IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Prevalence And Factors Associated With Text-Neck Syndrome Among Adolescents Using Smartphones In Latur City.

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Abstract:

Background: Spasticity is a significant and challenging consequence of neurological conditions, often resulting in impaired mobility, discomfort, and a decline in quality of life. Conventional therapies, including pharmacological and surgical interventions, have limitations due to side effects and invasiveness. Extracorporeal shockwave therapy (ESWT) has gained attention as a novel, non-invasive therapeutic modality. **Objective:** This systematic review aims to evaluate and synthesize current evidence regarding the effectiveness of ESWT in reducing spasticity across various neurological disorders. **Methods:** A systematic literature search was conducted across four databases: PubMed, Scopus, Google Scholar, and Ovid, covering the period from January 2010 to December 2024. Search terms included "extracorporeal shockwave therapy," "ESWT," "spasticity," "stroke," "cerebral palsy," and "neurological rehabilitation." Inclusion criteria were studies involving human participants with neurologically induced spasticity treated with ESWT. Only studies employing objective measures such as the Modified Ashworth Scale (MAS), Fugl-Meyer Assessment (FMA), or electromyography (EMG) were included. A total of 11 studies were included in the qualitative synthesis. **Results:** The majority of the included studies were conducted in stroke populations, targeting both upper and lower limb spasticity. Both radial and focused ESWT were utilized, with variations in dosage, application frequency, and treatment site. All studies reported improvements in spasticity post-treatment, with MAS scores significantly reduced in most. Improvements were observed immediately and persisted up to four weeks post-intervention. Functional improvements in mobility and limb use were noted in studies measuring secondary outcomes. The musculotendinous junction appeared to be a more effective target site compared to muscle belly. **Conclusion:** ESWT is a promising adjunctive treatment for reducing spasticity in neurological conditions. It demonstrates efficacy in lowering muscle tone and improving functional outcomes with minimal side effects. Further large-scale, high-quality studies are warranted to optimize treatment parameters and assess long-term efficacy.

Index Terms - Text-Neck Syndrome, Adolescents, Smartphone Use, CNFDS, Musculoskeletal Health, Ergonomics

INTRODUCTION

Text-Neck Syndrome refers to a repetitive stress injury or overuse syndrome resulting from prolonged forward head posture during smartphone usage. This posture, typically characterized by flexion of the cervical spine, is increasingly observed among adolescents. Dr. Dean L. Fishman first coined the term "Text Neck" to describe this emerging musculoskeletal disorder.

With the proliferation of smartphones, adolescents often engage in screen-based activities for prolonged periods. According to current statistics, India had over 815 million smartphone users in 2020, a number that continues to grow. Adolescents aged 15-19 represent a demographic particularly susceptible to the ill effects of continuous digital exposure, given their high engagement in social media, gaming, academic applications, and other smartphone-based activities.

The World Health Organization (WHO) reports that neck pain is among the top ten causes of disability-adjusted life years (DALYs) in the adolescent population, surpassing other notable issues like asthma and alcohol use. Studies have identified that forward head posture associated with smartphone use contributes to changes in the cervical curvature, disc degeneration, spinal misalignment, and subsequent pain in the upper back, neck, and shoulders.

In the sagittal plane, forward head posture causes imbalances in the musculature, especially involving the suboccipital muscles, upper trapezius, levator scapulae, and cervical extensors. These imbalances lead to increased loading on intervertebral discs and may initiate degenerative processes if not addressed promptly.

The problem is not limited to musculoskeletal complications. Extended smartphone use is associated with sleep disturbances, poor concentration, visual strain, and psychological disorders like anxiety and depression. The ergonomics of device usage, including the angle of neck flexion and time spent in static posture, significantly influence the severity of symptoms.

Given the increasing reliance on mobile technology and the physical and psychological implications of prolonged usage, it becomes imperative to investigate the prevalence and consequences of Text-Neck Syndrome. This study focuses on adolescents in Latur city to provide a regional perspective on this growing health concern.

Need for the Study

Despite the growing awareness of smartphone-related health risks, most studies concentrate on psychological aspects like addiction and anxiety. There is a research gap concerning musculoskeletal complications, especially among adolescents in semi-urban regions like Latur.

The adolescence phase is critical for musculoskeletal development. Poor postural habits adopted during this period can result in long-term structural changes. Hence, early identification and intervention are vital. Evaluating the prevalence of Text-Neck Syndrome in this demographic will aid in formulating preventive and rehabilitative strategies tailored to adolescent needs.

