

PREVALENCE OF SMARTPHONE USAGE HABIT AND ITS ASSOCIATION WITH SYMPTOMS OF HAND DISCOMFORT

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ABSTRACT

Aim: The aim of the present study is to explore prevalence of Smartphone usage habits and it's association with hand Discomfort.

Introduction: This study addresses the relationship between Smartphone use related upper limb discomforts in various ages. As Smartphone become more and more ingrained in daily life, worries about their possible negative impact on both physical and mental health have emerged. The preliminary findings show a significant relationship, with differences identified across age group as, between excessive Smartphone usage and upper limb discomfort.

Methods of study: Employing a random sampling technique, this cross-sectional investigation was conducted in Lucknow city. A total of 180 respondents have been selected for this investigation. Male and female participants were drawn at random from age groups (i.e., 18- 60). While responding out the Cornell Hand Discomfort Questionnaire (CHDQ), and Smartphone Addiction Scale-Short Form (SAS-SF) questionnaires, candidates were asked for their permission.

Results & Findings: The study found a modestly significantly positive correlation ($r = .388, p < .01$) between hand discomfort and Smartphone addiction among 180 respondents, suggesting a positive relationship between Smartphone addiction and hand discomfort.

Conclusion: The study found that among the 180 respondents (90 men and 90 women) from Lucknow, ages 18 to 60, there is a moderate, statistically significant positive association ($r = .388, p < .01$) between Smartphone addiction and hand discomfort. A greater amount of hand discomfort is linked to higher levels of Smartphone addiction. Since that there were only significant gender differences in the wrist area (region F), this relationship suggests the potential requirement for therapies targeted at lowering Smartphone addiction to relieve accompanying hand discomfort.

Keywords: Smartphone Usage, Hand Discomfort, Smartphone Usage & hand Discomfort, Psychological wellness.

INTRODUCTION

Information technology is the term used to describe the the 21st century. The communication operations have seen major developments as a result of the extraordinary advancements of wireless communication and the internet. 2007 saw the launching of the first smartphone (Ratan et al., 2021). Since then, smartphones have evolved into an everyday requirement in every society. Over the last ten years, there has been a huge increase in smartphone ownership and use. For example, the World Health Organization (WHO) estimated that there were over 2.1 billion smartphone users globally in 2017 and that figure would rise to nearly 7.26 billion by 2022 (Laricchia 2023). India has the second-highest number of smartphone users worldwide, behind China (Nehra et al., 2012).

Many smartphone users report having thumb or wrist pain, yet it is unknown if individuals who feel pain are also smartphone addicts. According to earlier research, using electronic devices or other items that need frequent thumb movement would put more strain on the thumb and increase the likelihood of developing musculoskeletal diseases (Ali et al., 2014 & Woo et al., 2016). Technology-related equipment includes touch screen smart phones, mobile phones, keypad phones, and computer tablets are examples of mobile handheld gadgets that are frequently used for communication and happiness. Due to its affordability and ease of use, almost all age groups, from kids to adults, own at least one kind of mobile handheld gadget these days. Many usability options, intriguing programs, and convenient internet access are what entice users, particularly children, to spend a lot of time using mobile handheld devices like smartphones and tablet computers. According to a survey conducted in Canada among 137 university personnel, instructors, and students, participants used mobile portable devices for 4.65 hours a day (Berolo et al., 2011). Excessive usage of mobile devices has been linked to musculoskeletal complaints and general indications of sickness (Berolo et al., 2011, Chu et al., 2011).

People from many areas of life use mobile computers extensively. These days, it's practically a need in life, particularly for students. The majority of boys and girls slouched forward for work-related activities while assuming a posture of neck neutrality and neck flexion for intellectual pursuits. Both boys and girls often dedicate more time to work and academic pursuits. It is also noted that a comparatively tiny portion of laptop users employ peripherals for their phones and laptops for different types of jobs. To reduce their postural pain, students must receive the proper instruction on the postures to be employed (Mishra, S., & Kiran, U. V. 2013).

