



## SMARTPHONE USAGE AMONG COLLEGE STUDENTS BEFORE AND DURING COVID 19 LOCKDOWN

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Received : 12 July 2022; Revised : 17 August 2022;  
Accepted : 25 August 2022; Published : 27 December 2022

**Abstract:** Today parents' wants to protect their wards from mobile phone addiction but use of mobile phone is necessary to continue virtual leaning during COVID 19 lockdown. Thus, in view the sensitivity of college students towards smart phones, this study has been conducted to test the significance of difference of time spent on mobile phone, social media apps and e-learning before and during COVID 19 lockdown by the college students. Despite its efforts have been made to examine the mobile phone usage pattern among college students. This study is primary data based. Chi square test has been used to test the significance of relationship between variables and paired t-test has been used to test the significance of difference between means. The results of the study reveals that during lockdown period college students have spent significantly more average time on mobile phone due to e-learning and use of social networking apps. **Key words:** Smartphone , Covid-19, Virtual learning, Social networking apps,

### INTRODUCTION

Our dependency on mobile phone is increasing day by day. COVID 19 lock down has also promoted the use of mobile phones among people in general and students in particular. To encourage virtual learning among students during COVID 19 lock down govt. has directed teaching faculty to use social media platforms i.e. whatsapp, you tube, Google meet and e-mails etc. regularly. Despite, importance in communication, smart phones are criticised for their misuse and side effects. Today use of smartphone for non-calling purposes such as accessing social networking sites, Google search, watching movies on entertainment apps and chatting is dominating among people. Our dependency on mobile phone is increasing day by day.

#### To cite this article:

Basu Garg (2022). Smartphone Usage among College Students before and during Covid 19 Lockdown. *Indian Journal of Applied Business and Economic Research*, Vol. 3, No. 2, pp. 239-258. [https://DOI: 10.47509/IJABER.2022.v03i02.03](https://DOI:10.47509/IJABER.2022.v03i02.03)

Market studies reveal that on an average every day people engage with their mobile phone for two to three hours. This addiction is more alarming among youngster where smart phones have become vital part of their lives. Smartphone is an enlarged version of mobile/cell phone which can function like a computer. It is capable to browse internet and run software like a computer. Smartphone provide more feature to its customers than ordinary cell phones that only allow its user to make phone call and send text message. In 21<sup>st</sup> century the emergence of ICT and internet facilities have influenced teaching and learning dramatically. Today mobile phone has become an integral part of human life, perhaps human being move anywhere without its mobile phone. According to (Sandhya Keelery, [www.statista.com](http://www.statista.com)) India's digital journey is one of exuberance. The country had the world's second-largest internet population at over 483 million users in 2018. Of these, 390 million users accessed the internet via their mobile phones. Estimates suggest that this figure would reach over 500 million by 2023. Moreover, according to (Statista Research Department) India, the second most populous country in the world is projected to pass the United States in number of smartphone users. The number of smartphone users in India was estimated to reach over 760 million in 2021.

## **REVIEW OF LITERATURE**

Mobile phones became a very important element of well-developed societies. It is not only a device, but also a "smart" part of our life. Very often this device support people with the answers to the various questions, like: opening hours, weather forecast, news, sport games results, clues, etc. (Grzegorz and Fabisiak, 2018). Majority of the college students are using the smart phones and most of the students prefer prepaid card over post paid card (Vaidya, Pathak and Vaidya, 2016). Smartphones have negative effects on students' academic performance even though they were used for school-related learning activities. So, there is a need to evaluate and better understand smartphone use among tertiary students. Generally, when students use smartphone for learning activities, information is essentially transmitted one way as there is no direct teaching involved (Siew Foen Ng, Nor Syamimi etc. 2017). Due to knowledge of health hazards involved with smartphone, users should restrain from excessive usage and apply due precautions to get rid of negative effects on users health (Subramanian and Sindhuja 2017). Noah Darko-Adjei (2019), found mixed effect (positive as well as negative) of the use of smartphone in the students learning activities. Simon Amez and Stijn Baert (2020) analysed the literature and revealed predominance of empirical results supporting a negative association between students' frequency of smartphone use and their academic success.

