (Years)	57 (38%)
1-2	72 (48%)
3-5	18 (12%)
>5	
Rehabilitation Areas	77 (51%)
Pediatric	48 (32%)
Neurology	9 (6%)
Psychiatric	15 (10%)
School-Based	

It was observed that majority of the therapists (72%) thought to use occupation-based intervention in practice of occupational therapy in post-stroke rehabilitation while (70%) reported that sufficient theories and training time are provided in their degree program while (88%) agreed that occupation-based intervention is the core philosophy of their profession with an estimated time duration of 45 minutes sessions in any setting in post-stroke rehabilitation in which (45%) agreed to practice 50% of it as illustrated in Figure-1 and 2.

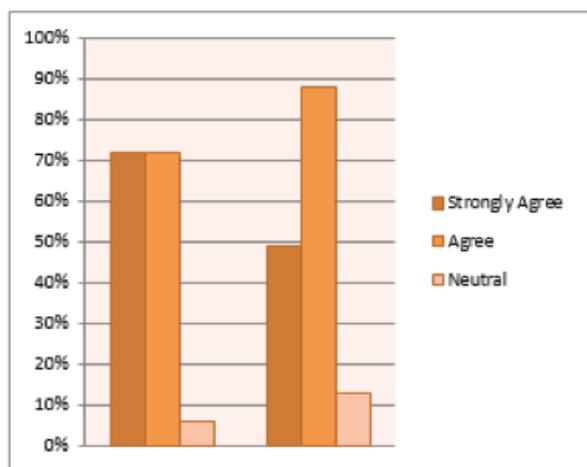


Figure-1 shows responses of participants regarding usage of occupation-based intervention and its core philosophy

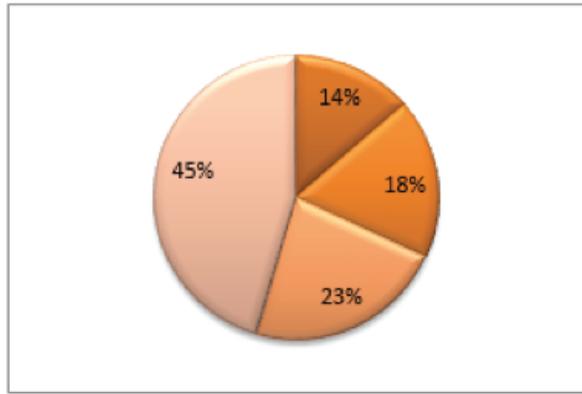


Figure-2 represents percentage of estimated occupation-based intervention session

There are certain challenges that are faced by occupational therapists in implementing the occupation-based approach. Figure-3 represented that (36.7%) therapists agreed that the practice is not relevant in Pakistani cultural settings, (41.3%) agreed that occupational therapy sessions have limited time therefore therapists are reluctant to practice it moreover, (84%) therapists have clear understanding about it however (36%) respond on neutral as shown in Figure-3.

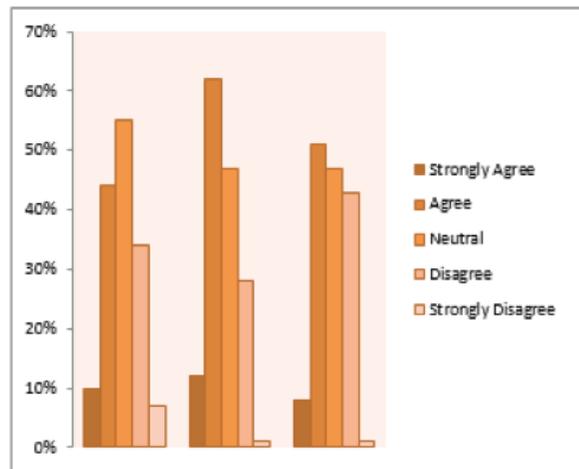


Figure-3 shows responses of participants regarding understanding usage of occupation-based intervention in cultural setting

Majority of therapists (84%) agreed for CME's on occupation-based practices as limited information is known, (64%) thinks that occupation-based intervention should be taught as a separate module at institutions/clinical settings. Moreover, (70%) agreed to enhance the usage of occupation-based approaches in post-stroke patients to improve patient's quality of life.

DISCUSSION

The findings of this study revealed the varying percep-

tions and insights of Pakistani occupational therapists in implementing the occupation-based intervention in post-stroke rehabilitation. It was revealed that 53.3% occupational therapist has an average 45 minutes of clinical practice sessions on occupation-based intervention. In comparison, 91.4% understand the philosophy of occupation-based intervention as the core of the profession, while 64.7 % believed to be well trained in occupation-based approaches. Moreover, 69.3% stated that their professional practice in post-stroke rehabilitation is generally based on the biomedical model, yet 39.3% of therapists have no clarity on the concept of occupation-based intervention and its practice with post-stroke survivors and facing difficulty to achieve this goal.

According to the World Federation of Occupational Therapy, occupational therapy evaluation and intervention should mandatorily use purposeful and meaningful activities for individual and social context rather than the impairments of body structure¹⁸. Our study results also showed that most Pakistani occupational therapists' teaching, practices, and research are based on occupation-based intervention and understanding the client needs, valuing, explanations, and finding out the difficulty patient's face in the community¹⁹. Unfortunately, some occupational therapists reported that they often face difficult situations to implement the occupation-based intervention in post-stroke patients in the medical setting because Pakistani culture and health system do not reflect the values of occupation-centered practice²⁰. In addition to it, certain client factors do not realize the occupational intervention concept that may affect their recovery process²¹ also create confusion and challenges to Pakistani occupational therapists²².

Occupation-based interventions focus on the client's occupation, whereas they are less attractive, have low interest, and have poor patient motivation²³. In Pakistan, contexts like illiteracy among patients, poverty, lack of cooperation with the therapist, the severity of illness, an increased number of patients demanding occupational therapy services shall be considered before imposing occupation-based intervention in practice. Another challenge is the limited number of occupational therapist service over 10000 head of population in Pakistan which is very low²⁴. Moreover, most occupational therapist practices based on medical settings have restrictions, shortage of time, and substantial no-patient case-loads in their daily schedules²⁵. In addition to challenges, Pakistani cultural values, where the family members feel obligated to help the clients in their daily occupations²⁶. Consecutively, the health system of Pakistan with bureaucratic culture policy in hospitals leads to difficulty in occupation-based intervention usage²⁷.

The findings of this study proposed a need to devise several strategies to overcome the challenges to

implementing the occupation-based intervention in Pakistan. Therefore, patients, caregivers, and multidisciplinary rehabilitation team members should be given a piece of adequate knowledge about its use in their post-stroke rehabilitation practice²⁸. Moreover, updating the occupational therapy educational curriculum at the national level and training related to occupation-based intervention practice in various disability conditions is crucial²⁹⁻³⁰. Furthermore, expert occupational therapists must be highlighted as reflective practitioners to diminish the challenges of OBI³¹⁻³³. Stroke or Cerebrovascular Accident is caused by the reduced blood supply to the brain due to infarction or a hemorrhage, categorized as a major or minor stroke. The symptoms after post-stroke vary depending upon the size of the injury and affected vessel. Therefore this may lead to cognitive, sensory, and physical impairments presented following stroke. In Pakistan, the ideal age of stroke patients is 57-62 years; in particular, males are more commonly affected than females constituting a 60% to 40% ratio. Occupational therapists investigate, gather information, and create a collaborative environment related to patients to set goals and select occupation-based interventions³⁴.

Occupation-based intervention is described as the task performed by stroke patients in interaction with the environment to improve overall cognitive, perceptual, motor control functions and maximize the patient's ability to perform personal self-care and domestic tasks at home and work³⁵. Occupation-based practice in rehabilitation is a practical approach for clients to improve the quality of life following health events or diseases. Moreover, it provides the occupational therapist with a unique, holistic, and more client-centered approach. Occupation-based practice in their cultural clinical settings may face specific logistic issues; therefore, the credibility of occupation and contextual factors are required for occupation-based practice in their clinical setting to provide in-hand rehabilitation³⁶. A study conducted in Iran inspected and examined the Iranian occupational therapists in implementing occupation-based practice in their clinical settings showed that occupational therapists have sound knowledge in their education program about occupation-based intervention and is effective to provide meaningful intervention based on the client's interests, needs, health and participation in daily life³⁷. Furthermore, specific weaknesses in their current occupational therapy bachelor curriculum related to occupation-based practice need to be revised according to faculty and student's requirements³⁸. Occupation-based intervention effectively achieves the desired therapy outcomes that are proved in various practice settings, including hand therapy, neurological and burn injury rehabilitation. Moreover, positive patient perceptions were recorded on occupation-based treatments that intrinsically motivated them and gave a sense of ownership. Furthermore, there is a need to allocate some funds and creative

work to develop and evaluate occupation-based interventions in natural contexts. It has been shown in the literature that there are numerous pieces of evidence available in developed countries in this context yet unexplored in Pakistani occupational therapists.

Despite of the fact, number of studies revealed work-related stress among occupational therapists in comparison to other healthcare professionals as they involved in multi-disciplinary rehabilitation therefore are exposed to repetitive exposure to physical effort, difficult behavior, home based services and prolonged interventions, particularly in stroke based-interventions. This might leads to the risk of encountering occupational pressure, reduces their quality of life and increase stress²⁹⁻³⁰. Moreover, it was addressed that the risk factor of physical stress and strain faced by occupational therapists contribute to stress are physical challenging role. Also in home based therapy sessions where the patient is completely depended on therapist so the physical work load increase in home therapy session which decreases the therapist quality of life³²⁻³⁴.

Strength

To the best of the author's knowledge, this type of study on occupation-based practice in post-stroke disability is the first to be conducted in Pakistan, clearly representing the core philosophy's occupational therapy profession and its authentic practice. The study also highlights the challenges occupational therapists face in their practice and needs to upgrade the intervention context concepts to promote effective health-related outcomes.

Limitations

This study has some limitations that included selected occupational therapists practicing in stroke rehabilitation according to inclusion criteria. The sample size was not achieved to the fullest due to the ongoing COVID pandemic, while limited male responses were received compared to females. Furthermore, specific questions did not attempt that may exhibit some biases in the results.

Future Directions

According to epidemiological study in Pakistan, it was identified that risk factors related to stroke are prevalent in which hypertension is most commonly evident (68.88%) whereas urban population is more prone to all risk factor except heart disease. Moreover, an overall incidence of stroke is much higher in Pakistan than any other developed country. Therefore there is a need for occupational therapy professionals, leaders, and researchers to plan large-scale studies related to occupation-based intervention practices in various disability conditions for possible prevention in Pakistan following the core ideology of the occupational therapy profession in multidisciplinary rehabilitation.

CONCLUSION

It was concluded that most occupational therapists understand the concept of occupation-based intervention, but only a few are trained and implementing the approach in stroke rehabilitation, while the remaining were found to have insufficient knowledge regarding it. Therefore, future studies should highlight the scope of occupation-based intervention in Pakistan to promote occupational therapy and better care of the disorder.

REFERENCES

- [1] Khan MI, Khan JI, Ahmed SI, Ali S. The epidemiology of stroke in a developing country (Pakistan). *Pakistan Journal of Neurological Sciences (PJNS)*. 2019;13(3):30-44.
- [2] Khalid W, Rozi S, Ali TS, Azam I, Mullen MT, Ilyas S, Soomro N, Kamal AK. Quality of life after stroke in Pakistan. *BMC neurology*. 2016 Dec;16(1):1-2.
- [3] Schwertfeger, J.L., Thuente, L., Hung, P. and Larson, S.L., 2020. Post-discharge interventions to enhance coping skills for survivors of stroke and their caregivers: a scoping review protocol. *JBI Evidence Synthesis*, 18(2), pp.332-340.
- [4] Blanton S, Clark PC, Cotsonis G, Dunbar SB. Factors associated with depressive symptoms of carepartners of stroke survivors after discharge from rehabilitation therapy. *Topics in stroke rehabilitation*. 2020 Nov 16; 27(8):590-600.
- [5] Fallahpour M. Participation in everyday occupations among persons with stroke in Iran: An exploration of perceived participation, associated factors and lived experience. *Inst för neurobiologi, vårdvetenskap och samhälle/Dept of Neurobiology, Care Sciences and Society*; 2011 Sep 23.
- [6] Krug G, McCormack G. Occupational therapy: evidence-based interventions for stroke. *Missouri medicine*. 2009 Mar 1;106(2):145-9.
- [7] Sinclair K. International perspectives on occupation and participation. *World Federation of Occupational Therapists Bulletin*. 2004 Nov 1;50(1):5-8.
- [8] Di Tommaso A, Isbel S, Scarvell J, Wicks A. Occupational therapists' perceptions of occupation in practice: An exploratory study. *Australian occupational therapy journal*. 2016 Jun; 63(3):206-13.
- [9] Carter MC. Parenting as Occupation: Occupational Therapists' Perspectives on Working with Parents in Mental Health. 2020
- [10] Skubik-Peplaski C, Carrico C, Nichols L, Chelette K, Sawaki L. Behavioral, neurophysiological, and descriptive changes after occupation-based intervention. *American journal of occupational therapy*. 2012 Nov 1;66(6):e107-13.
- [11] Lloyd K, Gee BM. Use of occupation-based practice by therapists: A national practice pattern analyzed. *American Journal of Occupational Therapy*. 2016 Aug 1;70(4_Supplement_1):7011505119p1-.
- [12] Daud AZ, Judd J, Yau M, Barnett F. Issue in applying occupation-based intervention in clinical practice: a Delphi study. *Procedia-Social and behavioral sciences*. 2016 Jun 23;222:272-82.
- [13] Kielhofner G, Hammel J, Finlayson M, Helfrich C, Taylor RR. Documenting outcomes of occupational therapy: The Center for Outcomes Research and Education. *American Journal of Occupational Therapy*. 2004 Jan 1;58(1):15-23.
- [14] Mahani MK, Mehraban AH, Kamali M, Parvizy S. Facilitators of implementing occupation based practice among Iranian occupational therapists: A qualitative study. *Medical journal of the Islamic Republic of Iran*. 2015;29:307.
- [15] Olsson L, Lundborg M. Occupational Therapy Process for Patients after Stroke in Thailand: a qualitative study.
- [16] Asif M, Khalife S A, Chughtai M R, Kumar M A, Khan V. The Barriers in Evidence Based Physical therapy with Stroke Patients. *International Journal of Scientific & Engineering Research*. 2017 march 3;8(3)966-970.
- [17] Asif, M., 2017. The Barriers In Evidence Based Physical Therapy With Stroke Patients. [online] *Ijser.org*. Available at: <<https://www.ijser.org/researchpaper/The-Barriers-in-Evidence-Based-Physical-therapy-with-Stroke-Patients.pdf>> [Accessed 3 March 2017].
- [18] Rowland TJ, Cooke DM, Gustafsson LA. Role of occupational therapy after stroke. *Annals of Indian Academy of Neurology*. 2008 Jan 1;11(5):99.
- [19] Tomori K, Nagayama H, Ohno K, Nagatani R, Saito Y, Takahashi K, Sawada T, Higashi T. Comparison of occupation-based and impairment-based occupational therapy for subacute stroke: a randomized controlled feasibility study. *Clinical rehabilitation*. 2015 Aug;29(8):752-62.
- [20] Wolf TJ, Chuh A, Floyd T, McInnis K, Williams E. Effectiveness of occupation-based interventions to improve areas of occupation and social participation after stroke: An evidence-based review. *American Journal of Occupational Therapy*. 2015 Jan 1;69(1):6901180060p1-1.
- [21] Mulligan S, White BP, Arthanat S. An examination of occupation-based, client-centered, evidence-based occupational therapy practices in New Hampshire. *OTJR: occupation, participation, and health*. 2014 Mar;34(2):106-16.
- [22] van Vuuren JJ, Okyere C, Aldersey H. The role of Occupational Therapy in Africa: A scoping review. *South African Journal of Occupational Therapy*. 2020 Dec;50(3):3-21.
- [23] Parker DM. An exploration of client-centered practice in occupational therapy: perspectives and impact (Doctoral dissertation, University of Birmingham). 2013
- [24] Chisholm D, Dolhi CD, Schreiber J. Occupational therapy intervention resource manual: A guide for occupation-based practice. Cengage Learning; 2004.
- [25] Colaianni D, Provident I. The benefits of and

- challenges to the use of occupation in hand therapy. *Occupational Therapy in Health Care*. 2010 Mar 1;24(2):130-46.
- [26] Wressle E, Samuelsson K. Barriers and bridges to client-centered occupational therapy in Sweden. *Scandinavian Journal of Occupational Therapy*. 2004 Mar 1;11(1):12-6.
- [27] Pierce D. How can the occupation base of occupational therapy be strengthened?. *Australian Occupational Therapy Journal*. 2003;50(1):1-2.
- [28] Nilchaikovit T, Hill JM, Holland JC. The effects of culture on illness behavior and medical care: Asian and American differences. *General hospital psychiatry*. 1993 Jan 1;15(1):41-50.
- [29] Coster WJ. 2008 Eleanor Clarke Slagle Lecture. Embracing ambiguity: facing the challenge of measurement. *The American journal of occupational therapy: official publication of the American Occupational Therapy Association*. 2008 Nov 1;62(6):743-52.
- [30] Stack R, Barker D. Students as advocates for occupation-based practice. *Occupational Therapy Now*. 2011;13(3):13-5.
- [31] Whiteford GE, Wilcock AA. Centralizing occupation in occupational therapy curricula: Imperative of the new millennium. *Occupational Therapy International*. 2001;8(2):81
- [32] Ripat J, Wener P, Dobinson K, Yamamoto C. Internalizing client-centredness in occupational therapy students. *Journal of Research in Interprofessional Practice and Education*. 2014 Sep 24; 4(2).
- [33] Fisher AG. Occupation-centred, occupation-based, occupation-focused: Same, same or different?. *Scandinavian journal of occupational therapy*. 2013 May 1;20(3):162-73.
- [34] American Occupational Therapy Association. (2014). *Occupational therapy practice framework: Domain and process*(3rd ed.). American Journal of Occupational Therapy,68(Suppl. 1), S1-S48.
- [35] Jørgensen, H. S., Nakayama, H., Raaschou, H. O., Vive-Larsen, J., Støier, M., & Olsen, T. S. (1995). Outcome and time course of recovery in stroke. Part I: Outcome. The Copenhagen Stroke Study. *Archives of Physical Medicine and Rehabilitation*, 76, 399-405.
- [36] Teasell, R. W., Foley, N. C., Bhogal, S. K., Chakraverty, R., & Bluvol, A. (2005). A rehabilitation program for patients recovering from severe stroke. *Canadian Journal of Neurological Sciences*, 32, 512-517.
- [37] Christiansen IC, Baum CM, Bass-Haugen J. Person-environment-occupation-performance: An occupation-based framework for practice. *Occupational therapy: Performance, participation, and well-being*. 2005:243-59.
- [38] Kelly-Hayes, M., Beiser, A., Kase, C.S., Scaramucci, A., D'Agostino, R. B., & Wolf, P. A. (2003). The influence of gender and age on disability following ischemic stroke: The Framingham Study. *Journal of Stroke and Cerebrovascular Diseases*, 12, 119126. [http://dx.doi.org/10.1016/S1052-3057\(03\)00042-9](http://dx.doi.org/10.1016/S1052-3057(03)00042-9).