Materials and Methods

This study employed an observational, cross-sectional design and was conducted over a duration of six months, including three months for data collection and another three months for data analysis. The study population comprised adolescents aged between 15 and 19 years who were regular smartphone users. The setting of the study was Latur City in the state of Maharashtra, India. A total of 98 participants were included in the sample, which was selected using a convenient sampling method. The primary tool used for assessment was the Copenhagen Neck Functional Disability Scale (CNFDS).

Participants were eligible for inclusion if they were within the age range of 15 to 19 years, used smartphones for at least one hour per day, and provided informed consent to participate. Adolescents were excluded from the study if they had congenital spinal deformities, traumatic cervical injuries, or any known

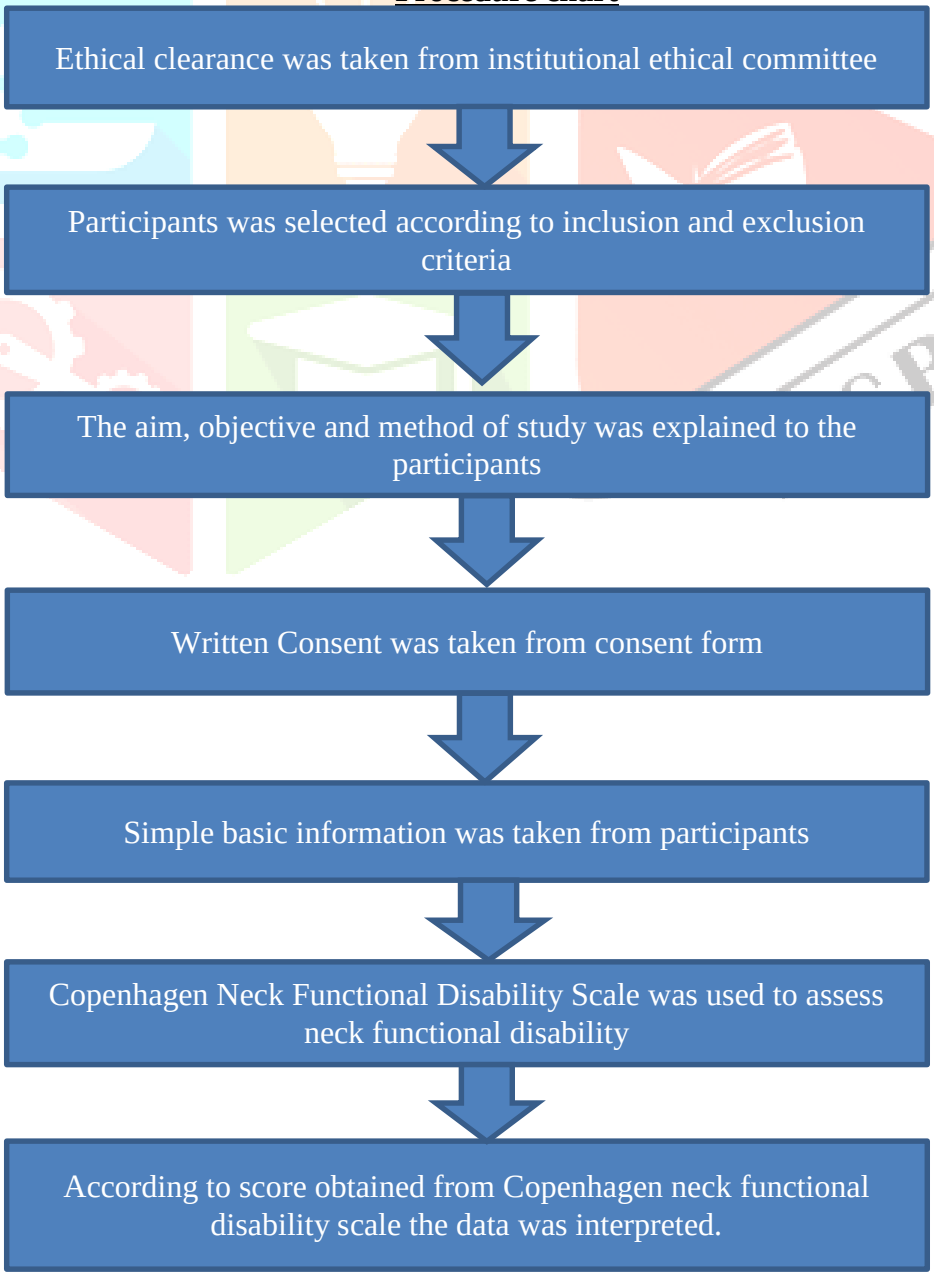
neurological or cardiovascular comorbidities. Individuals below 15 or above 19 years of age were also excluded.