Almost all of the students have started to use smart phone when enter into college. Smart phones also affect studies and relationships. Physical health of smart phone users also affected because of its long use (Monika, Malik, and Yadav 2020). Chan Yuen Fook, Suthagar Narasuman etc. (2021), observed that almost half of the students spent three to six hours a day on their smartphone. On an average, majority of students spent 30 to 44 minutes a day and more than 40 hours a week on their smartphone. The results showed the students were somewhat addicted to their smartphone. Most of the time, they were surfing the internet and the main factor to trigger them to use their phone was their mood.

### **RATIONALE OF THE STUDY**

Today mobile addiction has become a major concern among students. Students spend lot of time on their mobile phones to access social networking sites, Google search and chatting with their friends. This all distract students from their study and result wastage of their effective learning time. On the other hand to encourage virtual teaching and learning during COVID 19 lock down govt. has directed teaching faculty to use social media platforms i.e. whatsapp, you tube, Google meet and e-mails regularly. Moreover, during this period primary social networking apps have played important role in e-learning. These apps have been proved an important aid to keep oneself away from anxiety and isolation and continue academic study during lock down. Govt. of India has also initiated a campaign '**Bharat Padhe Online**' for inviting suggestions and sharing ideas from teachers and students to encourage e-learning. Despite it, from review of literature it has been found that none study has been conducted regarding the use of smartphone among college students during COVID 19 lock down and there is a research gap. So keeping in view mobile addiction among students on one hand and govt. emphasis on e-learning during COVID 19 lock down, the present study is an attempt to examine pattern of smartphone usage among college students before and during COVID 19 lockdown.

### **HYPOTHESIS**

The present study analysis the smartphone usage among college students before and during COVID 19 lockdown and attempts to check the validity of objectives with the following hypothesis:

- Ho1:** There is no significance association between stream of college students and time spent on mobile phone use before COVID 19 lock down
- Ho2:** There is no significance association between stream of college students and time spent on mobile phone use during COVID 19 lock down

- Ho3:** There is no significance association between stream of college students and time spent on mobile phone for academic study before COVID 19 lock down
- Ho4:** There is no significance association between stream of college students and time spent on mobile phone for academic study during COVID 19 lock down
- Ho5:** There is no significance association between academic level of college students and time spent on mobile phone use before COVID 19 lock down
- Ho6:** There is no significance association between academic level of college students and time spent on mobile phone use during COVID 19 lock down
- Ho7:** There is no significance association between academic level of college students and time spent on mobile phone for academic study before COVID 19 lock down
- Ho8:** There is no significance association between academic level of college students and time spent on mobile phone for academic study during COVID 19 lock down
- Ho9:** There is no significance association between gender of college students and time spent on mobile phone use before COVID 19 lock down
- Ho10:** There is no significance association between gender of college students and time spent on mobile phone use during COVID 19 lock down
- Ho11:** There is no significance association between gender of college students and time spent on mobile phone for academic study during COVID 19 lock down
- Ho12:** There is no significance association between gender of college students and time spent on mobile phone for academic study during COVID 19 lock down
- H013:** Difference between mean values is zero.

### **OBJECTIVES OF THE STUDY**

The main aim of the present study is to test the significance of difference of time spent on mobile phone, social media apps and e-learning before and during COVID 19 lockdown by the college students. Despites, it attempts to analyze that 1. Which factors govern the choice of mobile phone among college students? 2. Which social networking apps are popular among college students and 3. How much time college students have spent on

mobile phone, social net working sites and e-learning before and during COVID 19 lockdown?

## **METHODOLOGY**

The present study was descriptive in nature as it attempted to analyze the pattern of smartphone usage among college students before and during COVID 19 lockdown. This study was confined to district Bilaspur of Himachal Pradesh in India. To collect desired data for study to answer the research questions and test hypothesis a Web-based survey was conducted. Descriptive statistics were used to summarize demographic data and survey results. Moreover, only primary social networking apps were included in the study to examine preference of college students for social media apps. Response of college students was sought using dichotomous questions, multiple choice questions and using 5 point Likert scale. In this scale one was equal to “strongly disagree;” and five was equal to “strongly agree.” SPSS was used to analyze and compute different statistics. Further data has been analysed with the help of percentage, t-test and chi-square test of independence and goodness of fit to answer the research questions.

