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Correlation of mobile phone addiction scale and the scapular index in a sample of Nigerian college students.

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ABSTRACT

Background:Prolonged and frequent use of mobile phones, as well as the repeated movement of the upper extremities in an awkward posture, arethe main contributing factors to the incidence of musculoskeletal symptoms.

Objective:This study investigated the level of addiction to mobile phone use and its possiblecorrelation with the scapular posture in a cohort of undergraduate students of College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, Anambra state.

Methods:This survey was carried out on 235 (116 males and 119 females) students recruited through the purposive sampling technique, aged 18 to 29 years. The Mobile Phone Addiction Scale was used to determine the level of addiction while an inextensible measuring tape was used to measure the Scapular Index. Obtained data were summarized using mean and standard deviation, and analyzed using Independent t-test, and Pearson's Product Moment Correlation. The level of significance was set at < 0.05.

Results:There was a significant negative correlation between the Mobile Phone Addiction Scale score and the mean Scapular Index of the participants ($r=-0.853$, $p= <0.000$). There were significant gender differences in the values of the mean scapular index ($t=5.687$; $p=0.000$) and the level of mobile phone addiction ($t=-3.867$; $p=0.000$) between males and females, with males having a higher MPAS score and a lower Scapular Index than females.

Conclusions: Male students appeared more addicted to their mobile phones and presented worsescapular postures. Scapular Index significantly correlated with the Mobile phone addiction levelof the participants. Mobile phone users should be made aware of the possibility of posturaldistortions and efforts made to encourage proper adjustments.

Keywords: Mobile phone use, Posture, Scapular index

INTRODUCTION

The need to simplify life has given birth to many innovations which have been beneficial in different aspects of life; mobile phones being one of them. From connecting people via telephonic conversations to accessing the world in mere seconds, mobile phones have developed exponentially over the years. For many of us, it will be unfathomable to function without the conveniences that mobile phone has brought about in our daily lives[1]. In the past decade, the rate of mobile phone usage, hours, and frequency of use, has increased[2]. Mobile phone users spend more than 20 hours weekly on texting, emailing, and using the social network, representing the significant dependence on mobile phones for connecting and communicating with others[3].According to the Nigerian Communications Commission[4], the number of active mobile phone lines as of June 2019, was 172,485,805, recording an increase of 27,854,127 lines from 144,631,678 in December 2017. A recent study shows that 79% of the populations between the ages 18-44 years have their cell phones with them almost all the time[5]. The youth especially, are the predominant users of smartphones, college students can use their phones to keep up with assignments and class schedules, communicate with friends and colleagues, and become aware of campus alerts and warnings, added to the fact that they feel the need to keep in touch with their friends every second, every minute, and every hour. Mobile phones allow for an easy, fast, and convenient way to keep in touch with their friends and family[6]without knowing, the use of the mobile phone at every point in time becomes a habit. The escalation of its use from "habit" to an "addiction" is slowly increasing among the masses, with the need to evaluate the effect of steady use of mobile phones on the health of the public in general[7].

Addiction is the repeated use of a device or substance despite its negative effects[7]. Mobile phone addicts can be defined as persons who constantly check their phones every few minutes, and the urge to check the mobile phones becomes so strong that they cannot stop themselves even if they wish to, they become extremely attached with their mobile phone that they even start hallucinating that their phone is ringing even when it is not[8]. Mobile phone addicts carry their phones wherever they go and use them while doing other things like studying, eating, driving, and also using them in inappropriate places like church, class, lavatory, and danger zone areas like petrol pumps[8]. Consequently, the heavy reliance on the mobile phone may contribute to musculoskeletal injuries in the users. Therefore, health professionals should be aware of the effect of mobile phone use on physical health problems. The prolonged and frequent use of mobile phones, as well as the repeated movement of the upper extremities in an awkward posture, is the main contributing factor to the incidence of musculoskeletal symptoms[9]. Musculoskeletal symptoms, such as discomfort and pain, among mobile phone users not only occur in the neck but also in other areas of the body including shoulders, elbows, arms, wrists, hands, thumbs, and fingers[10].Generally, the typical posture when using mobile phones (or other touch-screen handheld devices) involves holding the tool with one or two hands below the eye level, looking down at the device, and using the thumbtotouch thescreen[10].Rounded shoulders occur when the shoulders are out ofproper alignment with the spine, and this cancause posture-related problems, such as backache. Any activity that causes the body to look down and forward for long periods can contribute to slumped shoulders[11]. These positions disrupt how the muscles in the neck, back, and shoulders normally function. It is these muscles that control the way the body maintains its posture throughout the day[11].