A few advantages of smartphones are that they may be used for a variety of things, such as increasing productivity, finding information, interacting with others, relaxing, and having fun (Deursen et al., 2015). The smartphone is a technological innovation that has become extremely widespread and significant in modern culture. It provides an additional compact computing platform than many other devices, including laptops and smartphones (Barnes et al., 2019 and Bernroider et al., 2014). Drivers for taxis are particularly prone to musculoskeletal disorders because of their prolonged sitting, intense body vibration, and heavy lifting. Musculoskeletal disorders in taxi drivers may be associated with psychosocial work concerns, such as sentiments of unfair treatment, stress at work, and an uneven effort-reward ratio (Srivastava, S., & Kiran, U. V. 2014). The use of smart phones has changed family relations, emancipative attitudes, social contacts, everyday routines, and behavior in public. Thomee et al. (2011) found a correlation between continuously checking and/or utilizing smartphone applications around-the-clock and a lower level of physical activity, poor academic performance, anxiety, tension, withdrawal, and difficulties falling asleep. Smartphone usage is common in many contexts, such as the business, personal life, and dealings with both public and private organizations. It is currently thought that there are more smartphone users worldwide than there are people, which help to explain this (Konok et al., 2017).

The Addiction Construct in Relation to Smartphone Use

In a few studies, 46% of smartphone owners indicated that they "could not live without" their phones (Smith and Page, 2015, April 1). When separated from smartphones, many individuals experience mounting anxiety (Cheever et al., 2014) and physiological withdrawal-like symptoms (Clayton et al., 2015). Many individuals experience phantom smartphone vibrations even in the absence of incoming phone notifications (Kruger and Djerf, 2016). This term in relation to smartphones has been additionally referred to as "addiction," "excessive use," "compulsive use," and "compensatory use," in addition to "problematic smartphone use." (Kardefelt-Winther, 2014; Widyanto and Griffiths, 2006).

This exercise includes an individual being stationary for an extended period of time, which wears down the muscles and can result in a variety of musculoskeletal conditions. (Mustafaoglu et al., 2021). Furthermore, addiction to mobile phones has recently been found to be linked to stress, poor sleep, behavioral abnormalities, fluctuating emotions, and even despair. Compared to the previous generation, students are more reliant on smartphones and may be more susceptible to smartphone addiction (Chen et al., 2017). According to a recent Indian study, 46.9% of students reported having neck discomfort and 29.2% experienced thumb pain as a result of using their smartphones for extended periods of time (Ahmed et al., 2021). According to both Neupane et al. (2017) and Kim et al. (2015), using a smartphone for extended periods can cause shoulder, neck, and upper back pain. Upper limb musculoskeletal pain (Sharan et al., 2014), discomfort in the hands and neck, as well as muscular pain in the hands, shoulders, and neck (Ahmed et al., 2021 & Ahmed et al., 2019)

MATERIALS & METHODS

SELECTION OF SAMPLE

A total of 180 respondents were selected from the Lucknow city using multistage random selection. There were 90 male and 90 female respondents, from 18 to 60 years of age.

Smartphone addiction (SAS)

The SAS is composed of 10 questions with a 6-point Likert scale. The scale ranges from 6 for strongly agree to strongly disagree. The overall score spans from 10 to 60. Increased risk of smartphone addiction is indicated by a higher score. The smartphone addiction assessment instrument is valid and dependable. Cronbach's alpha, which was 0.911 in the adolescent sample, confirmed the internal consistency of SAS (Kwon et al., 2013).

Cornell Hand Discomfort Questionnaire (CHDQ)

The six questions included on the questionnaire address the following subjects: 1. Musculoskeletal pain frequency; 2. Discomfort; and 3. Interference with work during the previous week. A hand mapping schematic with six colored hand regions is also included. More discomfort was indicated by higher scores. The overall discomfort score was computed using the formula Frequency × discomfort × interference. The top score of 90 0 for each area and 560 overall for the six areas is the maximum that may be achieved. Greater discomfort is indicated by higher readings. The CMDQ's validity was thoroughly tested by Dr. Oguzhan Erdinc in Turkey, and the findings were encouraging (Erdoğan et al., 2008).

