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IMPACT OF SMARTPHONE ADDICTION ON THE STUDY HABIT AND MENTAL HEALTH OF HIGHER SECONDARY SCHOOL STUDENTS.

Sima Ghosh[1], Dr. Sumana Samanta Naskar[2*]
M.Ed. Student (Session:2020-2022)[1], Assistant Professor[2]
Department of Teacher Education[1,2]
Baba Saheb Ambedkar Education University (Erstwhile WBUTTEPA)[1,2]
25/2& 25/3 Ballygunge Circular Road
Pin-700019,Kolkata

Abstract:

The present study aims to investigate the impact of smartphone addiction on the study habit and mental health of higher secondary school students. The data has been collected from 257 higher secondary school students in the district of Purba Bardhaman in West Bengal using simple random sampling technique. Three standardized questionnaires on Smart phone addiction, mental health and study habit were given to the students for collecting data. For analysis of data IBM SPSS 22.0 software was used. It is concluded that difference in smart phone addiction is significant in relation to gender and locale. The difference in Mental health is significant in relation to gender, but there is no such significance in relation to locale. Difference in study habit is insignificant in relation to both gender and locale. In the analysis of correlation between smart phone addiction and mental health it was found that both these variables are positively correlated. On the other hand, there is negative correlation between smart phone addiction and study habit. It is also found that mental health and study habit are positively correlated. While doing impact analysis it is found that smartphone addiction has significant impact on both the study habit and mental health of higher secondary school students.

Index terms: Smart Phone Addiction, Mental Health and Study Habit.

1.Introduction:

Smartphone addiction is an important issue of concern worldwide in the 21st century. It is posing a great threat for the adolescents who fall easy prey in its snare. It had become indispensable especially in the covid-19 pandemic scenario when online classes were in full progress. Adolescence is a tender age between childhood and adulthood. This stage is the career determinant. If the students fall victim to this vicious addiction at this stage, they will suffer from lack of concentration, isolation, sleep disorder, lack of self-confidence and other behavioural disorders which will ruin their mental development.

Specifically, adolescents are a high-risk group for smartphone addiction. Adolescents are strongly attached to their smartphone, and they regard a smartphone as their second self. Many smartphone users have reported that they would not be able to live without a smartphone (Wajcman et al., 2007). When these characteristics, including novelty seeking in adolescents, are combined with their immature control competence, they are placed at a high risk of smartphone addiction (Chambers et al., 2003).

Excessive smartphone addiction can result in mental health related issues like anxiety, stress, depression and decreased study habit. The present study will examine the impact of smart phone addiction on the study habit and mental health of higher secondary school students.

1.1. Background of the study.

Smartphone's offer several conveniences in our life, but we also need to be aware of the negative effects of Smartphone use, the most concerning aspect being Smartphone addiction. Smartphone addiction is a phenomenon that pertains to uncontrollability of Smartphone use. People with this problem encounter social, psychological, and health problems (Heron and Shapiro, 2004; Young, 1999). The global surge in use has led to an ever-increasing dependency on smart

phones because of their embedded functionalities and portability factor. Some people, especially the younger generation, prefer a Smartphone over a laptop and personal computers because of the various multifunctioning capacity of smart phones, such as entertainment, watching sports, online games, online banking, sending emails, chatting, agenda tracking, online shopping, social media (face book, twitter, Instagram, YouTube, WhatsApp etc.). As a result of this excessive smartphone use their homework is left incomplete. (Cha & Seo, 2018; Nayak, 2018). This addiction towards smart phones not only affect the study habit of students, but it also hampers their mental health causing sleep disturbance, anxiety, depression etc.

1.2 Rationale of the Study:

In this modern era of globalization, where people can easily connect with each other by internet, smartphones are one of the most frequently used communication devices which are used by everyone, particularly the adolescents. Although smartphone facilitates the daily lives of people in diverse ways, at the same time these smartphones, bring them many psychological problems like restlessness, depression and dissatisfaction as well as intervene with their interpersonal relations, at the end of which, the person becomes alone. Moreover, people indulge themselves into different applications of smartphone like Instagram, Facebook, and Google Play Store that does not only badly affect their academic performances but also their relationship with families, peers and relatives.

Due to addiction of smartphone, lack of interpersonal relation and face to face interaction, they may feel alone.