ORIGINAL ARTICLE

PERCEPTION OF PHYSIOTHERAPIST ON EFFECTS OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION IN COMPARISON TO THERAPEUTIC ULTRASOUND FOR THE TREATMENT OF GRADE V BELL'S PALSY

ABSTRACT

BACKGROUND AND AIMS

Transcutaneous Electrical Nerve Stimulation (TENS) and Ultrasound (US) both are the most common therapeutic intervention modalities applied for Bell's palsy treatment. The study was conducted in a tertiary care hospital in order to evaluate the perception of physiotherapist regarding the effects of TENS and US in comparison for the treatment of grade V Bell's palsy.

METHODOLOGY

It is an observational study based on cross sectional survey based on questionnaire from the physical therapists of a tertiary care hospital with the clinical experience of one year or more. The sample size was 45 based on convenient sampling technique with the mean age of 27.4 ± 7.75 years.

RESULTS

The results of the study indicated that preference of therapist for the effective treatment of grade 5 Bell's palsy is TENS in comparison to US for early prognosis and patient's satisfaction. Further, the therapist prefers burst mode of TENS for effective results.

CONCLUSION

Though the study favors use of TENS However, due to small sample size, further studies are required to be conducted in domain to strengthen the role of Burst Mode of TENS as an effective intervention for Bell's palsy.

KEYWORDS

Bell's Palsy, Tens, Ultrasound, House brackmann Scale, Physiotherapist, Treatment.

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INTRODUCTION

Among the other causes responsible for paralysis of face, Bell's palsy accounts for about 75%¹. Bell's palsy has been experienced by 11 to 40 persons from 100,000 worldwide every year². The mean age ranges between 15 to 40 years with both genders being equally influenced, however 45% cases per 10,000 reported are pregnant females³.

Bell's palsy is a unilateral paralysis of the facial nerve causing muscular weakness at one side of the face, resulting from traumatic, infectious, inflammatory, compressive or metabolic abnormalities, in most of the cases with the unknown cause⁴. It causes loss of sensation, muscular weakness, difficulty in functions like eating, talking etc.⁵ The major symptoms for Bell's palsy includes drooping of jaw, loss of nasolabial fold, loss of facial expression, deviation of mouth to opposite side, failure of eye-lid to close, or loss of wrinkles of forehead on looking up⁶. However, Viral infections caused by Herpes zoster,⁷ Mumps, E.B. virus results in inflamed VII cranial nerve during its course through the bony labyrinth part of the facial canal, where compression and demyelination of the axons and blood supply to the nerve occurs⁸.

House and brackmann in 2017 developed a grading scale to evaluate facial paralysis in relation to extent of nerve damage. This scale measures six grades. In this scale grade I allocates normal activity of face muscles, grade II represents slight weakness, dysfunction and slight dissymmetry of facial muscles, grade III meant to be moderate dysfunction is apparent but not obvious difference of symmetry between both sides, grade IV represents moderately intense dysfunction apparent and causes asymmetry on each sides, grade V means to be intense dysfunction hardly detectable movement and in grade VI there is complete loss of function of facial muscles⁹.

Multiple approaches are used in order to treat the Bell's palsy including both conservative and surgical approaches. In addition, Physical therapy approaches including electrotherapy, massage and exercises of face to stimulate the denervated muscles shows promising results when applied for rehabilitation of a patients with Bell's palsy. Further, electrical stimulation like TENS, Ultrasound, electro-acupuncture¹⁰, pulsed signal therapy (PST)¹¹ and Russian current have shown to be effective in axonal outgrowth and myelination, and partial activation of facial muscles in Bell's palsy¹². Significant effects were observed in the functional limitations of bell's palsy by the use of low level laser therapy¹³. In addition, kabat rehabilitation along with nerve stimulation has shown promising results in the improvement of physical and social functions¹⁴. Mustafa in 2017 found out the combination of kabat exercise, kinesiotherapy and electrotherapy reduces facial muscle asymmetry¹⁵. Similarly, K-taping and acupuncture with support of physiotherapy is safe and supportive therapy to manage early stage of

ringer's paralays¹⁶. Another research concludes that the use of PNF technique is more effective than kinesio taping¹⁷. Similar results were reported by Pooja kumari et al in her study¹⁸.

Electrical stimulation is applied to re-establish or get outward appearance (for example, rumination, blowing, flickering eyes, grinning, sucking, and others) and accessory muscles including those of neck and eyes are also stimulated to achieve better result¹⁹. Among other electrical stimulations, Transcutaneous electrical nerve stimulation (TENS) is most commonly used to enhance the quality of facial muscle's proprioception and neuromuscular coordination in the chronic stage of bell's palsy¹³. It is known for providing pulsed currents for depolarizing peripheral nerve fibers from skin. TENS have five modes of delivery that are conventional, acupuncture like, brief intense, burst, and modulation²⁰. Most common sites used for innervation of facial nerve via TENS includes the orbicularis oculi for blinking of eye, the frontalis muscle used for raising eyebrow, the zygomaticus major muscle for grinning, and the orbicularis oris muscle for lip pucker⁴. Further, therapeutic Ultrasound in its conventional mode, is known to treat soft tissue pathologies, wounds, and bone fractures²⁰.

In patients with bell's palsy ; generally features settle down completely except for some patients who experience hardship for prolonged periods of time as symptoms do not settle by 3 weeks¹⁴. Usually prognosis is appreciative when symptoms seem to be recovered within 21 days of onset of disease²¹. However, in cases of absolute facial paralysis, worst pain, people older than 60 years of age, herpes zoster virus, in contagious disease conditions like pregnant women, hypertensive patient and diabetic patient or in case of severe degeneration of facial nerve poor prognosis has been recorded¹⁴. The main aim of this study is to evaluate the effective of TENS in comparison to Therapeutic ultrasound in the perspective of physical therapist for the treatment of Bell's palsy.

METHODOLOGY

Study Setting

Data was collected from tertiary care hospital in Karachi.

Target Population:

Physical therapist with the experience of = or ≥ 1 years.

Study Design

Cross sectional study

Duration of Study

This research took 6 - 8 months after the approval of synopsis.

Sample Size

N=45

Sampling Technique

Simple convenience sampling.

Sample selection

Physical therapist with clinical experience of one or more than one year and have treated patients with Grade V house brackmann score Bell's palsy without any secondary complications. However, professional with experience of less than one year or lack experience of less than two week in the treatment of bell's palsy.

Data Collection Tool

Data was collected by a Questionnaire designed by researchers which included 10 questions.

Question were based on the therapist opinion regarding grades of House Brackmann's scale, effects of TENS and ultrasound and its modes on prognosis of Bell's palsy and safest modality for Bell's palsy.

Data Collection Procedure

Research questionnaire was provided to the physical therapist at a tertiary care hospital who gave their consent to participate in the study.

Data Analysis

Data analysis was done with the help of METCALC SPSC.

Ethical Considerations:

Written consent was taken from the participants of the study and autonomy to participate in the study was given to the participants. Participants were given the right to with draw from the study anytime. Confidentiality of the participants was not breached nor was any harm caused to them during the course of research.

RESULTS

The total numbers of 45 participants, 14 male and 31 females, were recruited for the identification of their perception in the effectiveness of TENS for the early treatment of Bell's palsy. The mean age of the participants was 27.4 ± 7.75 years with the clinical experience of 3.51 ± 4.97 years.

95.55% of our subjects considered TENS as best modality while remaining 4.45% were in favor of ultrasound as safest modality for the Bell's palsy treatment. In this cross sectional study when subjects were asked about the best mode of TENS for Bell's palsy treatment according to their clinical experience, 88.88% responded in favor of Burst mode while other 11.12% were comfortable to use conventional mode on their Patient's with grade V Bell's palsy. Meanwhile 71.11% subjects consider that Electrotherapy may cause complications on patients with Bell's palsy.

Question	Response 1	Response 2
Knowledge of participants about house brackmanns scale	86.66% were affirmative	13.34% were negative
Effective treatment for Bell's palsy	95.55% responded with tens	4.45% responded with ultrasound
Safest modality for Bell's palsy treatment	95.55% responded with tens	4.45% responded with ultrasound
Modality aiding for early recovery	95.55% responded with tens	4.45% responded with ultrasound
Effective mode of TENS for the treatment of Bell's palsy	88.88% responded with burst mode of TENS	11.12% responded with conventional mode of TENS
Effective mode of ultrasound for the treatment of Bell's palsy	84.44% participants responded with pulsed mode of ultrasound	15.56 % participants responded with continuous mode of ultrasound
Duration the treatment of Bell's palsy	39 participants responded that it takes 6-7 sessions	6 responded that it take 4 - 5 sessions
Patient's satisfaction for the treatment modality	41 responded for TENS	4 participants responded for Ultrasound
Complications of using electrotherapy for treating Bell's palsy grade V.	71.11% were affirmative	28.89% were negative

Table 1: Responses of participants to the close ended questions provided

Moreover, 39.7% subjects that a patient with grade V Bell's palsy can recover completely on the other hand 31.7% subjects responded negatively. The results of the study indicates the preference of therapist for the effective treatment of grade 5 Bell's palsy is tense in comparison to ultrasound in reference to early prognosis and patient's satisfaction.

DISCUSSION

The findings of our study highlight the perspective of physical therapist that favors TENS for the treatment of Bell's palsy. Similar findings were observed in a study conducted by Alice (2020) where she reported the beneficial results of electrical stimulation in patients of acute case of Bell's palsy⁵. Further, study also stated majority of the therapists favored the use of electrical therapy in clinical practice to treat Bell's palsy⁵.

Multiple studies have stated the effects of neuromuscular electrical stimulation are significant in term to enhance of strength of facial muscles post paralysis or paresis^{22,23}. Further, evidence has proved that paralyzed muscle can be evoked by electrical stimulation along with massage for facial muscles relaxation and facial exercises for muscular strengthening⁴. It has also been observed that NMES (neuromuscular electrical stimulation) when combined with SWD (shortwave diathermy) and exercises for the treatment of Bell's palsy reduces complexity and recover functional activities²⁴.

Moreover, according to the subjects of our study, TENS is most effective, safe, and less complicated electrotherapy to treat bell's palsy grade V whereas Ultrasound has very low or negligible usage in treating bell's palsy. Efficacy of TENS on bell's palsy patients is also proved by J.Lylykangas et al²⁵ in their article, stating the effectiveness of TENS on eye blinking and surrounding muscles. Makel el al also researched on reanimation of facial muscles by TENS. Simon goldie with his co member's conduct this case study in which they observe after applying electrical stimulation on bell's palsy patients result was quite favorable with this treatment²⁶. Electrical stimulation has shown non observable effects initially and showed positive results after a month²⁷. Contradictory, Anoop Kurian (2019) in his case study on acute case of Bell's palsy reported TENS treatment to have considerably low healing rate²⁸. On the adequacy of electrical incitement as a source of facial nerve stimulator in loss of motion, no significant results were observed²⁹.

However, Study finding also revealed the significant side effects and complication of electrotherapy were observed by therapist during the treatment course. Such results were also reported by Allison in a study where therapist was asked about the effects of TENS on facial paralysis⁵. In opposition, Wiebke (2020) suggested that Surface electrical stimulation for facial paralysis is not harmful nor does it delays or prevents reinnervation or increase synkinesis in facial paralysis³⁰. Since a perception based study is not enough to support the role of electrical stimulation on grade V Bell's palsy, further evidence is required to support it.

CONCLUSION

To conclude, this perception based study favors the use of TENS as the efficient modality to use for the

innervation of facial nerve in Grade V Bell's palsy patients. However, being conducted on a very small sample, further studies are required to be conducted in domain to strengthen the role of electrical stimulation as an effective intervention for Bell's palsy.

REFERENCES

- [1] Usman, M., Nawaz, S. and Rehman, S., Spectrum of bell's palsy : an experience at DHQ teaching hospital DI KHAN, PAKISTAN. PAKISTAN JOURNAL OF HEALTH SCIENCES, 2018. 2(2), 73-76.
- [2] Kim SY, Lee CH, Lim JS, Kong IG, Sim S, Choi HG. Increased risk of Bell palsy in patient with migraine: A longitudinal follow-up study. *Medicine*. 2019 May; 98(21).
- [3] Ferreira M, Firmino-Machado J, Marques EA, Santos PC, Simões AD, Duarte JA. Prognostic factors for recovery in Portuguese patients with Bell's palsy. *Neurological research*. 2016 Oct 2;38(10):851-6.
- [4] Ilves M, Lylykangas J, Rantanen V, Mäkelä E, Vehkajä A, Verho J, Leikkala J, Rautiainen M, Surakka V. Facial muscle activations by functional electrical stimulation. *Biomedical Signal Processing and Control*. 2019 Feb 1; 48:248-54.
- [5] Munn A, Cameron M, Loyo M. Trends in Electric Stimulation for Facial Paralysis: Electronic Survey of Physical Therapists in Oregon. *Archives of Physiotherapy and Rehabilitation*. 2020; 3:001-8.
- [6] Oshaghi S, Ghadimi K, Rezaeian A, Dokhanchi Z. Retracted Article: Effect of Short Term Use of Repetitive Transcranial Stimulation as an Adjuvant Therapy for Bell's palsy. *Archives of Neuroscience*. 2019 Jan 31; 6(1).
- [7] Eviston TJ, Croxson GR, Kennedy PG, Hadlock T, Krishnan AV. Bell's palsy: aetiology, clinical features and multidisciplinary care. *Journal of Neurology, Neurosurgery & Psychiatry*. 2015 Dec 1; 86(12):1356-61.
- [8] Bhargava P, Toshniwal OD, Sharma R, Das M, Mohapatra S, Verma A. Bell's Palsy: A Systematic Review of Two Cases. *Indian Journal of Contemporary Dentistry*. 2016; 4(1):84-7.
- [9] Scheller C, Wienke A, Tatagiba M, Gharabaghi A, Ramina KF, Scheller K, Prell J, Zenk J, Ganslandt O, Bischoff B, Matthies C. Interobserver variability of the House-Brackmann facial nerve grading system for the analysis of a randomized multi-center phase III trial. *Acta neurochirurgica*. 2017 Apr 1; 159(4):733-8.
- [10] Liu ZD, He JB, Guo SS, Yang ZX, Shen J, Li XY, Liang W, and Shen WD. Effects of electroacupuncture therapy for Bell 's palsy from acute stage: study protocol for a randomized controlled trial. *Trials*. 2015 Dec; 16(1):1-7.
- [11] Gorelick L, Rozano-Gorelick A. Full Recovery of the Patient With Bell's Palsy Within Two to Six Weeks After Single Course of Pulsed Electromagnetic Therapy-Case Reports.
- [12] Deng Y, Xu Y, Liu H, Peng H, Tao Q, Liu H, Liu H, Wu J, Chen X, Fan J. Electrical stimulation promotes