DATA COLLECTION

Two questionnaires were used: an SAS with ten items on a 6-point Likert scale, and a self-made sociodemographic questionnaire for determining the respondents' demographic profile. On this scale, 1 represents strongly disagreeing, while 6 represents strongly agreeing. The measurement tool for smartphone addiction is reliable and valid. Cronbach's alpha of 0.911 in the adolescent population confirmed the internal consistency of SAS. The CHDQ is a useful tool for calculating hand discomfort. CHDQ is an effective instrument for measuring hand discomfort. The questionnaire covers three domains: pain experience, pain discomforts, and pain interference. Total discomfort scale was determined by multiplying frequency, unpleasantness, and interference. A single hand's highest score for a shaded area is 90, and the combined score for all six shaded areas is 540.

STATISTICAL ANALYSIS

Software entitled SPSS 20.0 was used for data analysis. The continuous variables are shown using the mean and 95% confidence intervals. Categorical variables are represented by percentages and frequencies (in numerical form). The link between SAS, and CHDQ was ascertained through the application of correlation coefficient. The ANOVA test and the T-test were used to look at differences between the various data groups.

RESULTS AND DISCUSSION

Following the completion of the current study, we aim to investigate, from a scientific standpoint, the relationship between hand discomfort and Smartphone use habits in male & female.

Table 1: Socio-demographic details of the respondents.

S. No.	Category	Frequency (in n)	Percentage (in %)
Age	18-30	90	50.0
	30-60	90	50.0
	Total	180	100.0
Gender	Male	90	50
	Female	90	50
	Total	180	100.0
Family type	Nuclear	124	58.9
	Joint	56	31.1
	Total	180	100.0
Working status	Working	93	51.7
	Non-working	87	48.3
	Total	180	100.0

The above given Table 1 summarizes the socio-demographic information of all respondents. Out of 180 respondents 90 were male and 90 were female. 51% participants were working and 48.3% non-working There are 124 (58.9 %) respondents from nuclear family and 56(31.1 % respondents from joint family.

TABLE 2: Pain experience in different shaded areas of hand across both the genders.

		Male	Female	Total	p-value
Area A	Never	70(26.0%)	4 (23.8%)	134(49.8%)	.967
	1-2 Time Last Week	10 (3.7%)	13 (4.8%)	23(8.6%)	
	3-4time Last week	4 (1.5%)	5 (1.9%)	9(3.3%)	
	Once Every Day	3 (1.1%)	7 (2.6%)	10(3.7%)	
	Several Times Every Day	3 (1.1%)	1 (.4%)	4 (1.5%)	
Area B	Never	66(24.5%)	62(23.0%)	128(47.6%)	.576
	1-2 Time Last Week	18(6.7%)	21(7.8%)	39(14.5%)	
	3-4time Last week	1(.4%)	4(1.5%)	5(1.9%)	
	Once Every Day	4(1.5%)	1(.4%)	5(1.9%)	
	Several Times Every Day	1(.4%)	2(.7%)	3(1.1%)	
Area C	Never	61(22.7%)	61(22.7%)	122(45.4%)	.315
	1-2 Time Last Week	18(6.7%)	17(6.3%)	35(13.0%)	
	3-4time Last week	6(2.2%)	4(1.5%)	10(3.7%)	
	Once Every Day	4(1.5%)	4(1.5%)	8(3.0%)	
	Several Times Every Day	1(.4%)	4(1.5%)	5(1.9%)	
Area D	Never	55(20.4%)	39(14.5%)	94(34.9%)	.171
	1-2 Time Last Week	17(6.3%)	28(10.4%)	45(16.7%)	
	3-4time Last week	12(4.5%)	15(5.6%)	27(10%)	
	Once Every Day	3(1.1%)	7(2.6%)	10(3.7%)	
	Several Times Every Day	3(1.1%)	1(.4%)	1(1.5%)	
Area E	Never	61(22.7%)	55(20.4%)	116(43.1%)	.472
	1-2 Time Last Week	20(7.4%)	27(10.0%)	47(17.5%)	
	3-4time Last week	7(2.6%)	4(1.5%)	11(4.1) %	
	Once Every Day	1(.4%)	3(1.1%)	4(1.5%)	
	Several Times Every Day	1(.4%)	1(.4%)	2(.7%)	
Area F	Never	59(21.9%)	51(19.0%)	110(40.9%)	<.001
	1-2 Time Last Week	14(5.2%)	15(5.6%)	29(10.8%)	
	3-4time Last week	14(5.2%)	20(7.4%)	34(12.6%)	
	Once Every Day	2(.7%)	3(1.1%)	5(1.9%)	
	Several Times Every Day	1(.4%)	1(.4%)	2(.7%)	