Ethical approval for the study was obtained from the Institutional Ethical Committee. Participants were selected according to the predefined inclusion and exclusion criteria. After receiving a comprehensive explanation of the study protocol, each participant provided informed consent. The CNFDS was then administered in a language easily understood by the respondents. Participant responses were recorded, scored according to the CNFDS guidelines, and subjected to statistical analysis.

PROCEDURE

Ethical clearance was taken from the institutional ethical committee. Participants were selected according to inclusion and exclusion criteria. The aim, objective, and method of study was explained in detail to the participant. The Consent was taken from participant on the consent form. Simple basic information were taken from participants. If the participant is smart phone user, according to Copenhagen neck functional disability scale questionnaire was applied and marked. Copenhagen Neck Functional Disability Scale was used to asses neck functional disability in adolescents using smartphones .The scale and severity were evaluated on the basis of smartphone use and text neck syndrome in adolescents. Each individual was answering according to question asked and interview was taken of an individual. It was asked in their local understanding language. According to the score obtained from Copenhagen Neck Functional Disability Scale the data was interpreted. The collected data was analyzed and then the score was concluded.

Procedure chart



Outcome Measure

The outcome was measured using the Copenhagen Neck Functional Disability Scale (CNFDS), which consists of 15 questions. The first five items are positively oriented, while the remaining ten are negatively oriented. Responses were categorized as "Yes," "Sometimes," or "No" and scored as 0, 1, or 2 points depending on the direction of the item. The total score ranges from 0 to 30, with higher scores indicating greater neck-related disability.

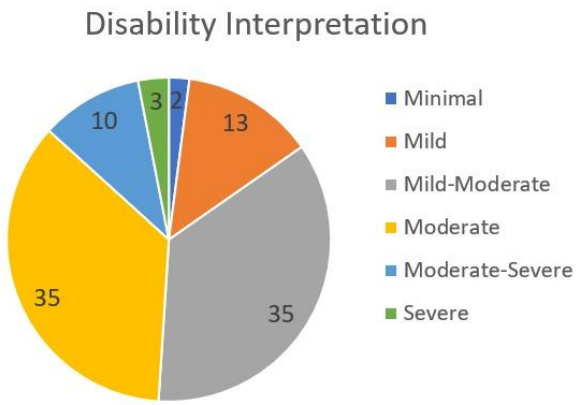
Disability was interpreted as follows:

- 1–3 points: Minimal
- 4–8 points: Mild
- 9–14 points: Mild to Moderate
- 15–20 points: Moderate
- 21–26 points: Moderate to Severe
- 27–30 points: Severe

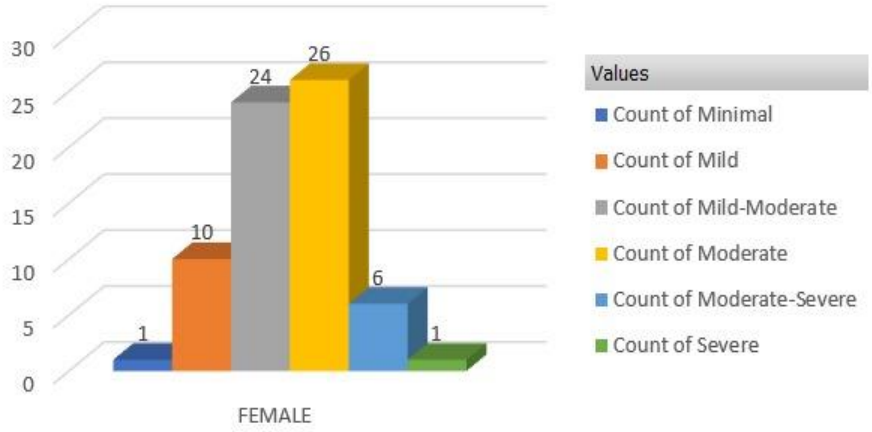
RESULT

A Total number of 98 subjects were included in this study. Graph 2-Table 1 shows 30.6%(n=30) male and 69.3% (n=68) of female participants were included in the study. Graph 3 -Table 2 shows, Age wise distribution in adolescents,15 years (n=24) 24.4%,16 years (n=22)22.4%,17 years(n=12)12.2%,18 years(n=12)12.2%,19 years (n=28)28.5% affected. Graph 4 shows, the result of text neck syndrome disability in which n=2 were suffering from minimal disability, n=13 were suffering from mild disability, n= 35 were suffering from moderate disability, n=35 were suffering from mild-moderate disability, n=10 were suffering from moderate-severe disability, n=3 were suffering from severe disability. Table 4 shows the prevalence of text neck syndrome among adolescents using smartphones. It reveals that the text neck syndrome was most frequently found in 19 years of age group with 28.5%, followed by 15 years of age group with 24.4%.