- regeneration and re-myelination of axons of injured facial nerve in rats. *Neurological research*. 2018 Mar 4; 40(3):231-8.
- [13] Banu HB, Rahman S, Hossain S, Khan EH, Mahmood K, Rahman DL, Ahmed M. Effect of Infrared Radiation (IRR) on Patients with Bell's Palsy. *Bangladesh Medical Journal*. 2017 Nov 21; 46(1):1-6.
- [14] Khanzada K, Gondal MJ, Qamar MM, Basharat A, Ahmad W, Ali S. Comparison of efficacy of Kabat rehabilitation and facial exercises along with nerve stimulation in patients with Bell's palsy. *BLDE University Journal of Health Sciences*. 2018 Jan 1; 3(1):31.
- [15] Qamar MM, Basharat A, Basharat S, Rasul A, Ramzan M, Afzal F, Islam A, Waqas M, Atif MM, Munem HA, Rasheed MA. Kabat Technique incorporated with Kinesiotherapy and electric muscle stimulation can be handy in patients with bell's palsy. *International journal of medicine and applied health*. 2017; 5(1):7-10.
- [16] Alptekin DÖ. Acupuncture and Kinesio Taping for the acute management of Bell's palsy: A case report. *Complementary Therapies in Medicine*. 2017 Dec 1; 35:1-5.
- [17] Ghaus M, Yaqoob I, Kanwal M, Malik AN. Effects of Kabat rehabilitation verses taping to reduce facial disability and synkinesis in Bell's palsy. *Rawal Medical Journal*. 2018 Jul 1; 43(3):543-6.
- [18] Digra PK, Bharti R, Singh N. Proprioceptive Neuromuscular Facilitation in LMN Facial Palsy: A Case Report. *Indian Journal of Physiotherapy & Occupational Therapy*. 2020 Jul 22; 14(3):171-4.
- [19] Ramos-Jimenez A. Effectiveness of Electro-stimulation as a Treatment for Bell 's palsy: An Update Review.
- [20] *Electro-Physical Therapy, Second Edition*, Alain
- [21] Hu K, Taw LB. Integrative East-West Approach to Acute Treatment of Bell 's palsy. *Proceedings of UCLA Healthcare*. 2016; 20.
- [22] Safi MF, Wright-Harp W, Lucker JR, Payne JC, Harris O. Effect of Neuromuscular Electrical Stimulation on Labial and Lingual Weakness. *Topics in Geriatric Rehabilitation*. 2018 Apr 1; 34(2):145-54.
- [23] Choi JB. Effect of neuromuscular electrical stimulation on facial muscle strength and oral function in stroke patients with facial palsy. *Journal of physical therapy science*. 2016; 28(9):2541-3.
- [24] Kumar C, Bagga TK. Comparison between proprioceptive neuromuscular facilitation and neuromuscular re-education for reducing facial disability and synkinesis in patients with Bell's palsy: A randomized clinical trial. *Int J Phys Med Rehabil*. 2015; 3(4):1-8.
- [25] Marotta N, Demeco A, Inzitari MT, Caruso MG, Ammendolia A. Neuromuscular electrical stimulation and shortwave diathermy in unrecovered Bell palsy: A randomized controlled study. *Medicine*. 2020 Feb;99(8).
- [26] Goldie S, Sandeman J, Cole R, Dennis S, Swain I. Electrical stimulation treatment for facial palsy after revision pleomorphic adenoma surgery. *Journal of surgical case reports*. 2016 Apr 1; 2016(4).
- [27] Qamar MM, Basharat A, Basharat S, Rasul A, Ramzan M, Afzal F, Islam A, Waqas M, Atif MM, Munem HA, Rasheed MA. Kabat Technique incorporated with Kinesiotherapy and electric muscle stimulation can be handy in patients with Bell 's palsy. *International journal of medicine and applied health*. 2017; 5(1):7-10.
- [28] Alyassiri AM, Zaidan TF. Comparison between the beneficial Effects of Low Level Laser Therapy (Diode Laser) and Transcutaneous Electrical Nerve Stimulation in Recovery of Patients with Bell's palsy. *Indian Journal of Forensic Medicine & Toxicology*. 2019; 13(1):332-7.
- [29] Fargher, K.A. and Coulson, S.E.,. Effectiveness of electrical stimulation for rehabilitation of facial nerve paralysis. *Physical Therapy Reviews*, 2 2017(3-4), 169-176.
- [30] Puls WC, Jarvis JC, Ruck A, Lehmann T, Guntinas-Lichius O, Volk GF. Surface electrical stimulation for facial paralysis is not harmful. *Muscle & Nerve*. 2020 Mar; 61(3):347-53.
- [31] Al Shalawi, A.A., Effect of Tens in the Management of Bell's Palsy-Case Study.
- [32] Bafna, G. and Kumawat, A., Prevalence of nerve conduction study to determine the prognostic value in Bell's palsies patients
- [33] Croisé, B., Paré, A., Marmouset, F., Bregeaut, P., Joly, A. and Laure, B., 2019. Lengthening temporalis myoplasty and reduction of the swallowing oral phase dysfunction in facial palsy patients. *Journal of Plastic, Reconstructive & Aesthetic Surgery*, 72(7), pp.1157-1163.
- [34] Fabrin, S., Soares, N., Regalo, S.C.H. and Verri, E.D., 2015. The effects of acupuncture on peripheral facial palsy sequelae after 20 years via electromyography. *Journal of acupuncture and meridian studies*, 8(5), pp.245-248
- [35] Frigerio, A., Heaton, J.T., Cavallari, P., Knox, C., Hohman, M.H. and Hadlock, T.A., 2015. Electrical stimulation of eye blink in individuals with acute facial palsy: progress toward a bionic blink. *Plastic and reconstructive surgery*, 136(4), pp.515e-523e
- [36] Khair, A.M. and Ibrahim, K., 2018. Idiopathic non-traumatic facial nerve palsy (Bell's palsy) in neonates; an atypical age and management dilemma. *Oman medical journal*, 33(1), p.65.
- [37] Lylykangas, J., Ilves, M., Venesvirta, H., Rantanen, V., Mäkelä, E., Vehkaoja, A., Verho, J., Lekkala, J., Rautiainen, M. and Surakka, V., 2019, May. Electrical stimulation of eye blink in individuals with dry eye symptoms caused by chronic unilateral facial palsy. In *International Conference on Medical and Biological Engineering* (pp. 7-11). Springer, Cham.
- [38] Mäkelä, E., Venesvirta, H., Ilves, M., Lylykangas, J., Rantanen, V., Ylä-Kotola, T., Suominen, S., Vehkaoja, A., Verho, J., Lekkala, J. and Surakka,

- V., 2019. Facial muscle reanimation by transcutaneous electrical stimulation for peripheral facial nerve palsy. *Journal of medical engineering & technology*, 43(3), pp.155-164.
- [39] Mathew, A.K., Hameed, S., Rawther, N.N., Shaji, J. and Mathai, R., 2020. Idiopathic facial paralysis and tens therapy-A case report. *The Journal of Medical Research*, 6(2), pp.48-50.
- [40] Priya, B.S., Srinivasan, K.R., Lakshmanan, P. and Selvi, P., 2017. Facial Nerve Injury Following TMJ Surgery and its Management by Electrical Stimulation—A Case Study. *Biomedical and Pharmacology Journal*, 10(4), pp.1855-1861
- [41] Ton, G., Lee, L.W., Ng, H.P., Liao, H.Y., Chen, Y.H., Tu, C.H., Tseng, C.H., Ho, W.C. and Lee, Y.C., 2019. Efficacy of laser acupuncture for patients with chronic Bell's palsy: A study protocol for a randomized, double-blind, sham-controlled pilot trial. *Medicine*, 98(15).
- [42] Brenner MJ, Neely JG. Approaches to grading facial nerve function. In *Seminars in plastic surgery* 2004 Feb (Vol. 18, No. 1, p. 13). Thieme Medical Publishers.



ORIGINAL ARTICLE**PROCLIVITY OF E-READING VERSUS PRINTED
AMONG GENERATION Z****ABSTRACT****BACKGROUND AND AIMS**

In present era people use many digital learning resources for education purposes and for getting extra knowledge, it promote healthy environment and also convenience in contrast to printed material. This growing trend impact on cognition and understanding of the user differently.

OBJECTIVE

This study aims to determine the frequency of students who prefer reading on printed text or other digital text and its effects on reading approaches.

METHODOLOGY

This study included a total of 250 samples using a convenient sampling technique. This study was carried out at different Colleges of Rehabilitation Sciences with the age limit of 19-23 year. The data was obtained by self-designed questionnaire based on 15 close ended questions.

RESULT

45.2% of the students prefer reading printed text while 17.2% of the students prefer digital text. Majority of the students choose availability 51.6% as the justification for preferring printed or digital text. For learning from gadgets 70.8% of the student's favour cell phones and 2.0% favour computer.

CONCLUSION

The study indicated that printed reading material is still the first choice in the particular geographical area although the digital text is more convenient. There is a need to discover the explanations that constrain or promote the use of such resource that encourages healthy environment.

KEYWORDS

Technology, learning, comprehension, reading and digital text

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INTRODUCTION

The first vital advancements of digital books started during the 1970s with Project Gutenberg and the Oxford Text Archive. Gutenberg project was coined by Michael Hart in July 1971, as a network venture to enable book accessible to all. Although these advances are here to make the world more productive on the other hand printed textbook is a physical book that has texts, images, etc., printed on paper¹.

Along with the historically learned information, there exist various different types of material in information as well as a wide number of modern methods of learning PDF copies of literature and can be extended not just to applications for self-learning, but also for general studying; they can also be used for purpose based education².

The widespread use of internet for obtaining information is widely seen in modern era. In today's time people use many digital learning resources for education purposes and for getting extra knowledge³. Digital text can be characterized as; content in computerized structure; as a book changed over into advance structure⁴. Digital know-how is essential as learning opportunity can arise everywhere, use of smart phones are widely seen for the learning purpose⁵. Text highlighting, highlights the significant concepts, thoughts and ideas and one of the prevalent ways to self-regulate learning from text⁶. Although there is agreement on the beneficial impact of highlighting in print reading, it is notable that some studies have discovered that highlighting may be harmful for the comprehension⁷. Further, numerous universal and national appraisal of understudies proficiency are not exclusively being conveyed carefully but on the other hand are including affordances that are increasingly explicit to advanced media connections⁸. In today's era, moving towards digital text is moreover evident in the insightful world, whereas, today, the use of digital text is continually developing⁹.

New learners emphasized about electronic reading advancements slowly replacing printed textbooks in the coming era¹⁰. The examination analysed the effect of E-books and cell phones in understudies learning and uncovered that having at least two cell phones fundamentally expanded recurrence of getting to E-books, the understudies have investigated their ability to utilizing E-books and portable innovation in the classroom, availability and cost reserve funds were found as an advantage; while usefulness and instructional method were accounted for as downsides to cell phone use¹¹. Furthermore, the emergence of e-books created a paradigm shift in the purchase of textbooks, considering e-book as an alternative to print books.¹² Because of this advancement trend, publishers are motivated to create a book in a variety of formats. The books are published in both print-based and screen-based formats¹³. The

use of computer, laptop, tablets and smart phone are increasingly seen in teenagers, especially the use of smart phones can improve their reading comprehension not the use of paper text¹⁴.

Whereas some studies showed that the students of high school who reads digital text have notable lesser score in comprehension comparing with those with printed text. Likewise, the students of university have also showed the lower comprehension of digital text as compared to printed text¹⁵. one of the study take preferences of community college students regarding retrieve monographs in both printed and digital formats. From 79 completed surveys result indicated that 52% of the participants preferred print text and approximately 39% preferred digital text. While one of the participants (13%) preferred equally both¹⁶.

Another study mention that they use digital devices for daily use in their personal life, whereas 98.6% used for school daily¹⁷. Digital text has many advantages over printed text. They are easy to search their topics, no need to go library, easy to access at any place and any time, it takes minimal space, easy to carry, it has better display to visualize things and is time saving¹⁸. In spite of these various positive advantages of the e-books, there still are viewed as a disputable instrument, which offer ascent to numerous challenges and the inconveniences of the utilization of digital books in the foundation and colleges for a few unmistakable reasons¹⁹. The readers who read from digital text reported increase discomfort and tiredness as compared to those who read from printed text²⁰. When reading from the printed textbook or newspaper article, participants were effective at recalling other applicable information, from the digital verses printed material. Whereas other studies showed that highlighting is good mnemonic strategy by the interpretation of text which enhance memory of attribute and key words⁶.

In this study author analyse about relationships between the analysing of digital versus printed textual content amongst 1,206 South Korean high university college students the results show, University College students had been place to have increased wonderful perceptions of the reading of printed text; studying desire depended on the purpose for studying²¹. Research conducted in 2017 indicates that, the majority students prefer to read printed text²². The study was conducted from Qasim University College of Medicine in 2015-2016. The result of the research is male were 64 (66.7%) and females 32 (33.3%). The consequences of the study demonstrated that the understudies incline toward digital text TBL as a course position, as it was a fascination for a large portion of the understudies and making them much progressively effective in the key test and digital text TBL build up the abilities expected to work gainfully in undertaking gatherings²³.

Study conducted in 2017 shows that about 92% said

they thought best when reading in print, and more than four-fifths reported that whenever cost were the equivalent, they would prefer toward print text for both homework and reading comprehension²⁴. At Study conducted by saleh show that (72%) of the participants preferred printed text and (28%) of the participants preferred digital text. So, it seems that digital book development is moderate yet most of the perusers accept that later on digital book become more prominent than printed books.²⁵ Study conducted in 2016 shows that Digital text was discovered to contain engaging reading characteristics that assist learners to enhance their understanding of reading. This research therefore concludes that digital text is a gradually helpful tool for reading understanding²⁶. A study was conducted to identify if portable digital textbooks would increase the motivation of university students to read by improving cognitive learning strategies and self-regulation of learning. The findings indicate that students use more likely digital text to self-regulated learning strategies than the students using printed textbook²⁷.

The research was conducted in Israel during the first semester of the 2015 academic year shows that males' academic electronic preference is greater than that of females.²⁸ Study conducted in 2015 illustrate that there is a significant difference between the study groups in academic achievement favour to students using E books which increases their motivation towards the academic and concludes that E - book is more beneficial for the students which makes their life easier.²⁹ Study was conducted in UK on students the sample size of 1700 students in which 82% of the students used smart phones and tablets occasionally and for the study purpose while 18% of the students uses printed books for their assignments the evidence portrait a demanding picture where the combination of hand held digital device being used in flux meanwhile course learning device need to better allow a student flexibility and technology.³⁰ The study conducted from years 2000-2017 analysis revealed that the printed book reading has significant comprehension outcomes than digital reading³¹. The study conducted to identify the relationship between meta-cognitive experiences and learning for digital text versus printed text. This research has shown that better readers exhibit more meta-cognitive knowledge than poor readers and strategy instruction improve by reading ability³². Study conducted in 2015 conclude that that college students prefer printed books to digital books in both reading format for pleasure and in reading for school³³. Study conducted by miller is to identify perceptions of college students of digital textbook and student accepted that the printed course readings were more helpful than computerized course books³⁴. Numerous advantage available in E book increases the prediction that reading E books are advantageous learning tools that that foster fruitful learning experience³⁵.

The objective of our study is to find out the frequency

of the students who favor perusing reading on printed text and those who favor perusing reading on digital text and also to find out the different effects on reading approaches.

Rationale

The emergence of the concept of a "paper-free world" demands a transition from the conventional paper-text approach to digital learning. Our research helps to establish how far the modern age readers have gotten in contributing to a paper free world.

METHODOLOGY

Research Design

Cross sectional, observational

Population

Age limit 19-23 years

Sample Size

250

Inclusion Criteria

Current DPT students.

Exclusion Criteria

Participants who are unwilling to take part in the study

Ethical Consideration

Informed consent will be taken from participants with adequate level of privacy and confidentiality of participants maintained.

Data Collection Tool and Procedure

The point of this exploration is to determine the student's preference for E-Reading versus Printed texts. This research was carried out at Colleges of Rehabilitation Sciences in the academic year of 2020 on students. The study design of our research is cross-sectional. The targeted population of this research were students. A total of 250 sample was included in this study, by using convenient sampling technique. The Data was collected by using Self-administered questionnaires from students. The questionnaire composed of 15 close ended questions which include questions regarding Demographic data of participants (Name, Age, Batch, Semester), preference of printed text and digital text, including both advantages and disadvantages of digital text and printed text, health problems/issues (headache, eyes strain, muscle strain, abnormal posture), Effectiveness (effects of digital text and printed text on recalling capacity and comprehension) preference of digital text and printed text, if the cost of both is same and awareness of students regarding world paper free day.

Data Analysis

After completing data collection procedure, the data was entered and analysed into SPSS software 20. Descriptive statistics are used to characterize the

sample, both as a whole and academic stratified. This includes the measures of frequencies, percentages and mean ± SD, t-tests and chi-square. No personal data or information was collected from participants as well ensuring the ethical considerations: The study was explained to the participants and the participant was voluntarily involved.

RESULTS

The result of this study shows that the majority of the students prefer printed text which is 45.2% whereas preference of digital text is 17.2% this indicates that the time frame have not changed the preferences of the students and the ratio of both preference is 37.6%. When we ask from students what was the reason of choosing above preference (printed text or digital text), most of the students select availability (51.6%), easy to carry (31.2%), light in weight (10.4%) and cost effectiveness (6.8%).

(Table: 1)

Prefer to read					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	printed text	113	45.2	45.2	45.2
	digital text	43	17.2	17.2	62.4
	both	94	37.6	37.6	100.0
	Total	250	100.0	100.0	

(Table: 2)

Why to prefer above selective option?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cost effective	17	6.8	6.8	6.8
	light in weight	26	10.4	10.4	17.2
	easy to carry	78	31.2	31.2	48.4
	availability	129	51.6	51.6	100.0
	Total	250	100.0	100.0	

In the modern era students must use electrical gadgets as a learning tool. When we ask from students' which gadget they prepare to use for learning. Most of the students select cell phone (70.8%), laptop (20.4%), tablet (6.8%) and computer (2.0%). When the students were asked about which learning text is time consuming 47.6 % of the students believe that it is time devouring to read printed text while, 52.4% of the students believe that reading digital text takes time.