Recent advances in technology have increased the number of mobile phone users. In recent years, several studies have reported a substantial increase in the number of adolescent mobile phone users, and its association with musculoskeletal discomfort[11; 12; 13]. This is becoming a growing problem and will have a large impact globally. More so, it appears that there is a paucity of literature on mobile phone use in the Nigerian population and its relationship with posture, despite the alarming rate at which the population, especially the youth subject themselves to prolonged hours of either texting and reading with their mobile phones. Given the physiology of postural correction which underlies the physiotherapy management of posture-related disorders, there was, therefore, a need to find out if there is a significant correlation between phone addiction and the stress on the neck and shoulders.Therefore, this study aimed to measure the Scapular Index among participating students of College of Health Sciences, Nnamdi Azikiwe University, Nnewi Campus, Anambra state and correlate it with the Mobile Phone Addiction Scale scores.

METHODOLOGY

This ex-post facto research design involved 235 participants (116 males and 119 females) who were undergraduate students of the College of Health Sciences, Nnamdi Azikiwe University Nnewi campus, who met the inclusion criteria. They were selected using a purposive sampling technique. The procedures employed for the study were approved by the Ethics Review Committee of the Faculty of Health Sciences and Technology, College of Health Sciences, Nnamdi Azikiwe University, Nnewi, Anambra State, and permission was taken from the authority of the College for data collection, before the commencement of the study.The procedures were explained to the participants, and their informed consent was obtained before taking measurements. Participants' bio-data which included gender and age were obtained and recorded.The Mobile Phone Addiction Scale (MPAS) designed by Dr. A. Velayudhan and Dr. S. Srividya[14]was used for assessing mobile phone addiction. The literature reported high reliability of the MPAS (ICC=0.88)[14]. The scale consists of 37 items that are measured on a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The level of mobile phone addiction in the participants was determined by summing up the score in all the 37 items, higher score indicates a higher level of addiction.To assess for rounded shoulders, the participants' Scapular Indices were measured.Procedure for measuring the scapular index;

1. Each participant was made to stand in a relaxed posture with hands hanging by the sides.
2. The Coracoids process and Sternal notch were palpated and marked anteriorly.
3. The posterior boundary of the acromion process and the adjacent thoracic vertebral spine were palpated and marked too.

4. The distance between the above-mentioned points anteriorly and posteriorly was measured with the help of a measuring tape and noted for further computation.
The following formular was used for calculation of the scapular index;

Scapular index = (SN to CP X 100) / (PLA to TS);
Where, SN = Sternal notch,
CP = Coracoids process,
PLA = Postero Lateral Angle of acromion and
TS = Thoracic spine[15, 16]. (Figure 1, 2)

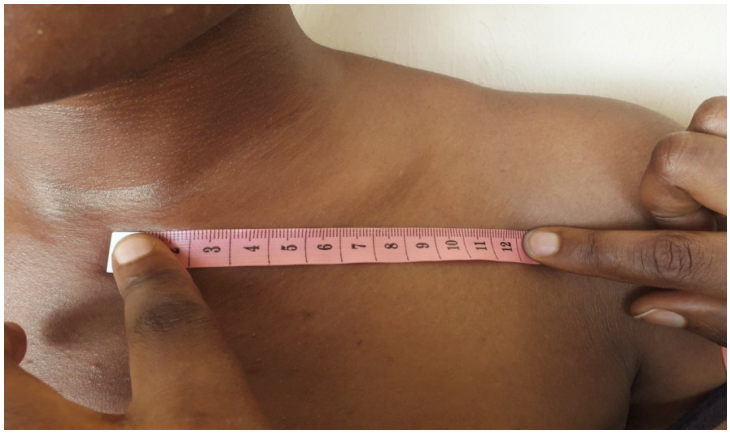


Figure 1: Showing one of the researchers measuring the distance between Sternal notch and Coracoids process



Figure 2:Showing one of the researchers measuring the distance between the posterolateral angle of the acromion and the corresponding thoracic spine

Data Analysis

The data collected were summarized using descriptive statistics of mean and standard deviation. The Pearson product-moment correlation coefficient was used to assess the relationship between MPAS and Scapular Index scores, and the Independent t-test was used to determine the influence of gender on the Scapular Index and Mobile Phone Addiction Scale. The level of significance was set at < 0.05 for all calculations.