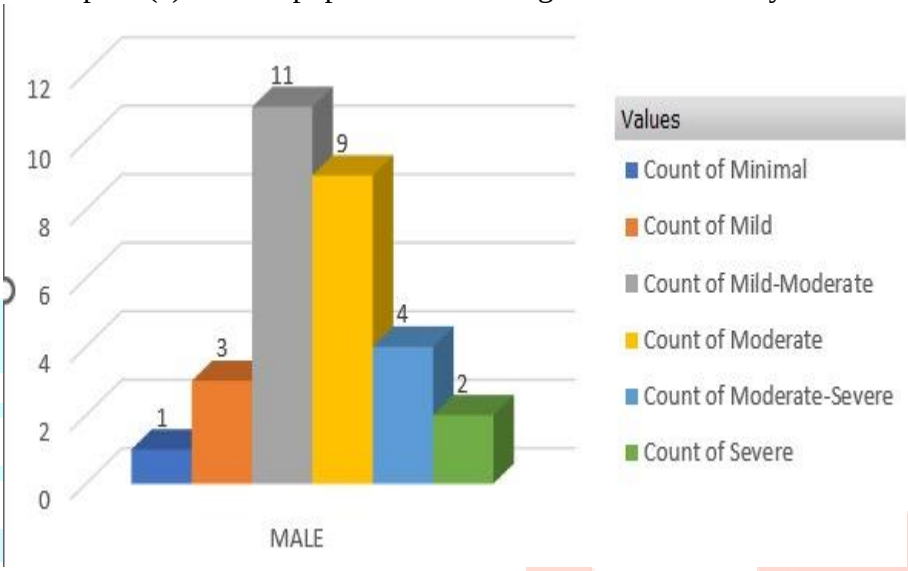
Graph 1: Disability Interpretation



Graph 1: Disability Interpretation among Adolescents suffering from text neck syndrome in Latur city.



Graph 2 (a) Female population suffering from text neck syndrome



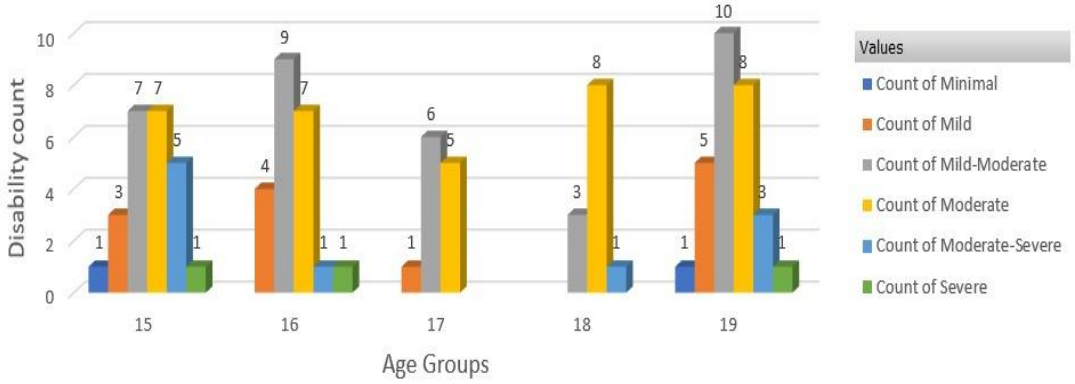
Graph 2 (b) Male population suffering from text neck syndrome

Graph 2: Gender Distribution among adolescents suffering from text neck syndrome

GENDER	FREQUENCY (n)	PERCENTAGE (%)
MALE	30	30.6%
FEMALE	68	69.3%
TOTAL	98	100%

Table 1: Gender distribution of adolescents suffering from text neck syndrome by using smartphones in Latur city

Graph 3: Age group distribution



Graph 3: Age group distribution among adolescents using smartphones in Latur city.