(Table: 3)

Devices you used for digital text reading learning?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cell phones	177	70.8	70.8	70.8
	tablets	17	6.8	6.8	77.6
	laptop	51	20.4	20.4	98.0
	computer	5	2.0	2.0	100.0
	Total	250	100.0	100.0	

(Table: 4)

Which type is time consuming?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	printed text	119	47.6	47.6	47.6
	digital text	131	52.4	52.4	100.0
	Total	250	100.0	100.0	

The increased use of digital text has caused discomforts in students. Approximately the students experience eyes strain (44%), experience headache (36%), feels that sitting in an abnormal posture creates problem (12%) and muscle strain (8%) When we ask from students regarding improvement of memory/recalling capacity while reading from printed text 84.4% students agree that their memory/recalling capacity enhance with digital text reading whereas 15.6% students was not agreed.

(Table: 5)

Feel any health issue after reading digital text for longer time?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Headache	90	36.0	36.0	36.0
	eyes strain	110	44.0	44.0	80.0
	muscle strain	20	8.0	8.0	88.0
	abnormal posture	30	12.0	12.0	100.0
	Total	250	100.0	100.0	

(Table: 6)

Reading printed text increase your memory/recalling capacities?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	211	84.4	84.4	84.4
	no	39	15.6	15.6	100.0
	Total	250	100.0	100.0	

Regarding the effects of digital text reading on their comprehension most of the students experience no effect on comprehension (49.9%), other experience increments in comprehension (36%) and decrease in comprehension (14%) (Table: 7). When we ask from student's which text improves your learning efficacy most of the students choose printed text (52.0%), both text (38.4%) and digital text (9.6%).

(Table: 7)

Do you believe comprehension is affected by digital text reading?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	increases my comprehension	90	36.0	36.0	36.0
	decreases my comprehension	35	14.0	14.0	50.0
	no effect on my comprehension	124	49.6	49.6	99.6
	4.00	1	.4	.4	100.0
	Total	250	100.0	100.0	

(Table: 8)

Which reading text improves your learning efficacy?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	printed text	130	52.0	52.0	52.0
	digital text	24	9.6	9.6	61.6
	both	96	38.4	38.4	100.0
	Total	250	100.0	100.0	

When we ask from students regarding the disadvantages of printed text, most of the students select printed text is heavier in size to carry (40.8%), expensive (24.8%), take lot of space (17.6%) and there is no option to increase text size (16.8%) As well when we ask from students regarding the disadvantages of digital text, most of the students has chosen eye strain (48.4%), battery issues (24.4%), distraction for reader (20.8%) and loss of information all of sudden (6.0%).

(Table: 9)
What are the disadvantages of reading printed text?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid heavier in size, to carry around	102	40.8	40.8	40.8
no option to increase size of text	42	16.8	16.8	57.6
Expensive	62	24.8	24.8	82.4
take up a lot of space	44	17.6	17.6	100.0
Total	250	100.0	100.0	

(Table: 10)
What are the disadvantages of reading digital text?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid battery issues	61	24.4	24.4	24.4
causes eye strain	121	48.4	48.4	72.8
loss of information all sudden	15	6.0	6.0	78.8
can be distracting for the reader	52	20.8	20.8	99.6
234.00	1	.4	.4	100.0
Total	250	100.0	100.0	

When we ask from the students about the awareness of World paper free day, most of the students had no awareness (76.8%), whereas the rest of the students were aware of World paper free day (23.2%) 39.2% students believe that the use of printed text should be reduced to keep the World paper free whereas 60.8% students believe that the use of printed text should not reduce.

(Table: 11)

Do you know about world paper free day?				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid yes	58	23.2	23.2	23.2
no	192	76.8	76.8	100.0
Total	250	100.0	100.0	

(Table:12)
Do you agree to keep World paper free; the use of printed books should be reduced?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid yes	98	39.2	39.2	39.2
no	152	60.8	60.8	100.0
Total	250	100.0	100.0	

DISCUSSION

The results of this study show most students prefer printed text over digital text. Such studies supported the results of this study in Tsai, C.C 2016, the preference of male and female groups of students were printed text instead of digital text.

In the study Carey, J. 2019 among the students of two year and four-year college printed text were preferred most over the digital text¹⁶. In one more study Millar, M. 2015 results showed the students prefer printed text over digital text³⁴.

In our research, most of the students feels that eyestrain is the main health issue after reading digital text for a longer period of time and many researches

related to this are also conclude this, the result of one of the research survey conducted by Kopper M.May-or S. & Buchner A in 2016 concluded that participants expressed a strong preference of eyestrain symptom after reading digital text³⁵.

In the study Manlu B H in 2017 investigates that screen light is one of the significant reasons of eye strain. To prevent from eye fatigue people who read digital text a lot recommend applying a 20/20/20 rule which is taking a 20 sec break in every 20 min by looking at something 20 feet away from you³⁶.

Regarding learning efficacy 52.0% students choose printed text. According to the researcher Scott. Morris, A., & Marais, B.37 who conduct a research in 2017 in which they find a data through questionnaire and student confirmed the extensive use of digital resources for self-directed learning also has the impact of contemporary learning habits on learning efficacy.

Regarding disadvantages of printed text most of the students says that in reading printed text they can't increase the font size, heavier in size, take up lot of space, expensive and according to palsdotir who conduct research in 201938-39.

CONCLUSION

The frequency of the student's preference for printed text is 45.2%, whereas 17.2% of the students opted for digital text, while 37.6% of the students on the other hand, and choose both. The findings of our research are evident by several studies. Concerning the drawbacks of printed text most of the students select printed text because it is heavier to carry around, whereas most of the students choose eye strain as a drawback of reading digital text.

REFERENCE

- [1] Bhatt A. A Modern Law Library Action: The Future of Digital Books in Indian Law Schools. International Journal of Allied Practice, Research and Review. 2018; 5(1):1-5.
- [2] Tsai CC. A Case study of english-Major students' Preferences for english reading from a Printed text versus electronic text. Stanisław Juszczyk. 2016 Dec 31:142.
- [3] Akçayır M, Dündar H, Akçayır G. What makes you a digital native? Is it enough to be born after 1980? Computers in Human Behavior. 2016 Jul 1; 60:435-40.
- [4] Cheng Y, Dong C, Liu R. The coexistence of printed book and electronic book in a book supply chain. In2017 IEEE International Conference on Industrial Engineering and Engineering Management (IIEEM) 2017 Dec 10 (pp. 1421-1425). IEEE.
- [5] Santoso TN, Siswandari S, Sawiji H. The Effectiveness of eBook versus Printed Books in the Rural Schools in Indonesia at the Modern Learning Era.

- International Journal of Educational Research Review. 2018; 3(4):77-84.
- [6] Yue CL, Storm BC, Kornell N, Bjork EL. Highlighting and its relation to distributed study and students' metacognitive beliefs. *Educational Psychology Review*. 2015 Mar 1; 27(1):69-78.
- [7] Willingham DT, Hughes EM, Dobolyi DG. The scientific status of learning styles theories. *Teaching of Psychology*. 2015 Jul; 42(3):266-71.
- [8] Leu DJ, Kinzer CK, Coiro J, Castek J, Henry LA. New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment. *Journal of Education*. 2017 Apr;197(2):1-8
- [9] Parkes M, Stein S, Reading C. Student preparedness for university e-learning environments. *The Internet and Higher Education*. 2015 Apr 1; 25:1-0.
- [10] Lau KH, Lam T, Kam BH, Nkhoma M, Richardson J, Thomas S. The role of textbook learning resources in e-learning: A taxonomic study. *Computers & Education*. 2018 Mar 1; 118:10-24.
- [11] Al-Emran M, Elsherif HM, Shaalan K. Investigating attitudes towards the use of mobile learning in higher education. *Computers in Human behavior*. 2016 Mar 1; 56:93-102.
- [12] Seal PP. The Choice between EBooks and Printed Books: A Study among Hospitality and Tourism Educators and Learners. *Choice*. 2020 Jan 27.
- [13] Lestari KD. Screen Book Versus Printed Book: A Comparative Study on the Influence of Students Perceived Learning at six semesters on English department in University of Muhammadiyah Gresik. *Journal of English Teaching, Literature, and Applied Linguistics*. 2020 Aug 9; 4(2):73-83.
- [14] Yachina NP, Valeeva LA, Sirazeeva AF. E-Teaching Materials as the Means to Improve Humanities Teaching Proficiency in the Context of Education Informatization. *International Journal of Environmental and Science Education*. 2016; 11(4):433-42.
- [15] Sidi Y, Ophir Y, Ackerman R. Generalizing screen inferiority-does the medium, screen versus paper, affect performance even with brief tasks?. *Metacognition and Learning*. 2016 Apr 1;11(1):15-33
- [16] Carey J, Pathak A. Book Format Preferences of Community College and Four-Year College Students: Results from Two Urban Campuses. *Urban Library Journal*. 2019; 25(1):2.
- [17] Washburn S, Herman J, Stewart R. Evaluation of performance and perceptions of electronic vs. paper multiple-choice exams. *Advances in physiology education*. 2017 Dec 1; 41(4):548-55.
- [18] Koh, H. and Herring, S. Historical insights for e-book design. *Library Hi Tech*, (2016). 34(4), pp. 764-786.
- [19] Oyaid A, Alshaya H. Saudi University Students Views, Perceptions, and Future Intentions towards E-Books. *Malaysian Online Journal of Educational Technology*. 2019;7(1):69-75.
- [20] Rosenfield M. Computer vision syndrome (aka digital eye strain). *Optometry in Practice*. 2016 Feb 16;17(1):1-0.
- [21] Seok S, DaCosta B. Gender differences in teens' digital propensity and perceptions and preferences with regard to digital and printed text. *TechTrends*. 2017 Mar 1;61(2):171-8.
- [22] Ross B, Pechenkina E, Aeschliman C, Chase AM. Print versus digital texts: understanding the experimental research and challenging the dichotomies. *Research in Learning Technology*. 2017 Nov 3;25.
- [23] Sharaf F, Alnohair S. Comparison of medical students' learning approaches between electronic and hard copy team-based learning. *International journal of health sciences*. 2017 Jan;11(1):1.
- [24] Baron NS, Calixte RM, Havewala M. The persistence of print among university students: An exploratory study. *Telematics and Informatics*. 2017 Aug 1;34(5):590-604.
- [25] Saleh ZI, Mashhur AS. The Impact of e-Books on the Printed Books: e-Books Popularity, Growth and Future. In 2015 Fifth International Conference on e-Learning (econf) 2015 Oct 18 (pp. 125-130). IEEE.
- [26] Reid, C. e-books and Print Books Can Have Different Effects on Literacy Comprehension. *Education master*, (2016). pp. 325
- [27] Rockinson-Szapkiw AJ, Wendt J, Lunde R. Electronic versus print textbooks: The influence of textbook format on university students' self-regulated learning strategies, motivation, and text anxiety. *American Journal of Distance Education*. 2013 Jul 1;27(3):179-88.
- [28] Aharony, N and Bar-Ilan, J. Students' academic reading preferences. *Journal of Librarianship and Information Science*, (2018). 50(1), pp. 3-13
- [29] Ebied MM, Rahman SA. The Effect of Interactive e-Book on Students' Achievement at Najran University in Computer in Education Course. *Journal of Education and Practice*. 2015;6(19):71-82.
- [30] Cross, Simon; Sharples, Mike and Healing, Graham (2016). Learning with mobile devices: the changing place and space of distance learners' study. In: EDULEARN16 Proceedings, pp. 5385-5393.
- [31] Delgado P, Vargas C, Ackerman R, Salmerón L. Don't throw away your printed books: A meta-analysis on the effects of reading media on reading comprehension. *Educational Research Review*. 2018 Nov 1;25:23-38.
- [32] Norman E, Furnes B. The relationship between metacognitive experiences and learning: Is there a difference between digital and non-digital study media? *Computers in Human Behavior*. 2016 Jan 1; 54:301-9.
- [33] Byars, M.N. (2015). Printed Books versus Digital Books. *Digital Commons Cal Poly*, pp. 1-35.
- [34] Millar M, Schrier T. Digital or printed textbooks: which do students prefer and why? *Journal of Teaching in Travel & Tourism*. 2015 Apr 3; 15(2):166-85.

- [35] Köpper M, Mayr S, Buchner A. Reading from computer screen versus reading from paper: does it still make a difference?. *Ergonomics*. 2016 May 3;59(5):615-32.
- [36] Manalu BH. Students' Perception of Digital Texts Reading: A Case Study at the English Education Department of Universitas Kristen Indonesi. *JET (Journal of English Teaching)*. 2019 Oct 28; 5(3):191-203.
- [37] Scott K, Morris A, Marais B. Medical student use of digital learning resources. *The clinical teacher*. 2018 Feb; 15(1):29-33.
- [38] Pálsdóttir, Á. (2019). Advantages and disadvantages of printed and electronic study material: perspectives of university students *Information Research*, 24(2), paper 828.
- [39] Alhammad R, Ku HY. Graduate students' perspectives on using e-books for academic learning. *Educational Media International*. 2019 Jan 2;56(1):75-91



ORIGINAL ARTICLE

PREVALENCE OF COMPUTER VISION SYNDROME AMONG UNDERGRADUATE PHYSICAL THERAPY STUDENTS

ABSTRACT**BACKGROUND AND AIMS**

Computers and other digital screens have become an integral part of our life. It raises various ocular problems in the user due to excessive screen time, this study aims to determine the frequency of computer vision syndrome (CVS) in population of under graduate physical therapy student.

METHODOLOGY

This was cross-sectional study conducted at Ziauddin College of Rehabilitation Sciences; Karachi during June 2019 to September 2020. A total number of 340 candidates of age 22 years \pm 1.8 including both genders participated in this study. A questionnaire was designed to collect data which was statistically analyzed on SPSS version 20. Whereas descriptive data was calculated as mean, median, mode and standard deviation using graphical representations.

RESULTS

88.5% of the students used mobile phones for study purpose out of which 35.3% use it for 4-7 hour and 33% use for 7 to 10 hours a day. The ocular symptoms that students face was burning of eyes (40%), tearing (55%), eye redness (45.3%), diplopia 31.8%, blurred vision (42.9%), eye dryness (23.8%), while extra ocular symptom that was noticed in the study included headache too was (67.9%).

CONCLUSION

This study showed that most of the students were found to have a CVS thus screen time guide lines and visual rehabilitation must established.

KEY WORDS

Vision, Syndrome, Prevalence, Headache, Diplopia, Computer

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INTRODUCTION

Among all of technical devices computer is the one that has eased every individual life with many benefits. But besides that this gadget has other disadvantages along with it. Nowadays computer related health problems are common due to the usage of computer for long duration. Prolonged exposure to VDTs (Video Display Terminal) has been the cause of a visual and ergonomic disorder called "Computer Vision Syndrome". Individuals who work on a computer for long time complain musculoskeletal and eye related disorders like ocular discomfort, eye strain, muscle spasm, cervicogenic headache¹. According to American Optometric Association computer vision syndrome is an optical disorder that causes stress and fatigue on the eye muscles. The prevalence of this disease is increasing drastically. This disorder is most commonly observed in students who use digital screens for more than 2 hours². Many researches have been done to rule out the prevalence of CVS among different people in their respective occupations. Some of these occupations include office workers, medical students, higher education students and technology professionals etc. It is estimated that over 60 million people have computer vision syndrome³. Another study reported (70.5%) prevalence of visual symptoms among computer users⁴ while 73% is the prevalence estimated by the studies of this syndrome⁵. Another study which has been done on students of Saudia Arabian University the prevalence was seen 72% with acute symptoms of CVS⁶ Increase prevalence of computer vision syndrome due to excessive technology usage results in the loss of productivity and disturbed quality of life⁵. Another research finding among information technology students in a rural engineering college has reported that the prevalence of CVS was 55.4% and among those people 79.3% were the ones who worked on computer more than 3 hours a day⁷.

Prevalence of computer vision syndrome was found to be high among students due to continuous usage of computer for more than 3 hours. Those individuals who use computer more than three hours without break are most likely to get computer vision syndrome⁸ those people who use computer with spectacles and contact lenses are more prone to have computer vision syndrome.⁹

In a study conducted by Jahan, F et al in 2018, three mechanism were explained about extra ocular mechanism, accommodative mechanisms and ocular surface mechanisms¹⁰. CVS Shows mainly eye symptoms i.e. eye strain, dry or watery eyes with redness, burning of eyes, other issues associated with prolong computer using are fatigue, headache shoulder stiffness and also low back pain¹¹.

A study reported a 70% increase in intra ocular pressure after using computer for more than 4 hours¹². Headache, blurred vision and tearing, burning of

eyes, watering of eyes, photophobia, itching, neck and shoulder pain, and contact lens troubles are the most common problems.¹³ Head ache, burning eyes, photophobia, blurred vision, shoulder pain all these symptoms collectively known as Computer Vision Syndrome. People felt sandy gritty eye irritation; headache, fatigue and excess eye redness and damage to cornea due to CVA.¹⁴ As the computer screen sets above the eye level it can cause eye muscle strain. Amount of glare and light exposure, gaze and font size also become the causative factor for external symptoms of CVS. Due to CVS students felt sandy gritty eye irritation, headache, fatigue and excess eye redness and damage to cornea¹⁵. Posture can lead to Eye fatigue in frequent computer users¹⁶. About three-fourths of computer-using bank workers suffered from CVS due to their ergonomically malpractice⁹.