## **SAMPLING PLAN**

Convenience cum snowball sampling has been adopted to collect desired information from the respondents using Web survey. During COVID 19 lock down at college level subject wise different groups of students were already framed by the respective colleges on the direction of Director of higher education. Therefore, web survey was conducted to collect desired information from the students during COVID 19 lockdown. Population of present study comprises of all students (UG and PG) of different streams (arts, commerce, science and vocational) who are studying in different govt. colleges of district Bilaspur of Himachal Pradesh in India. This survey was conducted during the month June-July, 2021. Total responses of 708 students were obtained and out of them 692 questionnaires were considered for further analysis. A detail of sampling plan is given as below:

- **Population:** All students of Govt. colleges in district bilaspur of Himachal Pradesh in India
- **Sampling frame:** Students’ college attendance registers and subject wise groups
- **Sampling unit:** Boys and girls students (UG and PG) who were studying govt. colleges of district Bilaspur of Himachal Pradesh in India
- **Sample size:** 692

- **Nature of study:** Descriptive
- **Nature of survey:** Web survey
- **Instrument used:** Structured questionnaire in Google form

## ANALYSIS AND RESULT

### DEMOGRAPHIC PROFILE

Demography of the respondents has influence on their behaviour. Thus, in the present study students of different demographical characteristics (gender, age, parental income, stream and educational level) were included to obtain desired information. The demographic characteristics of the respondents whose opinion were considered in the survey have been summarised in table 1.

**Table 1: Demographic characteristic of the respondents**

<i>S. No</i>	<i>Demographic variable</i>	<i>No. of respondents</i>	<i>Percentage</i>
1	Age (years)		
	17-19	450	65
	20-22	233	33.7
	23-25	09	1.3
	26 and Above	—	—
	<b>Total</b>	<b>692</b>	<b>100</b>
2	Gender		
	Male	255	36.8
	Female	437	63.2
	<b>Total</b>	<b>692</b>	<b>100</b>
3	Residential Location		
	Rural	597	86.3
	Urban	55	7.9
	Semi urban	40	5.8
	<b>Total</b>	<b>692</b>	<b>100</b>
4	Level of study		
	UG	555	80.2
	PG	137	19.8
	<b>Total</b>	<b>692</b>	<b>100</b>
5	Domain of study		
	Arts	225	32.5
	Commerce	171	24.7
	Science	268	38.7
	Vocational	28	4.1
	<b>Total</b>	<b>692</b>	<b>100</b>

*contd. table 1*

S. No	Demographic variable	No. of respondents	Percentage
6	Parent's income (Monthly in Rs.)		
	Below 10000	357	51.7
	Between 10000-20000	137	19.8
	Between 20000-30000	72	10.4
	Between 30000-40000	55	8
	Between 40000-50000	33	4.8
	50000 and above	37	5.4
	<b>Total</b>	<b>692</b>	<b>100</b>

Source: Data compiled through web survey using structured questionnaire

### **PATTERN OF SMARTPHONE USAGE**

Classification of college students on the basis of brand of smartphone is presented in Table 2. From the table it is clear that there is no clear cut majority about brand of smartphone among college students. Nevertheless, Redmi, Realme and Vivo brand are comparatively more popular brand of smartphone among college students.

**Table 2: Classification of respondents on the basis of brand of Smartphone**

Name of company	No. of respondents	Percentage
Samsung	54	7.8
Vivo	107	15.5
Realme	112	16.2
Redmi	210	30.3
Xiaomi	28	4.0
Micromax	9	1.3
Lava	14	2.0
Intex	4	0.6
Oppo	59	8.5
Other	95	13.7
Total	692	100

Source: Data compiled through web survey using structured questionnaire

In table 3 an attempt has been made to identify factors which influence college students' choice for a smartphone. For this purpose different factors have been grouped into three broad categories i.e. economic seeker, value seeker and prestige seeker. From the table it is evident that 54.9% respondents are value seeker. They give importance to different mobile features (viz. camera, memory, battery life etc.) while purchase a smartphone. On the other hand 30.3% college students give importance to price of the smartphone. There are only 5.8% college students who give preference to brand image

and shape of smartphone. Thus, it is concluded that more than half college students are value seeker and features of smartphone influence their choice while purchase a smartphone. While approximately one-third college students give more weight age to price of the smartphone.

