

# “Evaluation Of Hand Grip Strength And Upper Limb Disability In Smartphone Addicted Physiotherapy Students Age Between 18 To 24”

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## Abstract

**Background:** In today's world, there are number of students who use phone for longer periods smartphone provides us lot of amazing features there on other hand widespread use has negative outcomes on physical and mental health. Its extensive use can be associated with musculoskeletal complication that is pain in neck and hand after continuous usage of many hours. Smartphone addiction can lead to a sedentary life style, with individuals spending long hours using their phones instead of engaging in physical activities. Lack of exercise can contribute to overall muscles weakness, which can exacerbate hand and shoulder problem. The study is important to identify the risk factors of smartphone addiction student, their hand grip strength and neck disability among undergraduate physiotherapy student, as it affects their health and as well as their academic achievements. The aim and objective of this study is to determine the hand grip strength and Upper limb disability in smartphone addicted students by using hand held dynamometer, DASH questionnaire, SAS-SV Scale.

**Method:** This is a cross sectional study which was conducted in a physiotherapy college in Maharashtra. The total duration of study was 6 months. Data was collected from 50 undergraduate physiotherapy students from first year to final year by using SAS-SV scale, Quick DASH questionnaire, and Dynamometer. Quick DASH questionnaire was given to students to assess the multiple musculoskeletal problems in their upper extremities. SAS-SV was given to asses smartphone addiction level. Dynamometer was used to assess hand grip strength.

**Conclusion:** This study concluded that increasing in smartphone addiction decreases the hand grip strength and increases upper limb disability. Upper limb disability was found mild to moderate level.

**Key Words:** Smartphone addicted student, dynamometer, DASH questionnaire, SAS-SV Scale.

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## I. INTRODUCTION

Nowadays, electronic gadgets play an important role in students' life. Modern technological development has made living simpler today we can quickly call or video chat with any one at any time by moving our fingers when using a smartphone<sup>1</sup>. People not using smartphone for communication but they can play game of their own choices<sup>2</sup>.

Where on one hand it provides us lot of amazing features there on other hand widespread use has negative outcomes on physical and mental health. Its extensive use can be associated with musculoskeletal complication that is pain in neck and hand after continuous usage of many hours<sup>[5]</sup>

It would be better to say that it has become an essential part of life. It is portable and accessible device that makes it possible to use it anywhere at any time<sup>[4]</sup>. It is said by youngster that they cannot exist without smart phone as it has become a part of their life. Many studies have reported that adolescents spend approximately 10 hours on social media daily.<sup>[5]</sup>

The phone use has been increased in recent year and it can cause many diseases of hand like carpel tunnel syndrome. Overuse of smart phone can cause pain and numbness in thumb and decreasing hand function and pinch strength. <sup>[10]</sup> Complications and adverse effect of smartphone excessive usage may include dry eyes, computer vision problem, neck and shoulder problem, De Quervain's tenosynovitis and weakness of thumb and wrist.

Excessive smartphone use reduces an individual's social implication in the real world and, as a consequence, his or her psychological well-being because it produces the kind of isolation, loneliness, and depression the individual seeks to ease by connecting to the Internet. Therefore, heavy smartphone users meet with their friends less often in person. the excessive user group experienced difficulty in expressing emotions than the comparison group did. Furthermore, the excessive user group had a higher level of interpersonal anxiety than the comparison group.

## II. Material and Method

The study is cross sectional study was conducted among physiotherapy students at college of physiotherapy in Maharashtra. The sample size estimated for this study is 50. The duration of study was 6 months from September 2023 to march 2024 the technique used in this study was conventional sampling technique. The sample was calculated by utilizing the standard formula:

$$n = \frac{\left[ z_{1-\beta} + z_{1-\frac{\alpha}{2}} \right]^2}{\left[ \frac{r^2}{1-r^2} \right]}$$

Where,

R: Correlation coefficient.

$z_{1-\alpha/2}$  : Desired confidence level

1- $\beta$ : Power

The inclusion criteria for this study undergraduate physiotherapy students from first year to final year and students who use phone more than 4 hours and the student who gave consent. The student who did not give consent was excluded from study

The students having no history of smart phone use were exclude from study and students having fracture in upper extremity.

## III. RESULTS AND DISSCUSSION

The study which was undertaken for evaluation of hand grip strength and upper limb disability in smartphone addicted undergraduate physiotherapy students has yield the following results. A total of 50 undergraduate physiotherapy students participated in the study. The age of the subjects ranged from 18 years to 24 years.