People use all the digital screens frequently at a very close distance and varying gaze angles, which should be 40 cm approximately and it seems likely CVS is going to increase in our society day by day¹⁷.

Few steps can minimize the symptoms of CVS such as usage of digital gadgets at a very close distance should be avoid and the distance of the screen from the eye should be 40 cm, while screen angle should also be adjusted at 15 degree in a horizontal plane. The Anti-glare screen filters are also available that can be useful for viewing the screen, along with taking regular breaks between work may relax eye muscles. The 20:20:20 rule¹⁸ (i.e., viewing a target at least 20 feet away for at least 20 seconds every 20 minutes) provides a valuable and easily memorized guideline.¹⁹ Diet can also play a role in recovering from CVA such as Omega-3 fatty acid decreases the tear which can help the patient. While basic economical approach is triphala eye drops and saptamritalauha in the management of CVS¹⁸. CVS can be prevented by the adjusting the monitor below the eye level, short breaks, eye massage and use of eye lubricants¹⁹. A study demonstrated that there is a need for awareness in students about ergonomics and related measurements need to be implemented to decrease the rate of increasing CVS²⁰. Moreover, the room lights should be much brighter when you are working on digital screen and the contrast of the screen should be high to avoid eye strain. People who have any refractive error should wear glasses when they are using digital screens. It is concluded in this study that by taking these preventions people can overcome CVS.²¹

METHODOLOGY

Study Settings

This study was conducted among students of Ziauddin College of Rehabilitation Sciences, Ziauddin University.

Target Population

Students of Doctor of Physical Therapy (DPT) was

targeted for this study.

Study Design

The design of study was cross sectional.

Sample Size

A sample was 340 students from ZCRS.

Duration

The data was collected in duration of a month.

Data Analysis

All the data was analyzed on the basis of data frequencies using SPSS Data Analysis Techniques (SPSS version 20th).

Inclusion Criteria

Students of Doctor of Physical Therapy (DPT).
The students of age group 17-25 were included in this research study .
Students using digital gadgets more than 2 hours per day.

Exclusion Criteria

Those who have some eye infections were excluded from this study.⁸
Students with preexisting eye diseases.
Those whose were unwilling to participate.
Students who used drugs for systemic diseases will be excluded.

Data Collection Tool

Computer Vision Syndrome Questionnaire (Cvs-Q)
Data was collected through adapted computer vision syndrome questionnaire comprised of 21 questions.

Data Collection Procedure

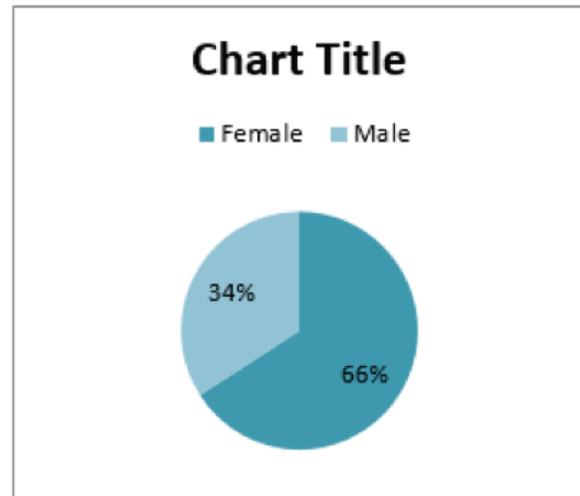
The data was collected from undergraduate physical therapy students of Ziauddin College of Rehabilitation Sciences. After taking the consent from the participants, questionnaire was distributed among them and was asked to return at the same time. It required only 5-7 minutes for filling it.

Data Analysis

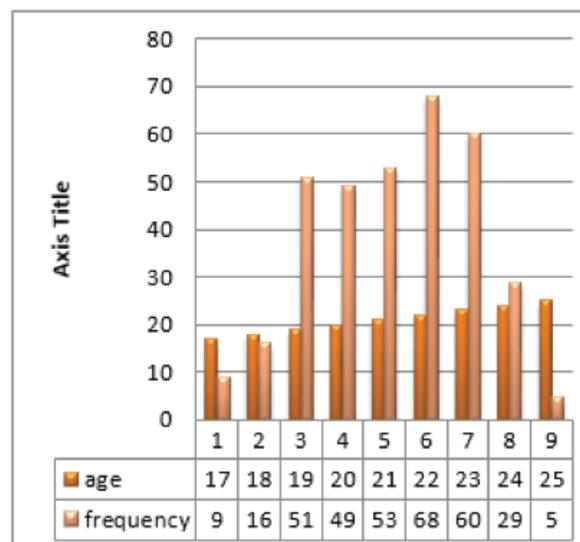
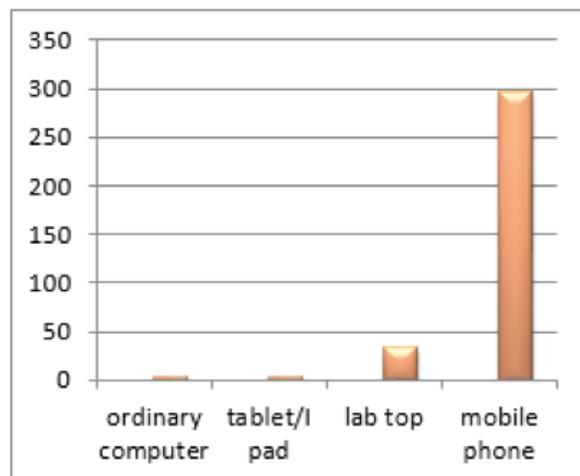
Data was analyzed through frequency distribution using SPSS Data Analysis Techniques (SPSS version 20th).

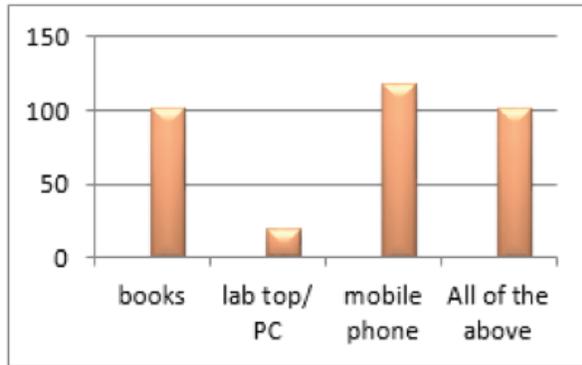
RESULTS

In the study, 340 students were enrolled, out of which who have any type of eye infections, eye disease or taking any drugs for systemic disease and unwilling to participate were already excluded from the study before the collection of the data.



The study was conducted among students of age 17 and 25 years of age who had used screen for studying. These participants included both males and females; out of which 65.9 % were female and 34.1 % were male.as shown in figure 1.

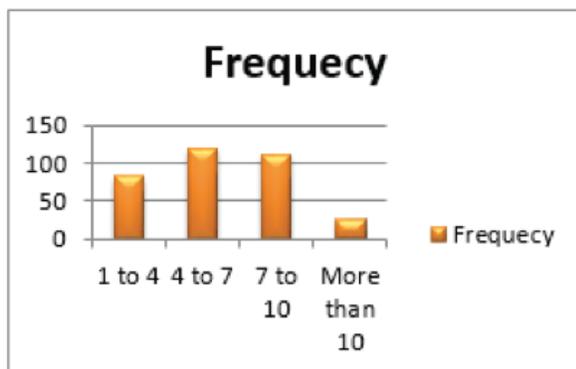




The age range of 17 years to 25 years was targeted out of which the computer vision syndrome was found to be most common among the age of 22 years as shown in graph.1

The study showed that out of 340 students 88.5% were those who used mobile phones more frequently and preferred mobile phones to study as well. As shown in graph 2.

By calculating the result of question that what an individual prefer for study, out of 340 respondents, 118 (34.7%) respondents preferred mobile phones, 102 (30%) preferred books to study while 101 (29.7%) preferred all of these ways for their study. As shown in graph 3.



The respondents in the study were asked to mention the duration of their sitting time when looking in front of screen the response was mostly 4-7 hours (35.3%) while some of them respond that they spend 7-10 hours (32.9%). Shown in graph 4.

Variable	Prevalence Rate
Male	39.65%
Female	71.87%
Total	61%

The total number of students who were enrolled in the study was 340 out of them 207 (61%) lie in the category of presence of computer vision syndrome. In comparison of male and female ration, female are

more prone for CVS with the ratio of 71.87% while 39.65% male are affected. Shown in table.1

DISCUSSION

The study was conducted among the undergraduate medical students of urban Karachi regarding the prevalence of computer vision syndrome and its associated risk factors, result reveal that 67.2% students suffered from this Computer Vision Syndrome. A similar study was conducted in Saudi Arabia in 2017 shows about 72% prevalence rate of Computer Visionary Syndrome among the students.⁶ Another study reported (70.5%) prevalence of visual symptoms among computer users⁴. This study point out the most common ocular symptoms like eye irritation that is about 48%, while burning sensation in eyes is around 33%, and eye fatigue about 15%. In one of the previous study conducted in Karachi shown that headache (38%) was one of the most common symptoms that students suffered in extra ocular symptoms include headache 38% and neck shoulder pain 21%.⁵ One of the previous study was also reported 70% increase in intra ocular pressure after using computer for more than 4 hours¹³ as this study was found that ocular symptoms like burning in eyes 40%, itching in eyes 30.3%, 34.7% claim that they face tearing during the work, eye redness 45.3%, 55.3% claims that they feel pain in eye while sitting in front of the screen, studying from any digital screens causes blurred vision 42.9%, double vision 31.8%.

Around all of them have some of the symptoms like dry eyes, shoulder and neck pain, eye strain, double and blurred vision, were using the computer for more than 6 hours in a day²² Among extra ocular symptoms headache (72.4%) was found to be the most common in a study that was conducted in Islamabad²³. In one of the study that was conducted in Karachi reports that headache (38%) was one of the most common symptoms in students⁵. While this study also shows that the number of students that suffered from headache were 67.9%, this extra ocular symptom was in accordance with our study. In previous studies researchers stated that the most commonly reported complaint was headache (54.5%), followed by pain (33.9%) whereas, the least common complaint was double vision (3.6%)²⁴. One of the previous study that was conducted in 2018 reported that eye related problems such as dry or watery eyes, redness, strain along with headache and shoulder stiffness are commonly present. As in this study around 61% students had complained for CVS.¹²

This study revealed that the students spending around 4-7 hours in front of computer screens while some respondent spending around 7-10 hours screening time. A study conducted in 2019 shown students consuming more than 3 hours in front of their computer were suffered in computer visionary syndrome.⁸ Another study's results showing that increase in intra ocular pressure was reported in person who use the

more than a 4 hours. 13 88.5% student in this study was used mobile phone more frequently for their studies and also for other purpose.

The total prevalence rate of Computer visionary Syndrome was high among the students. Furthermore the ratio between male and female found that the female population was significantly more affected than the male students. One of the previous studies shows that the high prevalence rate in female population²⁴⁻²⁷.

Human eyes need to adjust themselves in order to see objects from different distances, such as by changing the size of pupil, lengthening or shortening the lens to change eye focus, and contracting extra-ocular muscles to coordinate between two eyes. If computer users need to view computer screen while looking at a paper on the table from time to time, the eyes have to adjust constantly. In addition, the words and images on a computer screen are difficult for the eyes to focus on due to their poor edge resolution. The eyes tend to change the focus to a resting point and then refocus on the screen. For these reasons, constant focusing and refocusing is required. These constant changes take place thousands of times a day when a computer user stares at a computer screen for hours, which then stresses the eye muscles leading to eye fatigue and discomfort causing headache.

Study was limited due to shortage of time. The sample was taken from specific population of students of one university only. Hence it may not depict the whole population of a country. Also, small number of sample was collected which may affect the presence of CVS among students.

CONCLUSION

This study concludes that computer vision syndrome is present among under graduate Physical Therapy student with the prevalence of 60.8%. A majority of students face multiple ocular and extra ocular problems that can lead to CVS. There is an emerging need of visual rehabilitation as well as life style management along with screen time guideline for healthy ocular function and visual processing.

REFERENCES

- [1] Khalaj M, Ebrahimi M, Shojai P, Bagherzadeh R, Sadeghi T, Ghalenoiei M. Computer vision syndrome in eleven to eighteen-year-old students in Qazvin. *Biotechnology and Health Sciences*. 2015 Aug 24.
- [2] Sheppard AL, Wolffsohn JS. Digital eye strain: prevalence, measurement and amelioration. *BMJ open ophthalmology*. 2018 Apr 1;3(1):e000146.
- [3] Parveen N, Hassan SH, Rehman J, Shoukat U. Prevalence of myopia and its associated risk factors in local medical students. *Cell*. 2015 Oct;334:3887822.
- [4] Ranasinghe P, Wathurapatha WS, Perera YS, Lamabadusuriya DA, Kulatunga S, Jayawardana N, Katulanda P. Computer vision syndrome among computer office workers in a developing country: an evaluation of prevalence and risk factors. *BMC research notes*. 2016 Dec;9(1):1-9.
- [5] Noreen K, Batool Z, Fatima T, Zamir T. Prevalence of computer vision syndrome and its associated risk factors among under graduate medical students of urban karachi. *Pakistan Journal of Ophthalmology*. 2016 Sep 30;32(3).
- [6] I Rashidi SH, Alhumaidan H. Computer vision syndrome prevalence, knowledge and associated factors among
- [7] Saudi Arabia University Students: Is it a serious problem?. *International journal of health sciences*. 2017 Nov;11(5):17.
- [8] Mansoori N, Qamar N, Mubeen SM. Dry Eye Syndrome and Associated Risk Factors among Computer Users in Karachi, Pakistan. *ANNALS OF ABBASI SHAHEED HOSPITAL AND KARACHI MEDICAL & DENTAL COLLEGE*. 2017 Sep 30;22(3):165-70.
- [9] Muma S, Aduda DO, Onyango P. Level of Awareness, Perception And Uptake Of Interventions For Computer Vision Syndrome Among University Students, Maseno, Western Kenya..
- [10] Mowatt L, Gordon C, Santosh AB, Jones T. Computer vision syndrome and ergonomic practices among undergraduate university students. *International journal of clinical practice*. 2018 Jan;72(1):e13035.
- [11] Jahan F, ul Islam Z, Rafei M. Factors Leading Computer Vision Syndrome in Medical Students: A Descriptive Analysis.
- [12] Lurati AR. Computer vision syndrome: Implications for the occupational health nurse. *Workplace health & safety*. 2018 Feb;66(2):56-60.
- [13] Qudsiya SM, Khatoon F, Khader AA, Ali MA, Hazari MA, Sultana F, Farheen A. Study of intraocular pressure among individuals working on computer screens for long hours: Effect of exposure to computer screens on IOP. *Annals of Medical Physiology*. 2017 Apr 11;1(1):22-5.
- [14] Iqbal M, El-Massry A, Elagouz M, Elzembely H. Computer vision syndrome survey among the medical students in Sohag University Hospital, Egypt. *Ophthalmology Research: An International Journal*. 2018 Jan 5:1-8.
- [15] Memon QA, Hassan MY. Detecting Computer Vision Syndrome Using Eye Blink—An Experimental Evaluation. In *Journal of Physics: Conference Series* 2018 Sep 1 (Vol. 1098, No. 1, p. 012029). IOP Publishing.
- [16] Priya DB, Jotheeswaran J, Subramaniyam M. Visual Flow on Eye-Activity and Application of Learning Techniques for Visual Fatigue Analysis. In *IOP Conference Series: Materials Science and Engineering* 2020 Aug 1 (Vol. 912, No. 6, p. 062066). IOP Publishing.
- [17] Portello JK, Rosenfield M, Bababekova Y, Estrada

- JM, Leon A. Computer-related visual symptoms in office workers. *Ophthalmic and Physiological Optics*. 2012 Sep;32(5):375-82
- [18] Ranganatha SC, Jaikhan S. Prevalence and associated risk factors of computer vision syndrome among the computer science students of an engineering college of Bengaluru-a cross-sectional study. *Galore Int J Health Sci Res*. 2019;4(3):10-5.
- [19] Reddy SC, Low CK, Lim YP, Low LL, Mardina F, Nursaleha MP. Computer vision syndrome: a study of knowledge and practices in university students. *Nepalese journal of Ophthalmology*. 2013 Sep 23;5(2):161-8.
- [20] (turgut, 2018)Turgut, B., 2018. Ocular Ergonomics for the Computer Vision Syndrome. *Journal of Eye and Vision*, 1(1).
- [21] Logaraj M, Madhupriya V, Hegde SK. Computer vision syndrome and associated factors among medical and engineering students in Chennai. *Annals of medical and health sciences research*. 2014;4(2):179-85.
- [22] Humayun S. The frequency of symptoms of computer vision syndrome among medical college students in Islamabad. *The Professional Medical Journal*. 2020 Sep 10;27(09):1823-8.
- [23] Thilakarathne MM, Udara HM, Thucyanthan B, Ranasinghe P. Prolonged computer use and its effects on vision among undergraduates in University of Colombo, School of Computing.
- [24] Dry Eye Assessment and Management Study Research Group. N- 3 fatty acid supplementation for the treatment of dry eye disease. *New England Journal of Medicine*. 2018 May 3;378(18):1681-90.
- [25] Akinbinu TR, Mashalla YJ. Impact of computer technology on health: Computer Vision Syndrome (CVS). *Medical Practice and Reviews*. 2014 Nov;5(3):20-30..
- [26] Amalia H. Computer vision syndrome. *Jurnal Biomedika dan Kesehatan*. 2018 Sep 27;1(2):117-8.
- [27] Aldawsari SA, Alotaibi AA, Alabdulwahhab KM, Mohamed EY, Abdelmajid S. Knowledge, attitudes and practices of faculty members' about computer vision syndrome, Majmaah University, Saudi Arabia. *International Journal of Community Medicine and Public Health*. 2018 Sep;5(9):3801.