**Table 3: Classification of respondents on the basis of factor affecting choice of smartphone**

<i>Factor</i>	<i>No. of respondents</i>	<i>Percentage</i>
Economic seeker (Price)	272	30.3
Value seeker (camera, memory, battery life etc.)	380	54.9
Prestige seeker (brand image, shape and size)	40	5.8
Total	692	100

*Source:* Data compiled through web survey using structured questionnaire

In Table 4 to 4(b) efforts have been made to examine the relationship between average time spend on smartphone before and during COVID 19 lockdown by the college students. It is observed from the table and diagram that during COVID 19 lockdown average time spends on smartphone has increased significantly. Before COVID 19 lockdown majority of college students spend up to three hours on their smartphone (which also includes students who spend less than one hour and 1-2 hours), but during COVID 19 lockdown they have spent more time on their mobile phone than earlier. Earlier there were 11%, 3.3% and 3.5% college students who had spent 3-4, 4-5 and more than 5 hours respectively on their smartphone, but during COVID 19 lock down this percentage has increased to 15.3%, 12.6% and 13.6% respectively. The same phenomena can also be understood from the diagram where red rectangles (which shows time spend during COVID 19 lockdown on mobile phone) are higher when response towards time spend on mobile phone is increasing.

**Table 4: Classification of respondents on the basis of time spend on mobile phone**

<i>Average Time (in hours)</i>	<i>Before COVID 19 lockdown</i>	<i>During COVID 19 Lockdown</i>
Less than one hour	137 (19.8)	71 (10.3)
1-2	262 (37.9)	144 (20.8)
2-3	170 (24.6)	190 (27.5)
3-4	76 (11)	106 (15.3)
4-5	23 (3.3)	87 (12.6)
5 and above	24 (3.5)	94 (13.6)
Total	692 (100)	692 (100)

*Source:* Data compiled through web survey using structured questionnaire

Figures in parenthesis indicate percentage



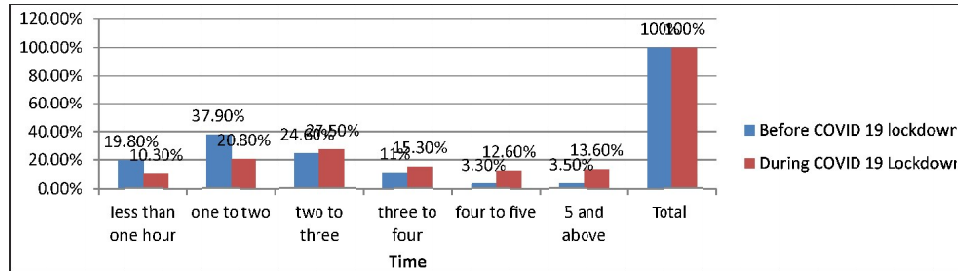


Fig. 1

In table 5 and 5(a) efforts have been made to understand the popularity of primary social networking mobile phone apps among college students. It is noticed from the table that 75.9% college students use whatsapp and 52.8% college students' use you tube. Instagram is used by 33.6% college students. On the other hand face book and twitter are used by 19% and 7.7% college students respectively. Therefore, on the basis of above analysis it can be summed up that whatsapp and you tube are much popular among college students whereas face book and twitter are less popular among college students. This phenomenon is equally true before and after COVID 19 Lockdown with slight variation.

**Table 5: Classification of respondents on the basis of primary social media mobile phone apps**

Social networking apps	No. of respondents	Percentage
Face book	131	19
Whatsapp	524	75.9
Twitter	53	7.7
You tube	364	52.8
Instagram	232	33.6
Other	81	11.7
Total	692	100

Source: Data compiled through web survey using structured questionnaire

Table 6 and diagram shows the relationships between times spend on mobile phone by the college students for academic purpose. From the data it is observed that during COVID 19 lockdown time spend on mobile phone for academic purpose has also increased significantly. There were 7.1% college students who were not use mobile phone for academic study before COVID 19 lockdown but during COVID 19 lock down this percentage declined to 3.5%. Like this there were 19.1%, 7.1%, 3.9% and 2.3% college students who were spent 2-3, 3-4, and 4-5 and above 5 hours respectively on mobile phone for academic purpose before COVID 19 lock down but