The above given table 2 represents the frequency and percentage of pain experienced by males and females in the various shaded areas of right hand, based on a total sample size of 180. Each area reflects a spectrum of pain experience, from "Never" to "Several Times Every Day". For each shaded area, a p-value, or statistical significance, was provided. Overall, there were no appreciable variations in how pain was perceived in areas A, B, C, and E. But in region F, there was a noticeable difference between the genders ($p = 0.001$). Ache, pain, and discomfort were reported by the greatest proportion of men (3.7%) and women (4.8%), 1-2 times a week. In shaded area A (i.e. index, middle, and half ring), the highest percentage of men (1.1%) and women (0.4%) reported having aches, pains, and discomforts several times a day, and the largest percentage of men (6.7%) and women (7.8%) reported having aches, pains, and discomforts 1-2 times in the previous week. Ache, pain, and discomfort were reported by the largest percentage of males (0.4%) and females (0.7%) multiple times each day in shaded area B (little finger half ring). The majority of men (6.7%) and women (6.3%) reported having pain in one or both of the previous two weeks. In shade area C (thumb), the largest percentage of males (.4%) and females (1.5%) reported feeling ache, pain, and discomfort several times a day, and the highest percentage of males (6.3%) and females (10.4%) reported feeling ache, pain, and discomfort 1-2 times in the previous week. In shade area D (palm), the lowest number of males (1.1%) and 0.4%) reported feeling ache, pain, and discomfort several times per day, while the highest percentage of males (7.4%) and females (10.0%) reported feeling ache, pain, and discomfort one or two times during the last week. In shade area E (thumb joint), a majority of men (0.4%) and women (0.4%) reported having ache, pain, and discomfort several times a day, and the largest percentage of men (5.2%) and women (5.6%) reported having ache, pain, and discomfort 1-2 times per week. Conversely, the lowest percentage of men

(0.4%) and women (0.4%) in shade region F (wrist) report having aches, pains, and discomfort on several occasions each day.

Table 3: Distribution of male and female on the basis of experience of feeling of uncomforted ache, pain, discomfort

	How uncomfortable	Male	Female	Total	p-value
Area A	No uncomfortable	70(77.8%)	64(71.1%)	134(74.0%)	.710
	Slightly uncomfortable	8(8.9%)	14 (15.6%)	22(12.2%)	
	Moderately uncomfortable	9(10.0%)	10(11.1%)	19(10.5)	
	Very uncomfortable	3(3.3%)	2(2.2%)	5(2.8%)	
Area B	No uncomfortable	67(74.4%)	65(72.2%)	132(72.9%)	.126
	Slightly uncomfortable	12(13.3%)	18(20.0%)	30(16.6%)	
	Moderately uncomfortable	8(8.9%)	7(7.8%)	15(8.3%)	
	Very uncomfortable	3(3.3%)	0(0.0%)	3(1.7%)	
Area C	No uncomfortable	64(71.1%)	61(67.8%)	125(69.1%)	.782
	Slightly uncomfortable	9(10.0%)	12(13.3%)	21(11.6%)	
	Moderately uncomfortable	12(13.0%)	14(15.6%)	26(14.4%)	
	Very uncomfortable	5(5.6%)	3(3.3%)	8(4.4%)	
Area D	No uncomfortable	52(57.8%)	39(43.3%)	91(50.3%)	.473
	Slightly uncomfortable	11(12.2%)	18(38.9%)	29(16.0%)	
	Moderately uncomfortable	25(27.8%)	32(16.7%)	57(31.5%)	
	Very uncomfortable	2(2.2%)	1(1.1%)	3(1.7%)	
Area E	No uncomfortable	63(70.0%)	58(64.4%)	121(66.9%)	.657
	Slightly uncomfortable	11(12.2%)	13(14.4%)	24(13.3%)	
	Moderately uncomfortable	13(14.4%)	18(20.0%)	31(17.1%)	
	Very uncomfortable	3(3.3%)	1(1.1%)	4(2.2%)	
Area F	No uncomfortable	61(67.8%)	48(53.3%)	109(60.2%)	.482
	Slightly uncomfortable	16(17.8%)	37(41.1%)	53(29.3%)	
	Moderately uncomfortable	11(12.2%)	0(0.0%)	11(6.1%)	
	Very uncomfortable	2(2.2%)	5(5.6%)	7(3.9%)	