Therefore, the aim of the present study is to examine the smartphone addiction as a predictor of interpersonal relationships and loneliness in higher secondary school students. Moreover, the present study helps to fulfil the gap in previous researches, particularly there is limited literature available on smartphone addiction in relation to mental health and study habit.

1.3. Significance of the Study:

The present study will enable higher secondary students to identify their level of smartphone addiction and how it is affecting their study habit and mental health. The study will bring into light the level of Smartphone addiction among male female students, whether it varies across different locales. The study will focus on students' growing addiction towards smart phones and how it is affecting their mental health causing anxiety, depression and isolation.

1.4. Statement of the problem:

The present is entitled "The Impact of Smartphone addiction on the Study Habit and Mental Health of Higher Secondary School Students." The aim of this study is to find how smart phone addiction is impacting the study habit and mental health of higher secondary school students in the district of Purba Bardhaman. This study seeks to establish a relation between smart phone addiction and study habit on the one hand and smart phone addiction and mental health on the other.

1.5. Objectives of the study:

O_1: To study the level of Smartphone addiction among Higher Secondary Students on the basis of gender and locale.
O_2: To examine the mental health condition on the basis of gender and locale.
O_3: To observe the level of study habit on the basis of Gender and Locale.
O_4: To find out relationship between smart phone addiction and mental health.
O_5: To find out relationship between smart phone addiction and study habit.
O_6: To find out relationship between mental health and study habit.
O_7: To examine the impact of Smartphone addiction on the study habit of higher secondary school students.
O_8: To examine the impact of Smartphone addiction on the Mental Health of higher secondary school students.

1.6. Hypotheses of the study:

To test the hypotheses statistically the researcher used null hypotheses. According to the objectives the null hypotheses are given below.

$H_0$1.1: There is no significant difference in the level of Smartphone addiction between male and female Higher Secondary School Students.
$H_0$1.2.: There is no significant difference in the level of Smartphone addiction between rural and urban Higher Secondary School Students.
$H_0$2.1: There is no significant difference in the condition of Mental Health between male and female Higher Secondary School Students.
$H_0$2.2.: There is no significant difference in the condition of Mental Health between rural and urban Higher Secondary School Students.
$H_0$3.1: There is no significant difference in the level of Study Habit between male and female Higher Secondary School Students.
$H_0$3.2.: There is no significant difference in the level of Study Habit between rural and urban Higher Secondary School Students.
$H_0$4: There is no relationship between smart phone addiction and mental health.

$H_0$5: There is no significant relationship between smart phone addiction and study habit.
$H_0$6: There is no significant relationship between mental health and study habit.
$H_0$7: There is no significant impact of Smartphone addiction on the study habit of higher secondary school students.
$H_0$8: There is no significant impact of Smartphone addiction on the Mental Health of higher secondary school students.

1.7. Operational definition of important terms:

Smart phone addiction:

Smart phone addiction consists of four main components: obsessive phone use, behaviours such as repetitive checking for messages or updates; tolerance or longer and more intense of use; withdrawal or feelings of agitation or suffering without the phone; and functional impairment or interference with other life activities and face to face social relationships.

Study habit:

Study habit is an action such as reading, taking notes, holding study groups which the students perform regularly and habitually in order to accomplish the task of learning. Building Good study habit is important for academic advancement of the students.

Mental health:

Mental health refers to cognitive, behavioural, and emotional well-being. It is all about how people think, feel, and behave. People sometimes use the term "mental health" to mean the absence of a mental disorder. Mental health can affect daily living, relationships, and physical health. According to WHO definition, "Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community."

1.8. Delimitation of the study:

- The study was delimited to the higher secondary students in the district of Purba Bardhaman only.
- The study was focused on the independent variable (smart phone addiction) and two dependent variables (Study habit and mental health) and other categorical variables (gender, locales) only.
- Sample size consisted of 257 higher secondary students only.