Table 5(a): Classification of respondents on the basis of time spend on different primary social media apps

Duration	Social networking apps	Not use	Less than one hour	Time					Total
				1-2 hours	2-3 hours	3-4 hours	4-5 hours	More than 5 hours	
<b>Before COVID 19 lockdown</b>	Face book	439(63.4)	201 (29)	37 (5.3)	9 (1.3)	3 (0.4)	3 (0.4)	3 (0.4)	692 (100)
	Whatsapp	40 (5.8)	395 (57.1)	177 (25.6)	39 (5.6)	21 (3)	10 (1.4)	10 (1.4)	692 (100)
	Twitter	608 (87.9)	65 (9.4)	12 (1.7)	4 (0.6)	1 (0.1)	1 (0.1)	1 (0.1)	692 (100)
	You tube	66 (9.5)	299 (43.2)	234 (33.8)	58 (8.4)	22 (3.2)	7 (1)	6 (0.9)	692 (100)
	Instagram	443(64)	220 (31.8)	24 (3.4)	2 (0.2)	1 (0.1)	1 (0.1)	1 (0.1)	692 (100)
<b>During COVID 19 lock down</b>	Other	243 (35.1)	264 (38.2)	127 (18.4)	34 (4.9)	14 (2)	5 (0.7)	5 (0.7)	692 (100)
	Face book	423 (61.1)	181 (26.2)	59 (8.5)	23 (3.3)	4 (0.6)	1 (0.1)	1 (0.1)	692 (100)
	Whatsapp	24 (3.5)	306 (44.2)	209 (30.2)	92 (13.3)	29 (4.2)	15 (2.2)	17 (2.5)	692 (100)
	Twitter	585 (84.5)	73 (10.5)	22 (3.2)	5 (0.7)	3 (0.4)	2 (0.3)	2 (0.3)	692 (100)
	You tube	64 (9.2)	233 (33.7)	223 (32.2)	107 (15.5)	44 (6.4)	13 (1.9)	8 (1.2)	692 (100)
Instagram		259 (37.4)	227 (32.8)	124 (17.9)	46 (6.6)	17 (2.5)	8 (1.2)	11 (1.6)	692 (100)
	Other	253 (36.6)	257 (37.1)	115 (16.6)	39 (5.6)	12 (1.7)	6 (0.9)	10 (1.4)	692 (100)

Source: Data compiled through web survey using structured questionnaire

Figures in parenthesis indicate percentage

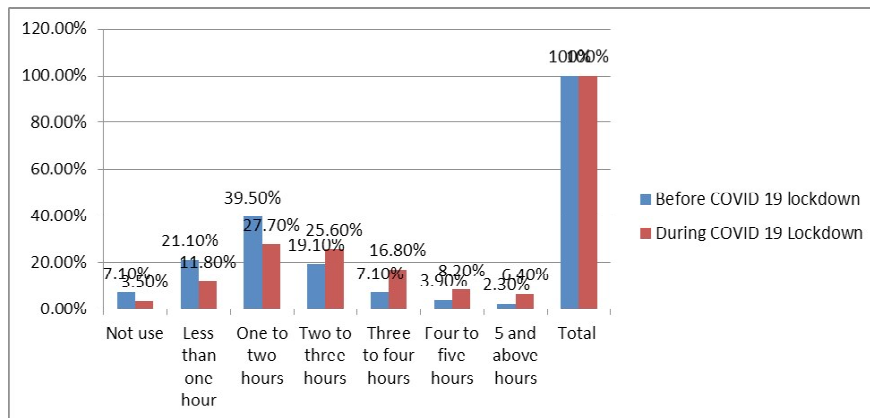
during COVID 19 lockdown these percentages increase to 25.6, 16.8, 8.2 and 6.4 respectively. Therefore, it is concluded that during COVID 19 lockdown average time spend on mobile phone for academic purpose by the college students has increased significantly.