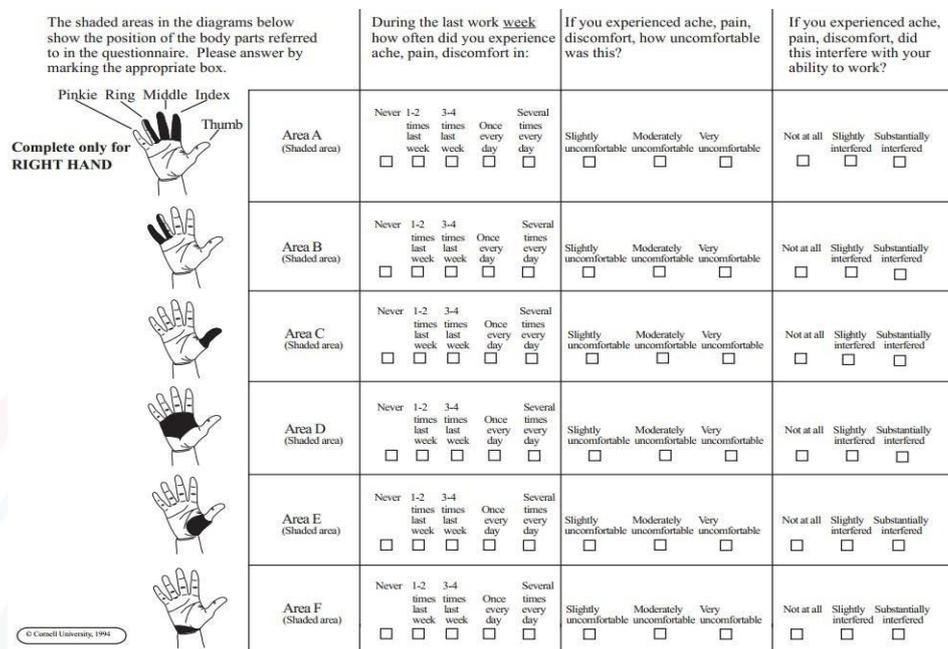
The above given table 3 gives the summary of level of discomfort experienced in different shaded areas of hand among both males and females. They are given below as follows-Area A: There was no significant difference in discomfort levels between males and females ($p = 0.710$). The majority of respondents who were male (71.8%) and female (71.1%) said they were not uncomfortable. Just 2.2% of women and 3.3% of men said they were extremely uncomfortable. Area B: There is not a significant difference in discomfort between men and women ($p = 0.126$). Males (74.4%) and females (72.2%) reported being in no discomfort at similar proportions. Not a single woman said she was extremely uncomfortable here. Area C: ($P = 0.782$) indicates that there is no discernible pain difference between males and females. The majority of respondents who were male (71.1%) and female (67.8%) said they were not uncomfortable. A comparable percentage said they were only mildly uncomfortable. Area D: There was no significant difference in discomfort between both genders ($p = 0.473$). A higher percentage of men (27.8%) than women (16.7%) said they were slightly uncomfortable. Compared to men (12.2%), more women (38.9%) said they felt a little uneasy. Area E: There was no statistically significant difference in discomfort between the sexes ($p = 0.657$). The majority of respondents who were male (70.0%) and female (64.4%) said they were not uncomfortable. A comparable percentage said they were only mildly uncomfortable. Area F: ($P = 0.482$) indicates that there is no discernible pain difference between males and females. Compared to men (17.8%), more women (41.1%) said they felt a little uneasy. Compared to women (0%), few men (12.2%) reported feeling quite uncomfortable. Ultimately, distinct areas have different levels of discomfort; however, there is no identifiable pattern in the distinctions between male and female perceptions of discomfort throughout these shaded areas.

TABLE4: Interference in ability due to male and female Experience of ache, pain, discomfort.