2.Review of related literature:

Bolle, C.L(2014) presented the views on the process of developing Smartphone addiction. Smartphone's effect on social usage, process usage and emotional intelligence was examined. An empirical study was conducted on a population of 386 Dutch people. It is found that younger people and mostly the females are susceptible to this addiction resulting in higher level of social stress and weak self-regulation. **Appiah, M.K. (2016)** examined the effect of using WhatsApp on the study habit of university students in the Kumasi metropolis of Ghana **Tran, D. (2016)** examined the effect of nomophobia i,e. the anxiety caused by the loss of a Smartphone and its resulting behavioural disorder. The researcher used descriptive research method to establish the relation between nomophobia and resulting behavioural inconsistencies. **Lutfiani, D. (2018)** studied how using gadget is affecting the study habit in the area of English learning. This research used descriptive qualitative study approach. To collect the data, the researcher used interview. **Thomee, S.(2018)** pondered upon the links between mobile phone use and mental health from a psychological or behavioural perspective. Self-reporting was the dominating method of measurement. **Huckins, F.J., Campbell, T.A,(2020)** Studied how mental health got affected at the onset of COVID 19 pandemic. The research was carried out by combining mobile phone sensing and self-reported mental health data among college students. Behaviours such as the number of locations visited, distance travelled, duration of phone usage, number of phones unlocks, sleep duration, and sedentary time were measured using the Student's Life Smartphone sensing app. During the first academic term impacted by COVID-19 (Winter 2020), individuals were more sedentary and reported increased anxiety and depression symptoms relative to previous academic terms and subsequent academic breaks. **Gezgin. M.D, Gurbuz.F, Barburoglu.Y(2021)** tried to establish a significant correlation between high school students' reading habit and their smartphone addiction level. The study was conducted upon 512 students, studying in the Turkish cities of Istanbul and Edrine. The study proved that girls were more prone to smartphone addiction than the boys. It also revealed a significant positive correlation between smartphone addiction and reading habit. Motivation have left a huge impact on academic performance. Although the textbook reading intensity sometimes mediates the effect of smartphones on academic performance achievement motivation has a positive impact on academic performance. **Lai,X., Nic,C., Huang,S., Li,Y., Xin,T., Zhang,C., Wang,Y.(2022)** studied the negative association between the growth mindset and mental health problems. Using a three-wave longitudinal design, the researchers obtained data from a diverse sample of Chinese adolescents (n = 2543). In addition, the mediating effects of Smartphone use for entertainment and problematic Smartphone use (PSU) were examined. Smartphone use for entertainment and PSU mediate the effect of mindset on adolescent mental health.**Dasgupta,P.,Bhattacharjee,S.,Dasgupta,S.,Roy,J.K.,Mukherjee,A.,Biswas,R.(2017)**examined how growing use of smartphone among Indian college students has resulted in considerable issues of "nomophobia" (NMP) or feelings of discomfort or anxiety experienced by individuals whenever unable to use their smart phones. The researcher

found that NMP has emerged as a significant cause of concern among both the groups. Standardized measures for identification and appropriate psycho-behavioural therapy for those seeking help might alleviate the problem.**Nayak, J.K. (2018)** examined smart phone addiction on students' academic performance and the effect of gender and relationship status on Smartphone usage.. Apart from behavioural changes female students were found to have hardly any effect of Smartphone addiction on them, unlike the male students who were found to neglect work, feel anxious and lose control of themselves. **Saraswathi,I., Saikarthik,J.,Kumar, K.S.,Srinivasan,K.M.,Ardhanaari,M., Gunapriya, R.(2000)** have studied the impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college.. The COVID-19 pandemic appears to negatively affect the mental health of the undergraduate medical students with the prevalence and levels of anxiety and stress being increased, and depression symptoms remaining unaltered. Addressing and mitigating the negative effect of COVID-19 on the mental health of this population is crucial. **Chaturvedi,K., Viswakarma,D.K., Singh,N.(2021)** explored the impacts of this pandemic on the lives of students. The researcher conducted a survey of 1182 individuals of different age groups from various educational institutes in Delhi - National Capital Region (NCR), India. The researchers found that in order to deal with stress and anxiety, participants adopted different coping mechanisms and also sought help from their near ones. Further, the researchers examined the student's engagement on social media platforms among different age categories. **Patel,S., D&,L.,Shwetha, K.T.(2022**) Studied the level of addiction with smart phone and its relation with anxiety, stress, loneliness and depression. Studies showed that smart phone addiction is associated with psychological distress like anxiety, stress, loneliness, and depression.