**Table 6: Classification of respondents on the basis of time spend on mobile phone for academic study**

Time (in hours)	Before COVID 19 lockdown	During COVID 19 Lockdown
Not use	49 (7.1)	24 (3.5)
Less than one hour	146 (21.1)	82 (11.8)
1-2	273 (39.5)	192 (27.7)
2-3	132 (19.1)	177 (25.6)
3-4	49 (7.1)	116 (16.8)
4-5	27 (3.9)	57 (8.2)
5 and above	16 (2.3)	44 (6.4)
Total		

Source: Data compiled through web survey using structured questionnaire

Figures in parenthesis indicate percentage



**Figure 2**

In table 7 efforts have been made to analyse the opinion of college students towards use of mobile phone. For this purpose some statements representing positive and negative aspect of use of mobile phone were included and response was sought at five point Likert Scale. From the table it is clear that majority of college students are agree that overall effect of mobile phone on academic study is positive and use of mobile phone for academic purpose is not only important during lockdown periods but it is equally use full all the time. Further most of the students confess that mobile

Table 7: Opinion of college students towards use of Smartphone

S.No.	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total	Mean	SD	SK	Chi-Square
1	Mobile phone is very useful for academic study during lockdown period	101 (14.6)	290 (41.9)	181 (26.2)	82 (11.8)	38 (5.5)	692 (100)	3.48	1.05	-0.59	P<0.05
2	Mobile phone is always very useful for academic study	77 (11.2)	311 (45.2)	185 (26.9)	89 (12.9)	26 (3.8)	692 (100)	3.47	0.98	-0.58	P<0.05
3	Mobile phone distract students from their study	47 (6.8)	261 (37.7)	221 (31.9)	134 (19.4)	29 (4.2)	692 (100)	3.23	0.98	-0.31	P<0.05
4	Mobile phone motivate students to learn new things in new ways	103 (14.9)	420 (60.9)	131 (18.9)	26 (3.8)	12 (1.7)	692 (100)	3.83	0.79	-1.02	P<0.05
5	Overall impact of mobile phone on academic study is positive	43 (6.2)	301 (43.5)	239 (34.5)	89 (12.9)	20 (2.9)	692 (100)	3.37	0.89	-0.51	P<0.05
6	Overall impact of mobile phone on academic study is negative	22 (3.2)	145 (21)	228 (32.9)	264 (38.2)	33 (4.8)	692 (100)	2.79	0.93	0.29	P<0.05

Source: Data compiled through web survey using structured questionnaire

Figures in parenthesis indicate percentage

phone motivate them to learn new things in new ways. In this regard mean value is above three on five point likert scale. It shows that most of the college students are agree or strongly agree with these statements. Standard deviation was found low and skewness was negative. It reveals that opinion of college students towards these statements is skewed to upper end i.e. agree or strongly agree. Significant values of Chi-square test at 5% level of significance reveal that opinion of college students about these statements is not equally distributed. Unlike this majority of college are disagree that mobile phone has negative effect on academic study. Mean value less than three indicate that college students are either neutral or disagree with this statement. Standard deviation is low and skewness is positive. It shows that opinion of college students toward negative impact of mobile phone on academic study is distributed towards lower side i.e. disagree and strongly disagree. Chi- square test value is significant at 5% level of significance. It means opinion of college students about this issue is not equally distributed. Thus, on the basis of above analysis it is concluded that despite the fact that mobile phone distract college students from the study majority of college students are agree that overall effect of mobile phone on their academic study is positive and mobile phone motivate them to learn new things in new ways.

Further the application of t-test reveals that there is significant difference between mean values of time spent on mobile phone and selected primary social media apps by college students before and during COVID 19 lock down. Since t value is significant at 5% level of significance in all cases except other social media apps. Thus, it is concluded that mean values of time spent on mobile phone and selected social media apps during covid 19 lock down are significantly higher than their respective mean values of time spent before covid 19 lock down (table 8 and 8a).

## **RESULT OF THE STUDY**

After analysing the collected data following findings have been extracted:

1. It is observed from the study that there is no clear cut majority among college students regarding brand of mobile phone. However, Redmi (30.3%), Realme (16.2%) and Vivo (15.5%) brand are comparatively more popular among college students.
2. From the study it is concluded that more than half college students are value seeker (54.9) and features of smartphone influence their choice while purchase a smartphone. While approximately one-third (30.3%) college students give more weight age to price of the smartphone while purchase a mobile phone.