		Male	Female	Total	p-value
Area A	Not at all	83(92.22%)	82(91.11%)	165(91.67%)	.369
	Slightly interfered	7(7.78%)	8(8.89%)	15 (8.33%)	
	Substantially interfered	0(0.0 %)	0 (0.0 %)	0 (0.0 %)	
Area B	Not at all	85(94.44%)	82(91.11%)	167(92.78%)	.203
	Slightly interfered	4(4.44 %)	8(8.89%)	12(6.67%)	
	Substantially interfered	1(1.11%)	0(0.0 %)	1(1.11%)	
Area C	Not at all	77 (85.56%)	76(84.44%)	153(85%)	.807
	Slightly interfered	9(10%)	13(14.44%)	22(12.22%)	
	Substantially interfered	4(4.44%)	1(1.11%)	5(2.78%)	
Area D	Not at all	72 (80%)	74(82.22%)	146(81.11%)	.072
	Slightly interfered	14(15.56%)	15(16.67%)	29(16.11%)	
	Substantially interfered	4(4.44%)	1(1.11%)	5(2.78%)	
Area E	Not at all	78(86.67%)	80(88.89%)	158(87.78%)	.476
	Slightly interfered	10(11.11%)	10(11.11%)	20(11.11)	
	Substantially interfered	2(2.22%)	0(0.0 %)	2(2.22%)	
Area F	Not at all	81(90%)	87(96.67%)	168(93.33%)	.404
	Slightly interfered	7(7.78%)	1(1.11%)	8(4.44%)	
	Substantially interfered	2(2.22%)	2(2.22%)	4(4.44%)	

The above given table 4 describe Interference ability due to male and female experience of ache, pain, discomfort, Area A: The majority of respondents indicated "Not at all" interference, including 92.22% of men and 91.11% of women. There were no reports of "Substantially interfered," only a minor fraction of "Slightly interfered." Male and female interference levels are not significantly different ($p = 0.369$). Area B: The majority of participants once more indicated that there was "Not at all" interference; males' percentages were somewhat higher (94.44%) than females' (91.11%). "Slightly interfered," according to some participants, with a slight gender difference. A single known case of "Substantially interfered" included a male participant. Male and female interference levels do not significantly differ from one another ($p = 0.203$). Area C: The same trends were seen, with most respondents stating that there was "Not at all" interference. The percentage of female respondents who said they had been "slightly interfered" was slightly higher than that of male respondents. "Substantially interfered" has been used in a few situations, with a slightly higher percentage for men. Gender differences in interference levels are not significantly different ($p = 0.807$). Area D: A higher percentage of men than women reported "Not at all" interference, with the majority reporting "Not at all." Both men and women reported feeling "Slightly interfered with" at identical percentages. There were a few "Substantially interfered" reports, with a somewhat larger percentage of males. There was a slight variation in the amounts of interference between the sexes ($p = 0.072$). Area E: The majority of participants once more reported "Not at all" interference. Male and female respondents to being "Slightly interfered" indicated similar percentages. A few "Substantially interfered" cases, all involving men. Gender differences in interference levels are not statistically significant ($p = 0.476$). Area F: The majority, with

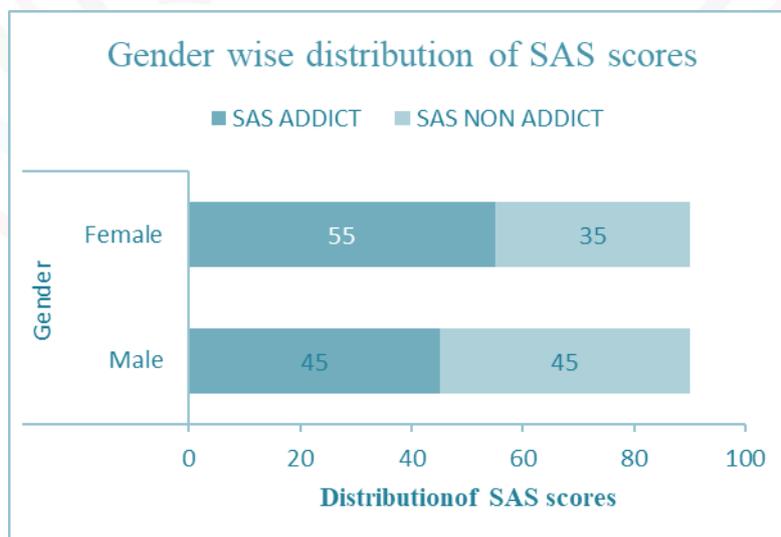
somewhat greater percentages for females, indicated "Not at all" interference. A minor percentage—with a discernible gender difference—reported being "Slightly interfered with." Both genders reported the same number of "substantially interfered" incidents. Gender differences in interference levels are not statistically significant.