Age wise distribution of study student between 18 to 19 number of student 7 and their percentage 14.0, 20 to 21 no. of students 24 percentage 48.0, 22 to 24 students 19 percentage 38.0, total no. of students 50 = 100% (table1)

Gender wise distribution of study subjects total no. of male 10=20.0%, total no. of female 40=80.0%(table2)

Severity of quick dash score 33 no. of students having normal dash score =66%, 17 no. of students having mild quick dash score = 34.0%(table3)

Severity of hand dynamometer right hand normal 1, weak 47 strong 2 students. Severity of hand dynamometer left side normal 1, weak 43, strong 5. (table4)

The survey response rate 100 %. Mean age of participants was 21.08+\_1.38(18 -24) years. Correlation of SAS-SV with quick dash score p value 0.4343, ns correlation of SAS-SV with dynamometer right p value 0.2277, ns correlation of SAS-SV with dynamometer left p value 0.8037, ns

In the present study ,50 subject were taken in which 10 are males and 40 are females. The age of subjects varies from 18 to 24. The subjects from first year to fourth year of undergraduate physiotherapy students were taken. Quick DASH questionnaire was given to students to assess the multiple musculoskeletal problems in their upper extremities. SAS-SV is given to asses smartphone addiction level. dynamometer helps to assess hand grip strength.

Our result indicates increase in smartphone addiction decreases hang grip strength and increase in upper limb disability. We found earlier in the article “The relationship between smartphone usage duration (using smartphone ability to monitor screen time) with hand grip and pinch grip strength among young people: an observational study.”

The use of smartphone has become widely popular among young people for multiple purpose other than communication. This weakness occurs due to repetitive flexion and extension of wrist, thumb, and finger leading to significant pathology. We found in earlier study in the article “prevalence of text neck syndrome and SMS thumb among smartphone users in college going students: cross-sectional survey study.”

In 21<sup>st</sup> century technology plays an important role in human life. The phone use has been increased in recent year and it can cause many diseases of hand like carpel tunnel syndrome. Overuse of smart phone can cause pain and numbness in thumb and decreasing hand function and pinch strength. Complications and adverse effect of smartphone excessive usage may include dry eyes, computer vision problem, neck and shoulder problem, De Quervain’s tenosynovitis and weakness of thumb and wrist.

The Study On “**Evaluation Of Hand Grip Strength And Upper Limb Disability In Smartphone Addicted University Students Age Between 18 To 24**”. The Result Shows That It Was Supporting Aim Which

Was Evaluation Of Hand Grip Strength And Upper Limb Disability In Smartphone Addicted Physiotherapy Student By Using Quick Dash, Sas-Sv, Dynamometer.

The study shows that there is increasing smartphone addiction decreases hand grip strength and increase in upper limb disability. This study similar to other studies conducted earlier in other countries.

#### IV. CONCLUSION

This study concluded that there is high level of smartphone addiction among young adults. This study concluded that there is increase level of smartphone addiction decreases hand grip strength and increase in upper limb disability. upper limb disability was found mild level to moderate level. It was found that there is negative correlation between smartphone overuse and hand grip strength in young adult. It was found that their positive correlation between smartphone addiction and upper limb disability.

**Table No.1**  
**Age distribution of study subjects.**

Age in years	No. of subjects	Percentage
18 – 19	7	14.0
20 – 21	24	48.0
22 – 24	19	38.0
Total	50	100
Mean Age $\pm$ SD (Range)	21.08 $\pm$ 1.38 (18 – 24)	

**Table No.2**  
**Gender wise distribution of study subjects.**

Gender	No. of subjects	Percentage
Male	10	20.0
Female	40	80.0

**Table No.3**  
**Severity of Quick dash score**

Quick dash score	No. of subjects	Percentage
Normal	33	66.0
Mild	17	34.0

**Table No.4**  
**Severity of Hand dynamometer**

Hand Dynamometer		No. of subjects	Percentage
Right	Normal	1	2.0
	Weak	47	94.0
	Strong	2	4.0
Left	Normal	1	2.0
	Weak	43	86.0
	Strong	5	10.0

**Table No.5**  
**Comparison of quick dash score between male and Female.**

Gender	Mean	SD	t-value	p-value
Male	14.2	11.49	0.8249	0.4110,NS
Female	17.22	10.02		