Table 8: (Paired Samples Statistics)

Pair	Duration	Mean	N	Std. Deviation	Std. Error Mean
Pair I	Time spent on mobile phone	2.506	692	1.2179	.0463
	Before covid 19 lock down				
	During covid 19 lock down	3.399	692	1.5302	.0582
Pair II	Time spent on mobile phone for study purpose	2.189	692	1.286	.048
	Before covid 19 lock down				
	During covid 19 lock down	2.905	692	1.458	.055
Pair III	Time spent on Face book	.480	692	.7858	.0299
	Before covid 19 lock down				
	During covid 19 lock down	.571	692	.8704	.0331
Pair IV	Time spent on whatsapp	1.532	692	1.0599	.0403
	Before covid 19 lock down				
	During covid 19 lock down	1.868	692	1.2060	.0458
Pair V	Time spent on twitter	.168	692	.5467	.0208
	Before covid 19 lock down				
	During covid 19 lock down	.240	692	.6975	.0265
Pair VI	Time spent on you tube	1.590	692	1.0428	.0396
	Before covid 19 lock down				
	During covid 19 lock down	1.863	692	1.2054	.0458
Pair VII	Time spent on other social media apps	1.056	692	1.0991	.0418
	Before covid 19 lock down				
	During covid 19 lock down	1.072	692	1.1875	.0451

Table 8 (a): Test of significance of difference between means

Pair	Time spent on mobile phone	Mean	Standard deviation	Standard error	95% confidence interval of the difference		t	df	Sig (2 tailed)
					lower	upper			
I. Time spent on mobile phone	Before and during COVID 19 lock down	-.893	1.385	0.0527	-0.996	-0.789	-16.95	691	.000
II. Time spent on mobile phone for study purpose	Before and during COVID 19 lock down	-.715	1.381	.0525	-.818	-.612	-13.62	691	.000
III. Time spent on Face book	Before and during COVID 19 lock down	-.0910	.6625	.0252	-.1405	-.0416	-3.615	691	.000
IV Time spent on whatsapp	Before and during COVID 19 lock down	-.3367	1.0197	.0388	-.4128	-.2606	-8.686	691	.000
V Time spent on twitter	Before and during COVID 19 lock down	-.0723	.5465	.0208	-.1130	-.0315	-3.478	691	.001
VI Time spent on YouTube	Before and during COVID 19 lock down	-.2731	.9437	.0359	-.3436	-.2027	-7.613	691	.000
VII Time spent on other social media apps	Before and during COVID 19 lock down	-.0159	1.0396	.0395	-.0935	.0617	-.402	691	.688

**Table 9: Summary of Hypothesis Testing**

<i>S. No.</i>	<i>Null hypothesis</i>	<i>P Value</i>	<i>LOS</i>	<i>Remark</i>
1	There is no significance association between stream of college students and time spent on mobile phone use before COVID 19 lock down	0.663535	0.05	Accepted
2	There is no significance association between stream of college students and time spent on mobile phone use during COVID 19 lock down	0.0261256	0.05	Rejected
3	There is no significance association between stream of college students and time spent on mobile phone for academic study before COVID 19 lock down	0.469236	0.05	Accepted
4	There is no significance association between stream of college students and time spent on mobile phone for academic study during COVID 19 lock down	0.162021	0.05	Accepted
5	There is no significance association between academic level of college students and time spent on mobile phone use before COVID 19 lock down	0.914811	0.05	Accepted
6	There is no significance association between academic level of college students and time spent on mobile phone use during COVID 19 lock down	0.068698	0.05	Accepted
7	There is no significance association between academic level of college students and time spent on mobile phone for academic study before COVID 19 lock down	0.83113	0.05	Accepted
8	There is no significance association between academic level of college students and time spent on mobile phone for academic study during COVID 19 lock down	0.774956	0.05	Accepted
9	There is no significance association between gender of college students and time spent on mobile phone use before COVID 19 lock down	0.0171362	0.05	Rejected
10	There is no significance association between gender of college students and time spent on mobile phone use during COVID 19 lock down	0.747634	0.05	Accepted
11	There is no significance association between gender of college students and time spent on mobile phone for academic study during COVID 19 lock down	0.0547022	0.05	Accepted
12	There is no significance association between gender of college students and time spent on mobile phone for academic study during COVID 19 lock down	0.0140544	0.05	Rejected