Above Fig 1 describe right hand different shaded area, shaded area A (index, middle, half ring) shaded area B (little finger half ring) shaded area C (thumb) shaded area D (palm) shaded area E (thumb joint) shaded area F (wrist).

TABLE 4: Showing the descriptive statistics of scores on SAS scale.

	SAS	Gender of the respondent		Total
		Male	Female	
1	ADDICT	45	55	100
2	NON ADDICT	45	35	80
	Total	90	90	180



Gender wise distribution of SAS scores

Table 4 above shows the scores of 180 respondents on the Smartphone Addiction Scale (SAS). Of the male respondents, 50% have been classified as non-addicts and the other 50% as addicts. 38.89% of the female respondents were classified as non-addicts, while 61.11% of them were classified as addicts. In all, 55.56% of the of respondents have been classified as addicts and 44.44% of respondents as non-addicts.

TABLE 5: Showing the Level of smartphone addiction of the respondents:

Gender	Level of smartphone addiction				Total
	No addiction (10-33)	Low addiction (33-42)	Moderate addiction (42-57)	Severe Addiction (51-60)	
Male	45	24	21	0	90
Female	35	38	17	0	90
Total	80	62	38	0	180

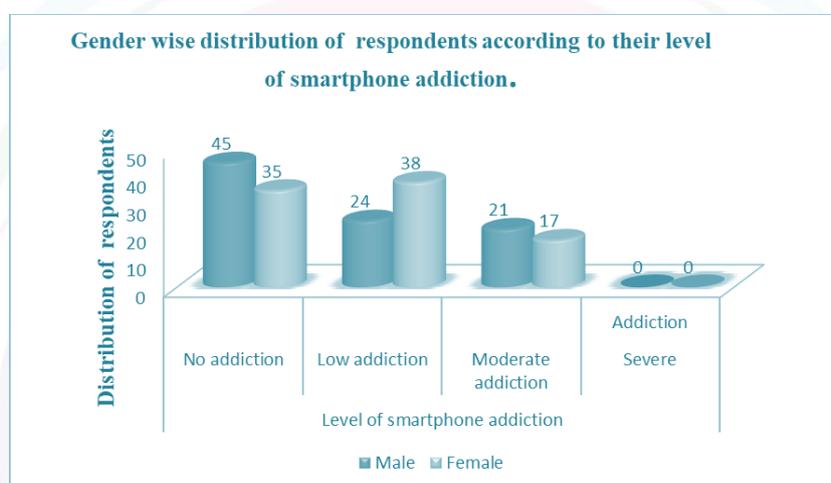


Figure: Gender wise distribution of respondents according to their level of smartphone addiction.

The above given table appears to show respondents' levels of smartphone addiction according to gender. Four categories are used to classify the level of addiction: "No addiction," "Low addiction," "Moderate addiction," and "Severe addiction." Out of 90 the respondents that were male, 45 were classified as having "No addiction," 24 as having "Low addiction," and 21 as having "Moderate addiction". Out of 90 the respondents that were female, 35 were classified as having "No addiction," 38 as having "Low addiction," and 17 as having "Moderate addiction". In terms of gender, neither responder falls into the "Severe addiction" group.

TABLE -12: Correlation coefficients between Smartphone and CHDQ

	SAS	CHDQ
SAS	1	
CHDQ	.388**	1

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

The correlation coefficient between SAS and CHDQ is .388 in the supplied correlation matrix, indicating a moderately notable positive connection that is statistically significant. This indicates that CHDQ likely will increase in addition to SAS. The statistical significance (shown by **, usually at $p < .01$) certifies a significant relationship between the two variables by demonstrating that the correlation is unlikely to be the result of chance. Depending on the particular context of SAS and CHDQ, this conclusion indicate that differences in one variable are connected with differences in the other, which can be helpful in predicting purposes and may lead future study or intervention initiatives.