**Table No.6**  
**Comparison of SAS-SV between male and Female.**

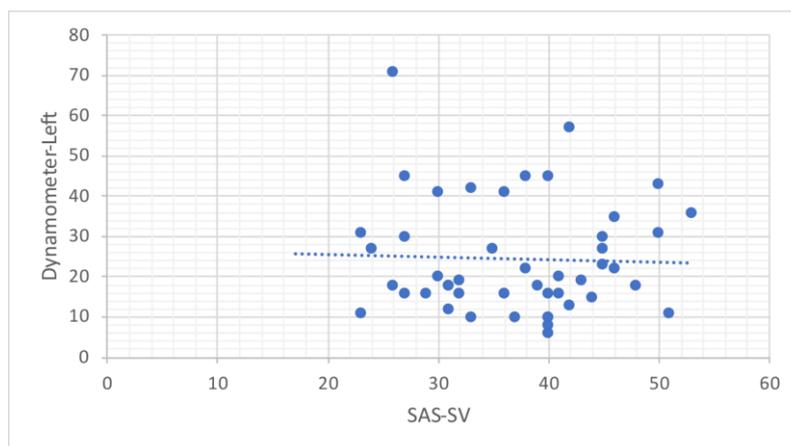
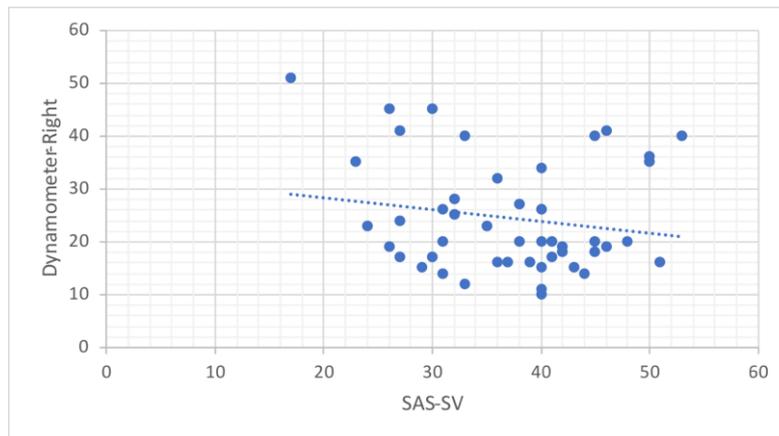
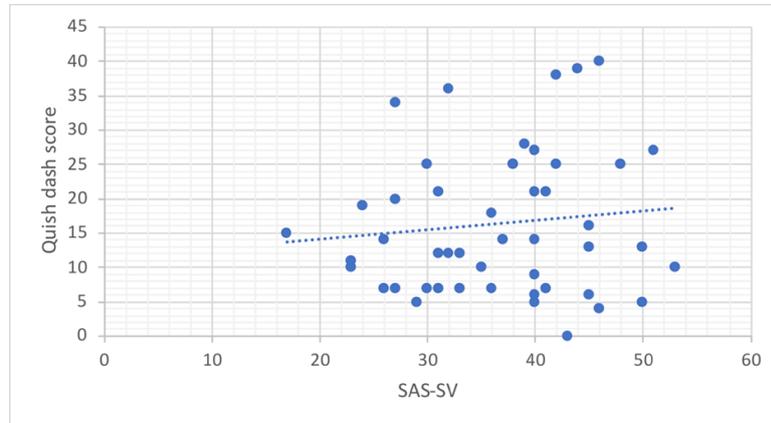
Gender	Mean	SD	t-value	p-value
Male	40.4	9.94	1.5490	0.1281,NS
Female	35.87	7.79		

**Table No.7**  
**Comparison of Dynamometer score between male and Female.**

	Gender	Mean	SD	t-value	p-value
Right	Male	37.0	5.51	5.3471	<0.0001,HS
	Female	21.23	8.83		
Left	Male	39.5	13.84	4.5668	<0.0001,HS
	Female	20.43	11.11		

**Table No.8**  
**Correlation of SAS-SV with Quick dash score and Dynamometer score.**

	Quick dash score		Dynamometer- Right		Dynamometer- Left	
	r-value	p-value	r-value	p-value	r-value	p-value
SAS-SV	0.1143	0.4343,NS	-0.1774	0.2277,NS	-0.0373	0.8037,NS



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