AGE GROUP	FREQUENCY(n)	PERCENTAGE (%)
15 years	24	24.4%
16 years	22	22.4%
17 years	12	12.2%
18 years	12	12.2%
19 years	28	28.5%
TOTAL	98	100%

Table 2: Represents age wise distribution of text-neck syndrome

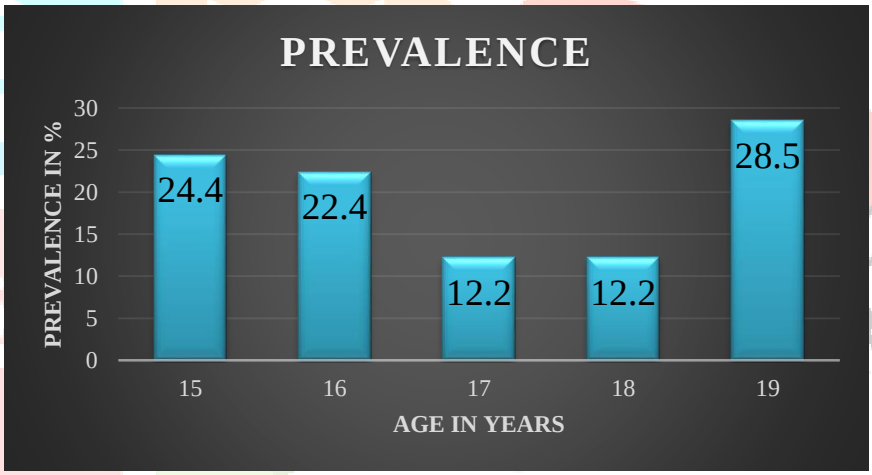
Graph 4: Type of disability

Graph 4: Disability type

Table 3 : Descriptive Analysis

Description	Results
Sample size	98
Mean	14.45
Median	14.5
Mode	10
Maximum	28
Minimum	2
Range	26
Sum	1416
Count	98
Standard deviation	5.82409
Standard Error	0.58832
Standard Variance	33.92005
Confidance level (95%)	1.15309

Interpretation – The table number 3 shows the descriptive data analysis mean and median with confidence level of 95%.



Graph 4: Prevalence of text neck syndrome among adolescents

DISCUSSION

The findings of this study indicate a significant prevalence of Text-Neck Syndrome among adolescents in Latur city, with varying degrees of musculoskeletal disability across different age groups. The highest prevalence was observed in 19-year-olds (28.5%), followed by 15-year-olds (24.4%) and 16-year-olds (22.4%), while 17-year-olds and 18-year-olds reported a comparatively lower prevalence of 12.2% each. These results suggest that the prolonged and improper use of smartphones may be contributing to postural issues and musculoskeletal discomfort among adolescents.

The variation in prevalence across different age groups could be attributed to differences in smartphone usage patterns, screen time duration, posture habits, and engagement in physical activities. Older adolescents may experience higher disability rates due to prolonged exposure to digital devices over time, while younger adolescents may be more adaptable or less affected due to shorter durations of smartphone use.

Comparing these findings with existing literature, previous studies have also reported a growing incidence of Text-Neck Syndrome among young individuals, particularly due to excessive use of mobile devices and poor ergonomic habits. Research suggests that forward head posture, prolonged

neck flexion, and lack of physical activity contribute to musculoskeletal strain, leading to chronic discomfort and, in severe cases, disability.

This study highlights the urgent need for awareness programs aimed at educating adolescents about the importance of proper posture, ergonomic smartphone use, and regular physical exercise. Schools and parents should encourage time management strategies for digital device usage and incorporate preventive measures such as posture correction exercises and periodic breaks from screen exposure.

Furthermore, future research should focus on assessing the long-term impact of Text-Neck Syndrome on spinal health and overall well-being. Studies investigating the effectiveness of posture correction interventions and digital wellness programs could help in developing comprehensive strategies to mitigate the risks associated with excessive smartphone usage among adolescents.

CONCLUSION

The study highlights the significant prevalence of Text-Neck Syndrome among adolescents in Latur city, emphasizing the growing impact of prolonged smartphone use on musculoskeletal health. The findings indicate that 19-year-old adolescents exhibited the highest percentage of disability (28.5%), followed by 15-year-olds (24.4%) and 16-year-olds (22.4%). Adolescents aged 17 and 18 years showed comparatively lower prevalence rates (12.2% each). These results underscore the need for awareness programs, posture correction strategies, and preventive measures to mitigate the adverse effects of excessive smartphone usage on adolescent health.

LIMITATION

- The age considered in this study is around 15-19 years.
- Adolescents were selected from Latur city.
- The study has been done in smaller number of Adolescents.

FUTURE SCOPE

- Study can be conducted in large sample.
- Sample can be taken from different age group, and cities.

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