SUMMARY

The study employed multistage random selection to investigate the association between hand discomfort and smartphone addiction among 180 respondents (90 men and 90 women) from Lucknow, ages 18 to 60. The two main instruments used were the Cornell Hand Discomfort Questionnaire (CHDQ), which measures hand discomfort through questions on pain frequency, discomfort, and work interference, with a maximum score of 540, and the Smartphone Addiction Scale (SAS), which consists of 10 questions on a 6-point Likert scale (ranging from 10 to 60, with higher scores indicating greater addiction). With the use of SPSS 20.0, the data was examined. Categorical variables were shown as percentages and frequencies, while continuous variables were shown as averages with 95% confidence intervals. T-tests, ANOVA, and correlation coefficients were used in the investigation.

Based to the respondents' sociodemographic profile, 58.9% of them were from nuclear families, 31.1% from joint families, and 51% from working families. The gender differences in pain and discomfort were not statistically significant in most hand locations, with the exception of region F (the wrist), where there was a significant difference between males and girls ($p = 0.001$). In every area, the majority of respondents stated that hand discomfort interfered "Not at all" with their ability to do their jobs, with only slight, statistically insignificant gender differences. With regard to smartphone addiction, 55.56% of respondents overall 50% of male respondents and 61.11% of female respondents were classed as addicts.

The study identified a moderate, statistically significant positive correlation ($p < .01$) between SAS and CHDQ, with a correlation value of .388. This shows that a stronger addiction to smartphones is linked to more hand discomfort. The results suggest that hand discomfort rises with smartphone addiction, underscoring the possibility of using therapies targeted at lowering smartphone addiction to lessen related physical discomfort. The meaningful link highlighted by the statistically significant correlation can guide future research and intervention efforts as well as predictive models.

RESULT

The study found a modestly significantly positive correlation ($r = .388$, $p < .01$) between hand discomfort and smartphone addiction among 180 respondents, suggesting a positive relationship between smartphone addiction and hand discomfort.

CONCLUSION

The study found that among the 180 respondents (90 men and 90 women) from Lucknow, ages 18 to 60, there is a moderate, statistically significant positive association ($r = .388$, $p < .01$) between smartphone addiction and hand discomfort. An greater amount of hand discomfort is linked to higher levels of smartphone addiction. Since that there were only significant gender differences in the wrist area (region F), this relationship suggests the potential requirement for therapies targeted at lowering smartphone addiction to relieve accompanying hand discomfort.

DISCUSSION

The present study's findings demonstrated a substantial correlation between the participants' musculoskeletal discomfort and the extent of smartphone influence. SAS and CHDQ both showed a significant moderate positive connection ($p < 0.01$).

Smartphone addiction has been associated with upper-limb pain (Lee et al., 2018). Karthikeyan and colleagues found that although it may negatively affect a person's depression, it has no effect on the cranio-vertebral angle. The results of this study are consistent with those of previous studies. According to Shah and Sheth (2018), students who are addicted to smartphones may develop short-term musculoskeletal problems in their hands (especially the thumb) and neck, which may lead to long-term limitation (Ahmed et al., 2022). Addiction to smartphones has both positive and negative associations with musculoskeletal pain in the hands, elbows, shoulders, and neck. upper extremity musculoskeletal diseases, according to Ahmed et al. (2019), 54% of students enrolled in physiotherapy courses reported experiencing musculoskeletal problems in their thumb, wrist, neck, and shoulder. As a result, these students are nomophobic smartphone users. A 2012 study by Sharan and Ajeesh suggested that

extended use of a mobile phone could be harmful to the musculoskeletal system of the hand. The physical exposures linked to smartphone use include neck flexion, shoulder flexion and abduction, elbow flexion, wrist and finger flexion, and repeated thumb movements. Cell phone users may have discomfort in their neck, shoulder, elbow, and hand due to repetitive neck bending and inappropriate use of their hand and shoulder muscles. Upper back pain may result from using a smartphone for an extended amount of time. Upper limb musculoskeletal pain (Bonney & Corlett, 2002 & Sharan et al., 2014). Ahmed et al. (2021) reported hand, shoulder, and neck discomfort, and Ahmed et al. (2019) reported musculoskeletal pain in these regions.

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