RESULTS

The study involved two hundred and thirty-five participants (235) with a mean age of 21.91±2.26. The proportion of female participants was a bit higher (50.6%) than the male (49.4%). The proportion of the participants from various departments and their corresponding levels are seen below. There was a preponderance of participants from the Department of Medical Rehabilitation (23.4%), which was followed by those from the departments of Medical Laboratory Science (16.6%) and Radiography (16.2%). Departments of Medicine and Nursing are similar in proportion (11.1%), and to a less extent department of Anatomy (10.2%). Participants from Physiology (7.2%) and Environmental Health Sciences (4.3%) were least represented (Tables 4.1).

Table 4.1: Frequencies and percentage distribution of participants gender, department, and level (N=235)

DEMOGRAPHICS	FREQUENCY	PERCENTAGE (%)
GENDER: Male	116	49.4
Female	119	50.6
DEPT : ANAT	24	10.2
EHS	10	4.3
MED	26	11.1
MLS	39	16.6
MRH	55	23.4
NUR	26	11.1
PHYSIO	17	7.2
RAD	38	16.2
LEVEL : 200	60	25.5
300	78	33.2
400	53	22.6
500	44	18.7

Key:
N= Number of participants
DEPT= Department
ANAT= Anatomy
MED= Medicine
MLS= Medical Laboratory Science
EHS= Environmental Health Science
MRH= Medical Rehabilitation
NUR= Nursing Science
PHYSIO= Physiology
RAD= Radiography.

The mean value of the lateral angle of the acromion to the corresponding thoracic spine on both sides of the body of the participants is presented as 19.77±1.98 (for the right side) and 19.78±2.00 (for the left side). During the measurement of the Scapular Notch to the Coracoids Process, a similar mean value was seen on both sides 15.81±1.43 (for the right side) and 15.81±1.45 (for the left side). The mean Mobile Addition Scale of the participants was 111.16±16.59 whereas their mean Scapular Index was 80.36±7.20 (Table4.2).

Table 4.2: Physical characteristics, Mobile Phone Addiction Scale score, and Mean Scapular Index of all the Participants (N=235).

PARAMETERS	MEAN	STANDARD DEVIATION
Age(years)	21.91	±2.26
RT SN-CP(cm)	15.81	±1.43
LT SN-CP(cm)	15.81	±1.45
RT PLA-TS(cm)	19.77	±1.98
LT PLA-TS(cm)	19.78	± 2.00
RT SCI	80.37	±7.26
LT SCI	80.35	±7.25
MEAN SCI	80.36	±7.20
MPAS	111.16	±16.59

Key:
N= Number of participants
RT SN-CP= Right sternal notch to coracoid process
LT SN-CP= Left sternal notch to coracoid process
MPAS= Mobile phone addiction scale
LT SCI= Left scapular index
cm= Centimeters
RT SCI= Right scapular index
MEAN SCI= Mean scapular index
RT PLA-TS= Right posterolateral angle of the acromion to the corresponding thoracic spine
LT PLA-TS= Left posterolateral angle of the acromion to the corresponding thoracic spine

The correlation between the mobile phone addiction scale score and the mean scapular index was investigated using the Pearson Product Moment Correlation. Results showed a significant negative correlation (r=-0.853; p=0.000) between the mobile phone addiction scale score and the mean scapular index as shown in Table 4.3.

Table 4.3: Pearson's Product Moment Correlation of scores on the mobile phone addiction scale and mean scapular index of the participants. (N=235)

VARIABLES	r - value	p - value
MPAS vs. RIGHT SCI	-0.846**	0.000
MPAS vs. LEFT SCI	-0.848**	0.000

MPAS vs. MEAN SCI	-0.853**	0.000

Key:
MPAS= Mobile phone addiction scale
RT SCI= Right scapular index
LT SCI= Left scapular index
MEAN SCI= Mean scapular index
**= Significant correlation

An independent t-test was used to investigate gender differences in MPAS scores and Mean scapular indices of males and females as shown in Table 4.4. There were significant gender differences in the mean values of the scapular indices (t= 5.687; p< 0.000), and in the mean scores of the MPAS (t= -3.867; p=<0.000) between the males and females as shown in Table 4.4.