ORIGINAL ARTICLE

FREQUENCY OF FUNCTIONAL DISABILITY AND COGNITIVE IMPAIRMENTS IN SUB-ACUTE STROKE PATIENTS

ABSTRACT

BACKGROUND AND AIMS

Stroke is a very common neurological condition affects various aspects of health. The primary objective of this study was to find out the frequency of functional disability and cognitive impairments in Sub-acute Stroke patients.

MATERIAL AND METHODS

A cross-sectional survey was conducted on 112 Sub-acute Stroke patients in Karachi, Pakistan. Using Barthel Index (BI) and Mini-Mental State Examination (MMSE) test was used to find out the frequency of functional disability and cognitive impairments of Sub-acute Stroke patients.

RESULTS

The correlation of BI scores with MMSE scores for the Male gender was 0.576 whilst the correlation of BI scores with MMSE scores for the Female gender was 0.440. The severity of functional disability concerning age groups assessed P-value was 0.026 using Chi-Square Test. The severity of functional disability (BI severity) concerning gender, P-value was found 0.097 using the same test.

CONCLUSION

Functional Disability is directly linked with age. However, there was no linkage established between Cognitive Impairment and age as well as gender. On close inspection, there was a trend between Functional disability and gender but not statistically significant.

KEYWORDS

Functional, Disability, Cognitive, Sub-Acute, Stroke, Barthel Index, Neurological.

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INTRODUCTION

Stroke or Cardio Vascular Accident (CVA) is a common, serious, and disabling global health-related problem.¹ Common risk factors of Stroke include age, diabetes mellitus, smoking, increased systolic blood pressure, prolonged use of antihypertensive drugs, and history of prior heart disease.² Incidence of stroke is high among Pakistani population as compared to other developed countries with the world's highest rate of stroke recorded in Pakistan per capita. The risk factor of stroke include hypertension, diabetes mellitus, prolong contraceptive use, dysthymias (atrial fibrillation, atrial flutter) Rheumatic/valve heart disease, socioeconomic background and health status but hypertension was most common risk factor according to prevalence rate³.

From all neurological conditions, it is one of the most catastrophic conditions.³ Furthermore, 15 million people out of the total world population receives this Neurological condition, out of these 15 million, 5.5 million deaths occur annually, in the USA, the death ratio is about 140,000, in Canada, 15,409 people get died in the year of 2001, Europe average approximately 650,000 each year, by the year of 2025, it is estimated that elder world population (more than 65 years of age) will suffer more and the ratio will be around 9 million.³ In India, the predominance of intellectual weakness is accounted for as 20% in complete stroke survivors. Moreover, the assessments of the commonness of psychological disability post-stroke range from 12% to 60% and differ as indicated by setting (emergency clinic versus local area), time since stroke, and incorporation of pre-stroke dementia³⁻⁴.

All around, 90% of the stroke victims as estimated in "disability-adjusted life years" or DALYs are affecting by the changeable risk factors, including 74% because of adaptive factors such as smoking, poor nourishment and less amount of physical movement.⁴ Furthermore, various factors related to metabolism such as raised systolic blood pressure, increased BMI, raised fasting plasma glucose level, raised cholesterol level and low GFR; 72% and environmental components include air contamination and infiltration of lead which contributed 33%, are the 2nd and 3rd biggest supporters of DALYs.⁴

Many physical impairments are treating by clinicians to rehab the stroke patients like muscle tone, muscle weakness, proprioception, sensory and motor deficits, muscle imbalance, alternation in line of gravity (LOG), and base of support (BOS), decrease safety awareness, and poor balance.⁵⁻⁷ The major cause of dysfunction in adults is high between 50 to 60 years of age thereby increasing mortality ratio that may cause economic burden on the society.

Decreased muscular strength (muscular weakness) and coordination are common symptoms of stroke; it

can be in one or more than one extremities. This muscular weakness can occur in one part of the body like a hand, but mostly it occurs in more than one part on the same side of the body.⁸ Spasticity is another physical impairment in stroke patients it is characterized by the increased muscular tone, clonus (muscular contractions and relaxations in oscillatory fashion as the result of muscular stretching), and exaggerated stretch reflexes. It is probably caused by the removal of inhibitory influences exerted by the cortex on the postural centers of the vestibular nuclei in the reticular formation.⁸ Furthermore, Psychological impedance is linked to decreased activities of daily living and instrumental activities of daily living capacity, and patients may require long-term, ongoing repair. Patients with psychological impairment tend to be more organized, handicapped, have a higher death rate, and have a lower quality of life.

Despite of the number of impairments following stroke, cognition is characterized as an aspect of psychology that is responsible for processing information and comprehension in mind involving memory, judgment, thinking and observation that may have a significant role in emotional conduct. Moreover, functions of cognition are at an utmost requirement to perform activities of daily living and certain tasks, specifically for the purpose of rehabilitation such that cognition plays an important role in rehabilitation of clients having different diagnosis or conditions. However, daily and instrumental activities of life may get affected by the limitation of cognition, prompting to alter quality of life. Such deficit may leads to adverse consequences in performing tasks. Approximately more than 72% of stroke victims develop some minor cognitive impairment.⁹ It has been revealed that impairments include memory, problem-solving, speech, executive functions, and attention.¹⁰ Although, cognitive impairments are undetectable as clients have less familiarity and increase progression thus it is hard to perceive the cognitive deficiency in discipline of healthcare.

In 1965, Barthel Index (BI) came into existence, and after some time Granger and his co-workers modified it as a scoring tool that measures the victim's performance in ten different ADLs. These ADLs can be placed into different groups that are related to self-care (grooming, dressing, feeding, bathing, toilet use, and bowel and bladder care) and a group related to overall movement (stair climbing, transfer, and ambulation).¹¹⁻¹⁴ The total score is 100. 0 is considered the lowest score, indicating bed-bound state and total dependency, as the patient is progressing towards 100, indicating the independency.¹⁵⁻¹⁷

Post-Stroke Cognitive impairment is also very common and it is the predictor of early mortality and dependency. Approximately 10% of stroke victims who receive this neurological condition the very first time, also develop dementia. And 30% develop with recur-

rent stroke attacks. Although there is thus a need for short feasible tests of global cognition in stroke, the Mini-Mental State Examination (MMSE) is widely used.¹⁸ It is the tool that assesses cognition both in research study and clinical setup. The MMSE is divided into 2 parts, the first of which requires oral responses only and covers, orientation, memory, and attention. The second part tests subject's ability to name objects, follow verbal and written commands, write a sentence and copy a complex polygon. The maximum total score is 30.¹⁹ Although MMSE is frequently used for evaluating cognitive functions in clinical practice, it has some limitations. It is concluded that MMSE could be inadequate in evaluating mild forms of cognitive dysfunction and cognitive impairments due to right hemisphere dysfunction.²⁰

METHODOLOGY

Sample Size
112

Study Design
Cross-Sectional

Sampling Method
Non-Probability Purposive Sampling Technique
A cross-sectional descriptive survey had been conducted among patients in different private and public sector hospitals in Karachi, Pakistan by students of the Institute of Physical Medicine and Rehabilitation, Dow University of Health Sciences.

The sampling technique was non – probability purposive sampling technique. The sample size calculated was 249 by using WHO online sample size calculator OPEN EPI version 3, with the hypothesized frequency of 63% (cognitively impaired patients), confidence limit of 5%, and design effect of 1%.⁵

However, a study was performed at 112 sample sizes because of the limited and short period. And the period it took was around 2 months after the approval of the synopsis.

Inclusion criteria
Individuals with Sub-Acute Stroke patients, both male and female population, and the age limit were 25-65 years.

Exclusion criteria
Individuals with Neurological conditions other than Sub-Acute Stroke e.g TBI, SCI, Neuroma, Dementia.

Two questionnaires for this study, Barthel Index which was used to check Functional Disability, and MMSE (Mini-Mental State Examination) test which was used to check cognitive impairment, among Sub-Acute Stroke patients. The collected data were kept confidential. The research was conducted according to the principles of the declaration of Helsinki.

The data was entered and analyzed by SPSS version 21 software. Frequency and percentage were put according to gender, age groups, and severity of functional disability and cognitive impairment. Correlation analysis and Chi-Square tests were applied to generate results for this statistical analysis.

Ethical Consideration

The set of rules were followed to the standards of the affirmation of the college and has been permitted by an institute. However, written consent was obtained from each applicant before every time test was executed. All members had the right to withdraw from this study at any phase.

RESULTS

Correlation Analysis and Chi-Square test were applied during the statistical analysis to find out relations and frequencies, and tables that were generated by SPSS 21 software during statistical analysis. According to the interpretation of the tables the Mean age was 53.90 years with an S.D of 8.652 years. Mean scores for Barthel Index were 59.11 out of a total of 100 scores, with an S.D of 23.769. Mean scores of MMSE were 23.48 out of a total of 30 scores, with an S.D of 8.569. (Table no.1).

Table no.1 – Statistics for Age, BI_total, and MMSE total

	Age	BI_Total	Total_MMSE
N Valid	112	112	112
Missing	0	0	0
Mean	53.90	59.11	23.48
Std. Deviation	8.652	23.769	8.569

The mean age value was found in a research paper 80 years in female and 76 years in male subjects. However, this mean value of age is not matching with our study's mean age because this study is done in western society and their life expectancy is higher than Pakistan.²⁰

Table no. 2 - Correlation of BI scores with MMSE scores for Male gender

		BI_Total	Total_MMSE
Spearman's rho	BI_Total	Correlation Coefficient	.573**
		Sig. (2-tailed)	.0
		N	74
Spearman's rho	Total_MMSE	Correlation Coefficient	.573**
		Sig. (2-tailed)	.0
		N	74

** . Correlation is significant at the 0.01 level (2-tailed).

Table no. 3 - Correlation of BI scores with MMSE scores for Female gender

		BI_Total	Total_MMSE
Spearman's rho	BI_Total	Correlation Coefficient	1.000
		Sig. (2-tailed)	.006
		N	38
Total_MMSE	BI_Total	Correlation Coefficient	.440**
		Sig. (2-tailed)	.006
		N	38

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.1 - Crosstab for BI (Functional Disability) Severity with respect to Age groups

		BI_Severity				Total
		Severe (0-25)	Moderate (26-50)	Mild (51-75)	Low (76-100)	
Age Groups <= 50 (25-50 Years)	Count	1	13	16	5	35
	% within BI_Severity	9.1%	36.1%	45.7%	16.7%	31.2%
>50 (51-65 Years)	Count	10	23	19	25	77
	% within BI_Severity	90.9%	63.9%	54.3%	83.3%	68.8%
Total	Count	11	36	35	30	112
	% within BI_Severity	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5.1 - Crosstab for MMSE (Cognitive Impairment) Severity with respect to Age groups

		MMSE_Severity			Total
		Severe Cog Imp (0-17)	Mild Cog Imp (18-23)	No Cogn Imp (24-30)	
Age Groups <= 50 (25-50 Years)	Count	7	4	24	35
	% within MMSE_Severity	26.90%	33.30%	32.40%	31.20%
>50 (51-65 Years)	Count	19	8	50	77
	% within MMSE_Severity	73.10%	66.70%	67.60%	68.80%
Total	Count	26	12	74	112
	% within MMSE_Severity	100.00%	100.00%	100.00%	100.00%

Table 5.2 Chi-Square Tests Statistics for MMSE (Cognitive Impairment) Severity with respect to Age groups

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.299 ^a	2	.861
Likelihood Ratio	.305	2	.859
Linear-by-Linear Association	.232	1	.630
N of Valid Cases	112		

Table 6.1 - Crosstab for BI (Functional Disability) Severity concerning Gender

		BI_Severity				Total
		Severe (0-25)	Moderate (26-50)	Mild (51-75)	Low (76-100)	
Gender Male	Count	8	18	25	23	74
	% within BI_Severity	72.70%	50.00%	71.40%	76.70%	66.10%
Gender Female	Count	3	18	10	7	38
	% within BI_Severity	27.30%	50.00%	28.60%	23.30%	33.90%
Total	Count	11	36	35	30	112

Table 6.2 Chi-Square Tests Statistics for BI (Functional Disability) Severity concerning Gender

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.316 ^a	3	.097
Likelihood Ratio	6.213	3	.102
Linear-by-Linear Association	2.414	1	.120
N of Valid Cases	112		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.73.

Table 7.1 - Crosstab for MMSE (Cognitive Impairment) Severity concerning Gender

		MMSE_Severity			Total
		Severe Cognitive Impairment (0-17)	Mild Cognitive Impairment (18-23)	No Cognitive Impairment (24-30)	
Gender Male	Count	18	9	47	74
	% within MMSE_Severity	69.2%	75.0%	63.5%	66.1%
Gender Female	Count	8	3	27	38
	% within MMSE_Severity	30.8%	25.0%	36.5%	33.9%
Total	Count	26	12	74	112
	% within MMSE_Severity	100.0%	100.0%	100.0%	100.0%

Table 7.2 Chi-Square Tests Statistics for MMSE (Cognitive Impairment) Severity with respect to Gender

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.758 ^a	2	.684
Likelihood Ratio	.780	2	.677
Linear-by-Linear Association	.410	1	.522
N of Valid Cases	112		

a. 1 cell (16.7%) has an expected count of less than 5. The minimum expected count is 4.07.

DISCUSSIONS

The primary aim of this study was to check the frequencies of Functional disability and Cognitive impairment in Sub-Acute Stroke victims. During the statistical analysis we focused on six parameters that are given below:

Here, above we discussed age groups, we considered two age groups. One was less than equal to 50 years (25-50 years) and the second was greater than 50 years (50-65 years). About the cutoff values for both the questionnaires, the details are given below:

As discussed above that during statistical analysis focus was on six main parameters, each one is discussed below.

When we correlated the BI scores with MMSE scores separately for the male gender there was a moderate positive correlation between BI scores and MMSE scores which means when BI score increases MMSE score also increases. When we correlated the BI scores with MMSE scores separately for the female gender there was a moderate positive correlation between BI scores and MMSE scores which means when BI score increases MMSE score also increases.

For Severity of functional disability (BI severity) with respect to age groups, Chi-Square test was applied and results showed that Functional Disability is directly linked with Age, as age increases Functional Disability also increases. On the other hand, for Severity of Cognitive impairment (MMSE severity) concerning age groups, the same test was applied and results showed that Cognitive impairment is not linked with Age.

The study concluded that there has been an increased risk of Stroke with age, leading to an increased level of disability post-stroke.²¹ This statement has an important impact on public health and policymaker to ensure that a sufficient amount of resources would be available to handle caring needs among the post-stroke older population.²¹

For Severity of Functional disability (BI severity) with respect to gender, the Chi-Square test was applied and results showed that Functional disability is somehow linked with gender, as P-value was very close to 0.05. On the other hand, for Severity of Cognitive (MMSE severity) for gender, the same test was used and results showed that Cognitive impairment is not linked with gender. In this study there was a moderate level of relationship was found between genders and BI & MMSE. Kelly-Hayes and co-researchers revealed that both genders similar levels of neurological deficits.²²⁻²⁵

Despite of the fact, the assessment strategies used by primary care professionals may be a top-down or bottom-up approaches according to the level of their competencies²². Consecutively, the standardized

and non-standardized assessment tools are utilized for the assessment of specific cognitive and functional disabilities. On the other hand, cognitive capacities, memory and problem-solving strategies may also be determined through non-formal assessments²⁰⁻²⁵. On the contrary, standardized assessments utilized to quantify information with other experts on the health-care team have provided reliable and valid results as per the evidence as these assessments established for evidence-based practice in comparison to non-standardized assessments²¹. Thus, adequate knowledge of therapists regarding the tool or scale should be taken into consideration for better administration of outcome measures.

CONCLUSION

Functional Disability is directly linked with age. However, there was no linkage established between cognitive deficits and age as well as gender. On close inspection, there was a trend between functional disability and gender but not statistically significant. Further studies based on survey or experimental designs are needed in future to analyze the usage of cognitive and functional disability tools in the assessment of stroke-related deficits. Moreover, adequate knowledge of healthcare providers is suggestive for better administration of the functional assessments.

REFERENCES

- [1] Langhorne P, Bernhardt J, Kwakkel G. Stroke rehabilitation. *The Lancet*. 2011;377(9778):1693-702.
- [2] Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, De Ferranti SD, Floyd J, Fornage M, Gillespie C, Isasi CR. Heart disease and stroke statistics—2017 update: a report from the American Heart Association. *circulation*. 2017 Mar 7;135(10):e146-603.
- [3] Mukherjee D, Patil CG. Epidemiology and the global burden of stroke. *World neurosurgery*. 2011;76(6):S85-S90.
- [4] Feigin VL, Roth GA, Naghavi M, Parmar P, Krishnamurthi R, Chugh S, et al. Global burden of stroke and risk factors in 188 countries, during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet Neurology*. 2016;15(9):913-24.
- [5] Paker N, Buğdaycı D, Tekdöş D, Kaya B, Dere Ç. Impact of cognitive impairment on functional outcome in stroke. *Stroke Research and Treatment*. 2010;2010.
- [6] Champod AS, Gubitza GJ, Phillips SJ, Christian C, Reidy Y, Radu LM, Darvesh S, Reid JM, Kintzel F, Eskes GA. Clock Drawing Test in acute stroke and its relationship with long-term functional and cognitive outcomes. *The Clinical Neuropsychologist*. 2019 Jul 4;33(5):817-30.7.
- [7] Balasubramanian S. MOTOR IMPAIRMENT FOLLOWING STROKE. Renjen PN, Gauba C, Chaudhari D. Cognitive impairment after stroke.