3. From the study it is summed up that whatsapp (75.9%) and you tube (52.8%) are popular primary social networking mobile apps among college students whereas, face book (19%) and twitter (7.7%) are less popular mobile apps among college students. This phenomenon is equally true before and after COVID 19 lockdown with slight variation.
4. It is observed from the study that during COVID 19 lockdown average time spends on smartphone has increased significantly. Before COVID 19 lockdown majority of college students spend up to three hours on their smartphone (it also includes students who spend less than one hour and between 1-2 hours), but during COVID 19 lockdown they have spent more time on their mobile phone than earlier. Further it is concluded that average time spend on mobile phone for academic purpose by the college students has also been increased significantly.
5. There is significant association between stream of college students (i.e. science, commerce, arts and vocational) and time spent on mobile phone use (I.e. less than one hour, 1-2, 2-3, 3-4, 4-5 and more than 5 hours) during COVID 19 lock down. It shows that college students of all streams didn't spend time equal time on mobile phone use during COVID 19 lockdown. Majority of arts stream students spent comparatively less time on mobile phone use during COVID 19 lockdown.
6. There is significance association between gender of college students and time spent on mobile phone use before COVID 19 lock down. Majority of boy students spent more time as compared to girl students on mobile phone before COVID 19 lock down.
7. There is significance association between gender of college students and time spent on mobile phone for academic study during COVID 19 lock down. Majority of girl students spent more time as compared to boy students on mobile phone for academic study during COVID 19 lock down.
8. It is observed from the study that despite the fact that mobile phone distract college students from the their academic study majority of college students are agree that overall effect of mobile phone on their academic study is positive and smartphone motivate them to learn new things in new ways.
9. Finally application of t-test suggest that there is significant difference between mean values of time spent on mobile phone and different primary social media apps before and during covid 19 lockdown by the college students.

### **POINT OF NOTE AND SUGGESTIONS**

It is observed from the study that during COVID 19 lockdown average times spend on mobile phone by the college students have increased significantly due to e-learning and use of social networking apps. Many studies revealed that excessive use of mobile phone is harmful to human being as it causes many physical and psychological problems. Moreover, it is also observed from review of literature that various research studies supporting a negative association between students' frequency of smartphone use and their academic success. In the present study majority of college students have also assumed that mobile phone distract them from academic study. Therefore, in the situation where mobile phone has already consumed our two to three hours and reduce time with family, creating anxiety and promoting isolation, college students should understand that excessive use of smartphone is like double edge weapon. Thus, college students should use smartphone carefully. In this regard awareness should be disseminated among college students at mass level by teachers, govt. and parents together.

### **LIMITATIONS OF THE STUDY**

The present study may suffer from the following limitations:

1. The present study has been conducted on college students only hence its result may not be true for School and University students.
2. The study has been conducted in Himachal Pradesh so its findings may not be generalised in rest of the India.
3. Since sampling technique has been adopted to collect desired information so the study may be affected from sampling error.

### **IMPLICATIONS OF THE STUDY**

The present study will be helpful for educational policy maker to determine about the use of smartphone in schools and colleges on regular basis as well as lockdown period that may occur in future due to COVID 19 virus like diseases. Findings of the study may be a matter of concern to teachers, parents and govt. about side effects of excessive use of mobile phone on college students. Finally mobile phone companies can use the results of this study to design students' friendly mobile phone to increase their market share.

### **CONCLUSION**

It is well known fact that ICT and internet have played an important role in improving the quality of education. It has helped in providing versatile

educational services and methods to promote equal opportunity to obtain information and education. Smartphone are also proving important teaching and learning aid in present time especially in lockdown situations which are emerging due to Corona virus like diseases. Smartphone have helped students to continue their academic study from their own home in COVID 19 lockdown, when class room teaching was not possible. During lockdown period college students have significantly spent more average time on mobile phone due to e-learning and use of social networking apps. Despite, it is also observed from review of literature that various research studies supporting a negative association between students' frequency of smartphone use and their academic success. Therefore, it is true that excessive use of smartphone is like double edge weapon hence college students should use smartphone carefully. For this awareness should be disseminated among college students at mass level by concerned teachers, govt. and parents together.

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**Website**

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