Table 4.4: Independent t-test Comparison of MPAS score and Mean scapular index of male and female Participants

VARIABLES	MALES(N=116) Mean ± S.D	FEMALES(N=119) Mean ± S.D	t-value	p - value
MEAN SCI	77.82±7.34	82.84±6.14	5.687	0.000
MPAS	115.28±16.97	107.14±15.24	-3.867	0.000

Key:
MEAN SCI= Mean scapular index
MPAS= Mobile phone addiction scale

DISCUSSION

The Mobile Phone Addiction Scale (MPAS) was used in this study to assess the level of mobile phone addiction and the Scapular Index of undergraduates'students of College of Health Sciences and Technology, Nnamdi Azikiwe University, NnewiCampus, with a view of ascertaining their likelihood or disposition to poor posture. This is based on the premise that chronic adoption of poor posture by these students would impact their neck and shoulder resting posture[1]. This study ascertainedthe possible correlation of mobile phone addiction with rounded shoulders. Since a slouched posture with shoulders protracted is considered a postural abnormality[12], mobile phone addiction could affect the postural alignment of shoulders. The scores on the MPAS and the Scapular Indices of the participants were found to be a significant negative correlation (r=-0.853, p= <0.000). As observed from the results of this study, the participants who showed a high level of mobile phone addiction had a decreased Scapular Index. This evaluation may imply that there is reciprocity of the Scapular Index and mobile phone addiction in the participants, possibly because of the increased stress load on the neck and shoulders in participants who spend more time on their mobile phones in a habitual posture of slouched shoulders with the scapular protracted, making the shoulders to adopt a rounded frame.

The findings obtained were similar to those obtained in the studies done by Park et al[15], Jung et al[16], Akodu, Akinbo and Young[17], and Salvi and Battin[1], who had achieved similar results on smart phone usage and its effects on the musculoskeletal system. Akodu, Akinbo, and Young[17], in their study, found a significant positive correlation between Smartphone addiction and scapular dyskinesis and also inferred that the high rate of Smartphone use by young people likely predisposes them to develop abnormalities in the scapular region. Subjects who showed high mobile phone addiction, maintained shoulder, and elbow in a flexed position. This posture was attained to hold the mobile phones, which eventuated to an increased rounded shoulder. If the alignment of the body is incorrect, the spinal stresses are increased, giving an inefficient spinal posture, which could even lead to upper-quarter pain. The findings of this study also agree with the result obtained by Salvi and Battin[1] which also showed a significant negative correlation between the Mobile Phone Addiction Scale and Scapular Index of 100 young adults pursuing their graduation and post-graduation degree in College of Physiotherapy, Mumbai. Their results also showed that the percentage of participants who appeared to be addicted to mobile phone use was higher than those who were not, with a mean MPAS score of 113.26±36.3. Similarly, the findings of this current study revealed a higher percentage of mobile phone addiction amongst participants; this could be as a result of the increased demand for mobile phone use in the participants due to its portability, accessibility, and affordability. This is also concordant with the results of Haug ET al[18] and Akodu, Akinbo, and Young[17], who noted that a larger population among the subjects was addicted to their mobile phones.

This study showed significant gender differences in the scores of MPAS between males and females. This may imply that the males in this study have a greater level of mobile phone addiction than females. This result is not consistent with the findings of Roberts, Yaya, and Manolis[7] in Texas and Chiu, Hong, and Chiu[19] in Taiwan, which reported that females tend to score higher than their male counterparts in the aspect mobile phone addiction. The differences could be as a result of instrumental/methodological variations, sample or population differences, and/or ethnic and racial differences.

This study also investigated the possible gender differences in the Scapular Indices of the participants. The results obtained showed significant gender differences in the values of the mean scapular index between males and females. The male participants in this study presented with lesser Scapular Indices than females, which could be inferred to be as a result of being more addicted to their mobile phones with resulting rounder shoulders than their female

counterparts. Although the findings are in line with the inference made so far, it is difficult to conclude on the findings obtained due to the non-existence of previous studies on the influence of gender differences in the scapular indices of the participants.

CONCLUSIONS

Male students appeared more addicted to their mobile phones and presented worsescapular postures. Scapular Index significantly correlated with the Mobile phone addiction levelof the participants. Mobile phone users should be made aware of the possibility of posturaldistortions and efforts made to encourage proper adjustments.

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