- Cureus. 2015 Sep;7(9).
- [8] Robert Teasell MD, Macaluso S. Post-Stroke Cognitive Disorders.
- [9] 14.10 Sun JH, Tan L, Yu JT. Post-stroke cognitive impairment: epidemiology, mechanisms and management. *Annals of translational medicine*. 2014 Aug;2(8).
- [10] Sun JH, Tan L, Yu JT. Post-stroke cognitive impairment: epidemiology, mechanisms and management. *Annals of translational medicine*. 2014 Aug;2(8).
- [11] Raju PS. *Handbook of neurological physical therapy*. JP Medical Ltd; 2012.
- [12] Koch G, Bonni S, Casula EP, Iosa M, Paolucci S, Pellicciari MC, Cinnera AM, Ponzio V, Maiella M, Picazio S, Sallustio F. Effect of cerebellar stimulation on gait and balance recovery in patients with hemiparetic stroke: a randomized clinical trial. *JAMA neurology*. 2019 Feb 1;76(2):170-8.
- [13] Lo AC, Guarino PD, Richards LG, Haselkorn JK, Wittenberg GF, Federman DG, Ringer RJ, Wagner TH, Krebs HI, Volpe BT, Bever Jr CT. Robot-assisted therapy for long-term upper-limb impairment after stroke. *New England Journal of Medicine*. 2010 May 13;362(19):1772-83.
- [14] Dennis M, Mead G, Forbes J, Graham C, Hackett M, Hankey GJ, House A, Lewis S, Lundström E, Sandercock P, Innes K. Effects of fluoxetine on functional outcomes after acute stroke (FOCUS): a pragmatic, double-blind, randomised, controlled trial. *The Lancet*. 2019 Jan 19;393(10168):265-74.
- [15] Adeoye O, Nyström KV, Yavagal DR, Luciano J, Nogueira RG, Zorowitz RD, Khalessi AA, Bushnell C, Barsan WG, Panagos P, Alberts MJ. Recommendations for the establishment of stroke systems of care: a 2019 update: a policy statement from the American Stroke Association. *Stroke*. 2019 Jul;50(7):e187-210.
- [16] Pendlebury ST, Cuthbertson FC, Welch SJ, Mehta Z, Rothwell PM. Underestimation of cognitive impairment by Mini-Mental State Examination versus the Montreal Cognitive Assessment in patients with transient ischemic attack and stroke: a population-based study. *Stroke*. 2010 Jun 1;41(6):1290-3.
- [17] Spatola M, Petit-Pedrol M, Simabukuro MM, Armangue T, Castro FJ, Artigues MI, Benique MR, Benson L, Gorman M, Felipe A, Oblitas RL. Investigations in GABAA receptor antibody-associated encephalitis. *Neurology*. 2017 Mar 14;88(11):1012-20.
- [18] Chan WL, Pin TW. Reliability, validity and minimal detectable change of 2-minute walk test, 6-minute walk test and 10-meter walk test in frail older adults with dementia. *Experimental gerontology*. 2019 Jan 1;115:9-18.
- [19] Bernheisel CR, Schlaudecker JD, Leopold K. Subacute management of ischemic stroke. *American family physician*. 2011 Dec 15;84(12).
- [20] Aad G, Abajyan T, Abbott B, Abdallah J, Khalek SA, Abdelalim AA, Aben R, Abi B, Abolins M, AbouZeid OS, Abramowicz H. Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC. *Physics Letters B*. 2012 Sep 17;716(1):1-29.
- [21] Raposa EB, Dietz N, Rhodes JE. Trends in volunteer mentoring in the United States: Analysis of a decade of census survey data. *American Journal of Community Psychology*. 2017 Mar;59(1-2):3-14.
- [22] Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, Deruyter F, Eng JJ, Fisher B, Harvey RL, Lang CE. Guidelines for adult stroke rehabilitation and recovery: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2016 Jun;47(6):e98-169.
- [23] Patel, M.D., Coshall, C., Rudd, A.G. and Wolfe, C.D., 2002. Cognitive impairment after stroke: clinical determinants and its associations with long-term stroke outcomes. *Journal of the American Geriatrics Society*, 50(4), pp.700-706.
- [24] Levine DA, Galecki AT, Langa KM, Unverzagt FW, Kabeto MU, Giordani B, Wadley VG. Trajectory of cognitive decline after incident stroke. *Jama*. 2015 Jul 7;314(1):41-51.
- [25] Rosenich E, Hordacre B, Paquet C, Koblar SA, Hillier SL. Cognitive reserve as an emerging concept in stroke recovery. *Neurorehabilitation and neural repair*. 2020 Mar;34(3):187-99.



LITERATURE REVIEW**ROLE OF PHYSICAL THERAPY TREATMENT IN ANTENATAL CARE****ABSTRACT****BACKGROUND**

Different types of physical therapy treatment interventions like postural guidance, nutritional guidance, and exercises performed by antenatal patients could have advantageous effects on pregnant women and fetus.

OBJECTIVE

To evaluate the role of different physical therapy treatments in the antenatal patient.

SEARCH STRATEGY

A literature search is done through PubMed, Google Scholar and the Institute for Scientific data (ISI) net of Knowledge on the consequences of physical exertion throughout pregnancy on maternal and baby outcomes was performed. The knowledge about physical exercises during pregnancy is not clear. This review article is designed to explore the interventions of physical exercises during pregnancy in healthy normal women.

SUMMARY

Physical therapy is very essential for antenatal women to maintain their health during pregnancy. It has been documented that physical exercises are safe for the fetus and in long term by improving the quality of life of pregnant women. Healthy pregnant women should perform and continue regular physical exercises on daily basis by following the recommended guidelines. All pregnant women who are not facing any complications in their pregnancy should be encouraged to contribute to aerobic and strengthening exercises. Antenatal women undergo many body changes during their pregnancy for example weight gain which alters balance and coordination. The goal of physical exercises during pregnancy to maintain good health and fitness. Physical exercises during pregnancy should reduce the risk of back pain, constipation, gestational diabetes, preeclampsia and cesarean delivery. However, physical exercises promote healthy weight gain, improve general fitness, and strengthen heart and blood vessels, and helps to reduce the weight of the baby after pregnancy.

KEYWORDS

Antenatal Care, Physical Activity, Exercise, Physical therapy, Maternal Health, Pregnant Women, Pregnancy.

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INTRODUCTION

The aim of antenatal exercises to improve the physical and psychological health and prevents pregnancy induced pathologies in pregnant women. Regular physical exercises such as low impact aerobic and stretching exercises offers fitness to the each individual which is the dream of every individual. The engagement of an individual in everyday plan physical activity is obligatory to maintain the health and fitness.¹ Previous types of research proved that Improvement of memory, protection from chronic illnesses, maintenance of weight, reduction of blood pressure, maintenance of glucose level, Improve sleep, improvement of cardiac fitness, increase musculoskeletal strength, reduction of anxiety and depression can be achieved by physical activity. Despite any age limit every individual, especially pregnant women, needs to perform exercises during pregnancy because it is very beneficial in maintaining her health and also acts as a preventive measure for any discomfort caused by pregnancy's normal physiological changes.² Awareness regarding the promotion of antenatal care of pregnant women and fetuses plays a vital role in the health care system nowadays because to obtain safe maternity and improved neonatal outcomes it is important to perform accurate and appropriate exercises during pregnancy. According to recent research done by WHO showed that: healthy pregnant women should visit at least four times during pregnancy for antenatal classes in a specified period according to the guidance given by the physical therapist.³ As pregnancy begins first antenatal class should be done as early as possible that helps in the prevention of various problems associated with pregnancy like spina bifida, iron deficiency, body pain due to incorrect posture, etc. The last antenatal class should be done at 37 weeks of gestational.

age near the expected date of delivery that helps the women to cope up with the labor period effectively, multiple baby births, etc.⁴ One of research mention that approximately 25 to 30 percent of antenatal women need more than four visits during pregnancy due to another complication associated with physiological changes during pregnancy.⁵ Some of the problems that can be caused by being overweight during pregnancy, poor posture, shifting in the Centre of gravity are as follows: backache, inflammation of the sciatic nerve, overuse strain injury, pain in the sacroiliac joint, weakness of pelvic floor muscles, cervical pain, breathing difficulties, indigestion, legs cramps, fatigue, headache, swelling, separation of diastasis recti muscles (six-packs) and urinary incontinence. These complaints may or may not disappear after the delivery of the baby.⁶ For the reduction of pregnancy-related discomforts experienced by pregnant women and improvement of mother and baby antenatal care include: exercise, postural guidance is very important during pregnancy because pregnancy plays a vital role in the development and manage-

ment of own health and effective parenting behavior.⁷ The reduction in pain threshold, duration of labor, injuries of baby by birth, maintenance of blood pressure, and blood glucose level during pregnancy can be achieved by antenatal exercises. Insufficient care of antenatal women can cause adverse effects to mother and fetus as well. Because approximately 25% of women's death occurs during pregnancy concerning variation in the prevalence rate of disease, miscarriages, the ferocity of different countries, More than half of antenatal deaths occur due to hypertension and hemorrhage due to inappropriate care of women during pregnancy.⁸

Who Guidelines for Antenatal Women

According to WHO all antenatal and postnatal women should follow the following guidelines:

- Pregnant women should do regular physical exercises such as aerobic of moderate intensity for at least 150 min on daily basis.
- Pre-pregnant women who were physically active such as performing aerobic and yoga exercises them should continue their physical activities during pregnancy as well.
- Pregnant women who were not able to perform aerobic exercises should start physical activities gradually and then increases the frequency and intensity and duration of exercises.
- The urinary incontinence is reduced by performing pelvic floor muscle exercises on daily basis.
- A sedentary lifestyle should be limited in pregnant women by replacing small intensity of physical activities which is beneficial for them.⁹

Pregnancy safety consideration

There are many safety considerations which is necessary for the pregnant women during their pregnancy.

- Pregnant women should avoid physical exercises during humidity and excessive heat.
- She should drink plenty of water during and after physical exercises.
- Pregnant women avoid participating in such physical exercises in which are associated with direct physical contact and might be responsible for falling such as at high altitudes.
- After the first trimester, pregnant women avoid exercises in a supine position.
- Pregnant women who performing athletic competitions more than the recommended guidelines should seek out proper supervision from specialist healthcare providers for any kind of complication.⁹

METHODOLOGY

The present review article extracted out from different research websites including Pub Med, Google Scholar, and Science direct the Institute for Scientific direct by searching the medical terms including; knowledge and physical exercises during pregnancy, physiotherapy, antenatal exercises, yoga, and posture exercise. The literature review was completed by searching 50 articles from last 25 years. In the current review; we

restrict the search to permit for the inclusion criteria to assessed the having controlled trials of healthy pregnant women who underwent physical exercise program in which fetal and maternal outcomes included. For this, the following articles were screened and then analyzed by consistently reviewing their abstracts. Afterward, fifty full texts were accessed and their reference lists were additionally reviewed.

Prevalence of Antenatal Physical Therapy

The prevalence and characteristics of antenatal exercises are studied by different researchers in many countries. One of the researchers reported in his research about the level of physical activity among pregnant women in the U.S is that only 15.8% of females are involved in antenatal exercises at the suggested level.¹⁰ Another research from Ireland reported that only 21.5% of antenatal females have no complications related to pregnancy and they are doing exercises at the recommended level.¹¹ There is a decrease in frequency and duration of exercise in non-pregnant women instead of antenatal women in Danish. There is a reduction of physical activity during the 3rd trimester of pregnancy who usually do exercises a regular basis during pregnancy, however, 6 to 29% of the increase in sedentary activity of the antenatal patient.¹² Figure-1 shown the prevalence of physical activity in Pakistan.

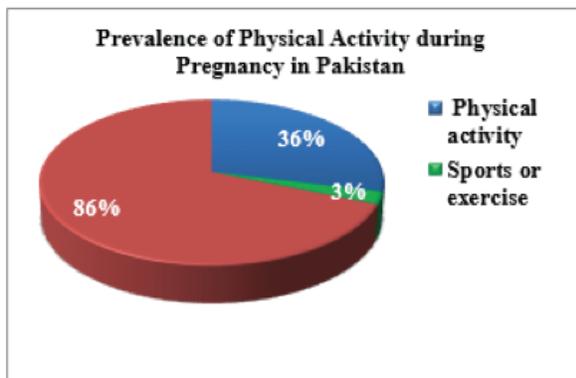


Figure-1: Prevalence of physical activity during pregnancy in Pakistan¹³

Physical Therapy Interventions

Previous studies reported that the following are the different essentials interventions which are required to treat and manage antenatal women in physical therapy: 14-20

- Breathing Exercises
- Aerobic Exercises
- Stretching Exercises
- Strengthening Exercises.
- Yoga
- Postural Guidance
- Nutritional Guidance

Breathing Exercises

Breathing Exercises are useful for antenatal women during labor for pain management. Following are some breathing exercises that can be performed

during pregnancy:

- Abdominal breathing
- Lower costal breathing
- Apical breathing

Abdominal breathing

Abdominal exercises are performed by breathing in through the nose and sense to expand the abdomen and then breathe out through the mouth. This exercise is appropriate in minor labor pain.

Lower costal breathing

Lower costal breathing can be performed by breathing in through your nose and sense to expand your chest then breathe out through your mouth slowly, this exercise is appropriate for moderate pain during labor.

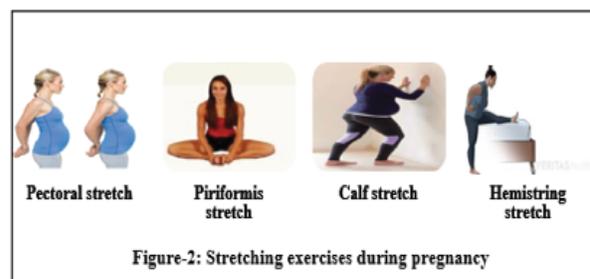
Apical breathing

Apical breathing is performed by placing cross hands below the level of clavicles and breathe in through your nose and breathe out through the mouth slowly and sense to move your upper lobes of lungs up and down slowly. This exercise can be useful in severe pain of labor.

It is suggested to antenatal women that they should try to stay calm and relax during labor contractions and perform breathing exercises to maintain their breathing and comfort position.²¹

Aerobic Exercises

For the promotion of physical fitness and strengthening of muscles, many exercises can be performed by an antenatal patient. Aerobic exercises such as walking, hiking, Jogging, Biking, Swimming are some of the effective ways which elevate the heart rate and provides oxygen and blood to the muscles.²² walking is the easiest way to perform aerobics so the duration of walking can be 20- 30 minutes three to four times a week for pregnant.²³



Stretching Exercises

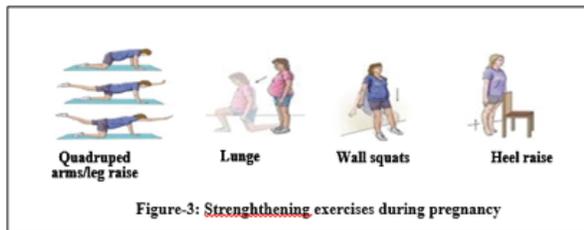
Stretching exercises can also be an effective way of being physically active during pregnancy such as pectoral stretch which can prevent round shoulders during pregnancy.²⁴ piriformis stretch which can stabilize the pelvis and make it easy to perform activities of daily living.²⁵ hamstring stretch which can reduce the hamstring muscles shortening and that is usually the main cause of backache and misalignment of the pelvis.²⁶ calf stretch can produce more

stability during walking by producing more force during the push-off phase during pregnancy.²⁷

Strengthening Exercises

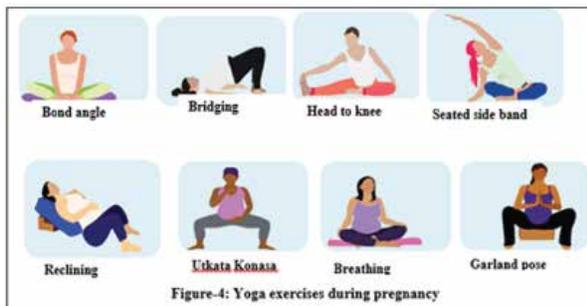
Strengthening exercises are also very helpful for the physical fitness of antenatal patient some of the strengthening exercises which can be very beneficial are as shown in figure-3.

Bridging, this exercise is more specific for postural muscles and mainly Gluteus maximus strengthening. According to researches, lumbar spine proprioception is also improved through bridging.²⁸ Squats is a stretching exercise that increase stabilization of lower limbs focuses on gluteus maximus.



Yoga

Yoga derived from SANSKRIT ROOT, meaning is to unite, to join and to yoke. Combination of deep breathing, stretching exercises, meditation and posture is called Yoga. Its purpose is to unite your soul, mind and body. There are many benefits of yoga which is discussed in previous researches some of the benefits of yoga are: Reduction of stress, depression, longterm pains associated with joints, muscles and bones and also helps to maintain blood pressure and sugar levels.²⁹ Moodswings, discomfort associated with musculoskeletal problems, increase in weight, pain, swelling all problems can be efficiently manage by yoga during pregnancy.³⁰ Figure-4 illustrated the different poses and exercises of yoga of antenatal patients which can easily perform without and side effects.



Postural Guidance

The word Posture derived from the Latin word PONERE meaning is: to put or place. Posture is defined as the attitude or carriage of the body.³¹ Due to physiological changes postural changes during pregnancy is very common which inturns cause backache in 50% to 70% of antenatal patients.³²⁻³⁴ The development of back pain has been related to spinal changes, especially an increase in lumbar curvature, which alters the distribution of loads, causing increased

tensions in lumbar structures.^{35,36} Figure-5 represent both the bad posture and good posture during pregnancy:

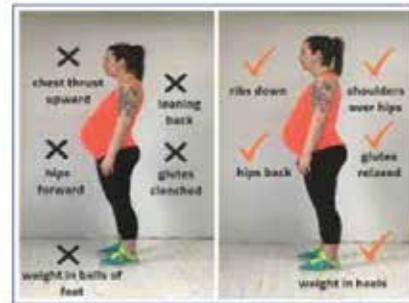


Figure-5: Posture during pregnancy <https://www.pinterest.com/pin/576671927265754437>

Nutritional Guidance

According to Canada's Food Guide to Healthy Eating, Pregnant women should choose healthy foods from basic food groups (carbohydrates, proteins, fats and oil, vitamins and minerals) with a focus on proper hydration to prevent dehydration which is very dangerous for women and fetus. Exercising women during pregnancy requires more caloric requirements to overcome the need for additional energy and also daunt the starving to lose weight.^{38,39} Inhibit the use of caffeine in the form of smoking, alcohol intake. More information regarding nutrition guidelines during pregnancy is discussed in Canadian research published in 1999.⁴⁰

DISCUSSION

According to research, a sedentary lifestyle is more common in pregnant women as compared to physical activity level at pre-pregnancy state. Another study shows that women who are physically active during their pregnancy may have fewer chances of occurrence of hypertension, diabetes, body aches, depression, fatigue, preterm labor.⁴¹ In addition, there is a risk of body pain associated with pregnancy especially in women who can experience low back pain which in turn causes a reduction in the level of physical activity and reduce the efficiency of performance in every type of work. A large amount of absenteeism from office work of women job is also due to back and throughout body pain during pregnancy, For management of pain during pregnancy pharmaceutical therapy may be harmful to a baby that is why conservative treatment is preferred which is considered to have minimal or no side effects so physical therapy play a vital role in prevention and management of pain during pregnancy because through this female can be physically active and can minimize all expected body pain during pregnancy.⁴²

It is a common belief and multiple times proved that: Being physically active during pregnancy is very beneficial for antenatal women and babies as well. For lifestyle modifications, pregnancy is the best time. There is no need to perform aggressive exercises during pregnancy only moderate level exercises are recommended

during pregnancy.⁴³ According to different studies it is proved that exercise and different interventions use in physical therapy treatment can reduce pain, increase the efficiency of performance and activities of daily living. According to public health policies, there is a reduction in the overall number of LSCS (lower segment cesarean sections) rate due to active participation in an antenatal physical therapy program which includes relaxation exercise.⁴⁴ In addition one of the research reported that due to participation in antenatal physical therapy programs stress and fear of labor is also reduced in women.⁴⁵ According to research conducted in Brazil, the majority of the females favored vaginal mode of delivery due to the fear of pain at labor during lower segment cesarean section procedure.⁴⁶ Another research of Sweden reported that women's fear of labor and their favor towards LSCS (lower segment cesarean section) increased more in the first trimester of pregnancy which shows the sign of anxiety during pregnancy.⁴⁷ Another research reported that health policy regarding prenatal care aimed at improving the health of women and promote quality of life-based on evidence-based practices with special consideration that: do not use gratuitous interventions and preserve women choice as well. The presence of caregivers of women's own choice during childbirth will be an effective measure in motivating women during labor. The use of conservative techniques for the management of pain during labor should be encouraged as well comfortable position preference by women should be allowed.⁴⁸ General recommendations regarding frequency, period, the intensity of exercises during pregnancy have not existed yet, but the benefits of physical exercises to baby and antenatal women although increased, awareness regarding the benefits of exercises to antenatal women and baby is reported in many studies. Doctors are considered as the vital person in educating antenatal women about the benefits of exercise and behavior of women towards exercise as the doctor has the vital role in the education of antenatal women about the benefits of exercise and behavior of women towards exercise.^{49,50} In our literature search we mention the different physical therapy exercises for antenatal women for the benefits of baby and pregnant women and can provide a better outcome to the female in response to physical activity.

CONCLUSION

Physical therapy during pregnancy is very important for the prevention and treatment of problems associated with pregnancy as mention in the above systematic review. It provides many benefits for pregnant women and babies. Women who attend antenatal classes during pregnancy on regular basis and follow instructions include: all exercises according to different trimesters protocols and guidelines regarding posture and nutrition are more physically active and painless during pregnancy as compare to women not taking classes during pregnancy.

REFERENCES

- [1] Elden H, Ladfors L, Olsen MF, Ostgaard HC, Hagberg H. Effects of acupuncture and stabilizing exercises as adjunct to standard treatment in pregnant women with pelvic girdle pain: randomised single blind controlled trial. *Bmj*. 2005 Mar 31;330(7494):761
- [2] Grannis CJ. The ideal physical therapist as perceived by the elderly patient. *Physical therapy*. 1981 Apr 1;61(4):479-86.
- [3] Sujindra E, Bupathy A, Suganya A, Praveena R. Knowledge, attitude, and practice of exercise during pregnancy among antenatal mothers. *Int J of Educ and Phys Res* 2015;1:234-37.
- [4] Madhuri GB. Textbook of Physiotherapy for obstetric and gynecological conditions. Jaypee Brothers Medical Publishers LTD; 2007.30-49.
- [5] Stuge B, Lærum E, Kirkesola G, Vøllestad N. The efficacy of a treatment program focusing on specific stabilizing exercises for pelvic girdle pain after pregnancy: a randomized controlled trial. *Spine*. 2004 Feb 15;29(4):351-9.
- [6] Harvey MA. Pelvic floor exercises during and after pregnancy: a systematic review of their role in preventing pelvic floor dysfunction. *Journal of Obstetrics and Gynaecology Canada*. 2003 Jun 1;25(6):487-98.
- [7] Jayasudha A. Effect of antenatal exercises on labour outcome among primigravid mothers. *Nurs J India*. 2013 Jan-Feb;104(1):10-3.
- [8] Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, Carty C, Chaput JP, Chastin S, Chou R, Dempsey PC. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *British Journal of Sports Medicine*. 2020 Dec 1;54(24):1451-62. Available from: <https://bjsm.bmj.com/content/54/24/1451> (accessed 2.12.2020)
- [9] Evenson KR, Savitz DA, Huston SL. Leisure-time physical activity among pregnant women in the US. *Paediatr Perinat Epidemiol* 2004; 18:400-407.
- [10] Walsh JM, McGowan C, Byrne J, McAuliffe FM. Prevalence of physical activity among healthy pregnant women in Ireland. *Int J Gynaecol Obstet* 2011; 114:154-155.
- [11] Hegaard HK, Damm P, Hedegaard M, et al. Sports and leisure time physical activity during pregnancy in nulliparous women. *Matern Child Health J* 2011; 15:806-813.
- [12] <https://www.medicalnewspk.com/exercise-during-pregnancy-a-social-dilemma-in-pakistan/>
- [13] Yuksel, H., Cayir, Y., Kosan, Z., & Tastan, K. (2017). Effectiveness of breathing exercises during the second stage of labor on labor pain and duration: a randomized controlled trial. *Journal of integrative medicine*, 15(6), 456-461.
- [14] Kulpa PJ, White BM, Visscher R. Aerobic exercise in pregnancy. *American journal of obstetrics and gynecology*. 1987 Jun 1;156(6):1395-403.
- [15] Ward-Ritacco, C., Poudevigne, M. S., & O'Con-

- nor, P. J. (2016). Muscle strengthening exercises during pregnancy are associated with increased energy and reduced fatigue. *Journal of Psychosomatic Obstetrics & Gynecology*, 37(2), 68-72.
- [16] Abbas MA, El Badrey SM, ElDeeb AM, Sayed AM. Effect of aerobic exercises on the thyroid hormones in treated hypothyroid pregnant women. *Journal of Advanced Pharmacy Education & Research | Oct-Dec. 2019;9(4):49-53.*
- [17] Babbar, S., Parks-Savage, A. C., & Chauhan, S. P. (2012). Yoga during pregnancy: a review. *American journal of perinatology*, 29(06), 459-464.
- [18] Bullock, J. E., Jull, G. A., & Bullock, M. I. (1987). The relationship of low back pain to postural changes during pregnancy. *Australian Journal of Physiotherapy*, 33(1), 10-17.
- [19] Lucas, C., Charlton, K. E., & Yeatman, H. (2014). Nutrition advice during pregnancy: do women receive it and can health professionals provide it?. *Maternal and child health journal*, 18(10), 2465-2478.
- [20] Kluge J, Hall D, Louw Q, Theron G, Grové D. Specific exercises to treat pregnancy-related low back pain in a South African population. *International Journal of Gynecology & Obstetrics*. 2011 Jun 1;113(3):187-91.
- [21] Sarfraz M, Islami D, Hameed U, Hasan Danish S, Ahmad F. Role of Physical Therapy in antenatal care as perceived by the clients—a cross sectional survey on pregnant females attending antenatal OPD. *Pakistan Journal of Medicine and Dentistry*. 2013;1(01):34-46.
- [22] Hinman SK, Smith KB, Quillen DM, Smith MS. Exercise in pregnancy: a clinical review. *Sports health*. 2015 Nov;7(6):527-31.
- [23] Kim MK, Lee JC, Yoo KT. The effects of shoulder stabilization exercises and pectoralis minor stretching on balance and maximal shoulder muscle strength of healthy young adults with round shoulder posture. *Journal of physical therapy science*. 2018;30(3):373-80.
- [24] Snijders CJ, Hermans PF, Kleinrensink GJ. Functional aspects of cross-legged sitting with special attention to piriformis muscles and sacroiliac joints. *Clinical biomechanics*. 2006 Feb 1;21(2):116-21.
- [25] Freburger JK, Holmes GM, Agans RP, Jackman AM, Darter JD, Wallace AS, Castel LD, Kalsbeek WD, Carey TS. The rising prevalence of chronic low back pain. *Archives of internal medicine*. 2009 Feb 9;169(3):251-8.
- [26] Hoang PD, Herbert RD, Todd G, Gorman RB, Gandevia SC. Passive mechanical properties of human gastrocnemius muscle-tendon units, muscle fascicles and tendons in vivo. *Journal of Experimental Biology*. 2007 Dec 1;210(23):4159-68.
- [27] Kong YS, Jang GU, Park S. The effects of prone bridge exercise on the Oswestry disability index and proprioception of patients with chronic low back pain. *Journal of physical therapy science*. 2015;27(9):2749-52.
- [28] Field T. Yoga clinical research review. *Complement Ther Clin Pract* 2011;17:1-8
- [29] Melzer K, Schutz Y, Soehnchen N, et al. Effects of recommended levels of physical activity on pregnancy outcomes. *American Journal of Obstetrics and Gynecology*. 2010;202(3):266.e1-266.e6.
- [30] Franklin ME, Conner-Kerr T. An analysis of posture and back pain in the first and third trimesters of pregnancy. *Journal of Orthopaedic & Sports Physical Therapy*. 1998 Sep;28(3):133-8.
- [31] Bastiaanssen JM, de Bie RA, Bastiaenen CH, Essed GG, van den Brandt PA. A historical perspective on pregnancy-related low back and/or pelvic girdle pain. *Eur J Obstet Gynecol Reprod Biol*. 2005; 1; 120(1):3-14.
- [32] Wu WH, Meijer OG, Uegaki K, Mens JM, van Dieen JH, Wuisman PI, et al. Pregnancy-related pelvic girdle pain (PPP), I: Terminology, clinical presentation, and prevalence. *Eur Spine J*. 2004; 13(7):575-89.
- [33] Kovacs FM, Garcia E, Royuela A, Gonzalez L, Abaira V. The Spanish Back Pain Research Network. Prevalence and factors associated with low back pain and pelvic girdle pain during pregnancy. A multicenter study conducted in the Spanish national health service. *Spine (Phila Pa 1976)*. 2012; 37(17), 1516-33.
- [34] Ostgaard HC, Andersson GB, Schultz AB, Miller JA. Influence of some biomechanical factors on low-back pain in pregnancy. *Spine (Phila Pa 1976)*. 1993; 18(1):61-5.
- [35] Ostgaard HC, Andersson GB, Schultz AB, Miller JA. Influence of some biomechanical factors on low-back pain in pregnancy. *Spine (Phila Pa 1976)*. 1993; 18(1):61-5.
- [36] To WW, Wong MW. Factors associated with back pain symptoms in pregnancy and the persistence of pain 2 years after pregnancy. *Acta Obstet Gynecol Scand*. 2003; 82(12):1086-91.
- [37] Evenson KR, Mottola MF, Owe KM, Rousham EK, Brown WJ. Summary of international guidelines for physical activity following pregnancy. *Obstetrical & gynecological survey*. 2014 Jul;69(7):407.
- [38] Wolfe LA, Davies GA. Canadian guidelines for exercise in pregnancy. *Clinical obstetrics and gynecology*. 2003 Jun 1;46(2):488-95.
- [39] Fell DB, Joseph KS, Armson BA, Dodds L. The impact of pregnancy on physical activity level. *Maternal and child health journal*. 2009 Sep 1;13(5):597.
- [40] Liu JH, Mayer-Davis EJ, Pate RR, Gallagher AE, Bacon JL. Physical activity during pregnancy is associated with reduced fasting insulin—the Pilot Pregnancy and Active Living Study. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2010 Oct 1;23(10):1249-52.
- [41] Wolfe LA, Davies GA. Canadian guidelines for exercise in pregnancy. *Clinical obstetrics and gynecology*. 2003 Jun 1;46(2):488-95.

- [42] Guskowska M. The effect of exercise and childbirth classes on fear of childbirth and locus of labor pain control. *Anxiety Stress Coping*. 2014;27(2):176–89. doi: 10.1080/10615806.2013.830107.
- [43] Victora CG, Aquino EM, do Carmo Leal M, Monteiro CA, Barros FC, Szwarcwald CL. Maternal and child health in Brazil: progress and challenges. *Lancet*. 2011;377((9780)):1863–76. doi: 10.1016/S0140-6736(11)60138-4.
- [44] Dias MA, Domingues RM, Pereira AP, Fonseca SC, Gama SG, Theme Filha MM, et al. The decision of women for cesarean birth: a case study in two units of the supplementary health care system of the State of Rio de Janeiro. *Cienc Saude Coletiva*. 2008;13(5):1521–34. doi: 10.1590/S1413-81232008000500017.
- [45] Rubertsson C, Hellström J, Cross M, Sydsjö G. Anxiety in early pregnancy: prevalence and contributing factors. *Arch Womens Ment Health*. 2014;17(3):221–228. doi: 10.1007/s00737-013-0409-0.
- [46] Mottola MF, McLaughlin R. Exercise and pregnancy: Canadian guidelines for health care professionals. *Active Living*. 2011;22(4):1-4.
- [47] Domingues MR, Barros AJ. Leisure-time physical activity during pregnancy in the 2004 Pelotas Birth Cohort Study. *Revista de saude publica*. 2007;41:173-80.
- [48] Cramp AG, Bray SR. A prospective examination of exercise and barrier self-efficacy to engage in leisure-time physical activity during pregnancy. *Annals of Behavioral Medicine*. 2009 Jun 1;37(3):325-34.
- [49] Coll CV, Domingues MR, Gonçalves H, Bertoldi AD. Perceived barriers to leisure-time physical activity during pregnancy: A literature review of *Journal of science and medicine in sport*. 2017 Jan 1;20(1):17
- [50] Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity the evidence. *Cmaj*. 2006 Mar 14;174(6):801-



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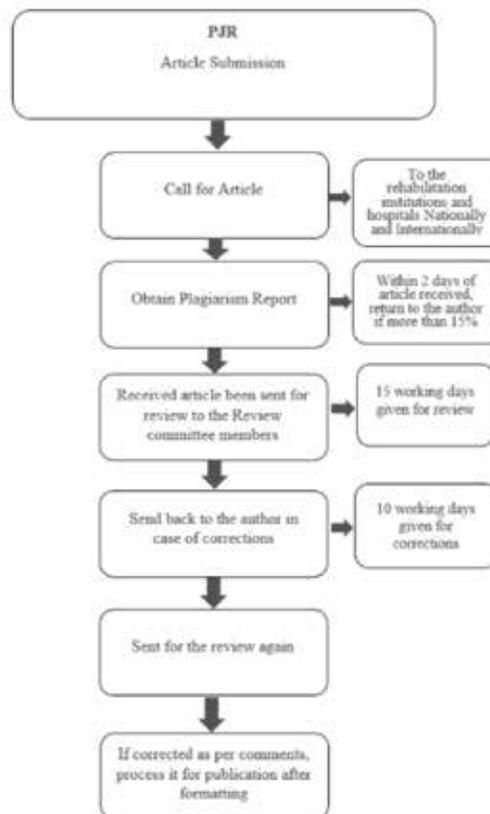
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- Outcome Measures
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