Critical Discussion of the literature:

Researches in this area indicate that there is difference in the use of smartphone between male and female. Bolle, C.L(2014) opines that females are more susceptible to this than the males, while Bisen. S, Deshpande. Y(2016) was of the opinion that male students are more addicted than the females. Emmanuel, O., Stephen, O.(2018) , Appiah, M.K.(2016) argued that smart phone addiction results in poor study habit, on the other hand, Lutfiani, D.(2018) opines that it significantly enhances their English learning. Patel, S., D&,L., Shwetha, K.T.(2022), Dasgupta, P., Bhattacharjee, S., Dasgupta, S .,Roy, J.K., Mukherjee, A., Biswas, R.(2017) et al. have studied how smart phone addiction adversely affect the mental health condition of the students causing anxiety, stress, depression, sleep disorder and many other behavioural problems. After studying the related literature in this area, the researcher found the research gap in Impact of Smartphone Addiction on the Study habit and Mental health of Higher Secondary School Students.

3.Methodology:

3.2 Type of the Research: Quantitative research technique has been used here. It is a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical or computational techniques.

3.3: Population

The present study was related to smartphone addiction, mental health and study habits of higher secondary school students. For this reason, the population was selected from the higher Secondary School students of West Bengal under academic control of West Bengal Council of Higher Secondary Education (W.B.C.H.S.E.).

3.4 Sample & Sampling technique:

The sample represents a small proportion of the target population. 257 higher secondary school students were taken as samples from the population through random sampling technique. At first five schools were randomly selected from the district of Purba Bardhaman in the state of West Bengal. Out of the selected schools, two schools were from urban areas and three schools were from rural areas.

3.5. Variables of the Study:

Major and Categorical Variables for Comparison Study: In this present study three major variables were taken which are smart phone addiction, mental health and study habit. In the comparison study the major variables were treated as dependent variables and categorical variables (Gender and locale) were treated as independent variables.

Table1: of Major and Categorical Variables

Major Variables	Categorical Variables
Smart Phone Addiction	Gender(Male/Female)
Mental Health	Locale(Rural/Urban)

3.6. Tools:

In this study three scales are used for data collection. All these three scales were developed and standardized by the researcher and the supervisor of the researcher. The scales are as follows:

- Smart phone Addiction Scale (www.researchgate.net)
- DASS 21 for Mental Health (htps://maic.qld.gov.au)
- Study Habit Scale (https://people.engr.tamu.edu)

Description about Smart phone Addiction Scale: Smart phone addiction scale is a scale for measuring smart phone addiction that consisted of six factors and 33 items with a six-point Likert scale (1: "strongly disagree" and 6: "strongly

agree") based on self-reporting. The six factors were daily-life disturbance, positive anticipation, withdrawal, cyberspace-oriented relationship, overuse, and tolerance. In this study, the internal-consistency test result (Cronbach's alpha) of SAS was 0.872

Description about DASS 21(Mental Health Scale): The DASS is a set of three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. It contains 21 items (7 item for each component). It was developed by the researchers at the University of New South Wales(Australia). In this study the internal consistency test result of DASS 21 is (Cronbach's Alpha).771 that indicates the scale is reliable.

Description of Study Habit Scale: This scale is developed by Ttexas A&M University. The purpose of this scale is to help the researchers in getting information regarding how well a student study. It consists of 50 items. In this study the internal consistency result of Study Habit Scale is (Cronbach's Alpha)=.794 that indicates the scale is reliable.

3.7: Data Analysis:

3.9.1: Normality with Respect to Gender

Table 2: Descriptive Statistics of Smart Phone Addiction with Respect To Gender.

Gender			Statistic	Std. Error
Smart Phone Addiction	Male	Mean	94.34	2.428
		Median	97.50	-----
		Variance	518.84	-----
		Std. Deviation	22.778	-------
		Skewness	-.204	.257
		Kurtosis	-.595	.508
	Female	Mean	102.07	1.852
		Median	104.00	---
		Variance	579.34	---
		Std. Deviation	24.070	---
		Skewness	.105	.187
		Kurtosis	.107	.371

From the above **Table 2** in case of male the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was -.204/.257=-0.793 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.595/.508=-1.17 (As per the assumption of Tabachnick & Fidell, 2007). Both these values were under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). In case of female the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .105/.187=0.561 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was .107/.371=0.288 (As per the assumption of Tabachnick & Fidell, 2007). Both these values were also under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). Hence the score distribution of Smart Phone Addiction with respect to gender was normal in nature.

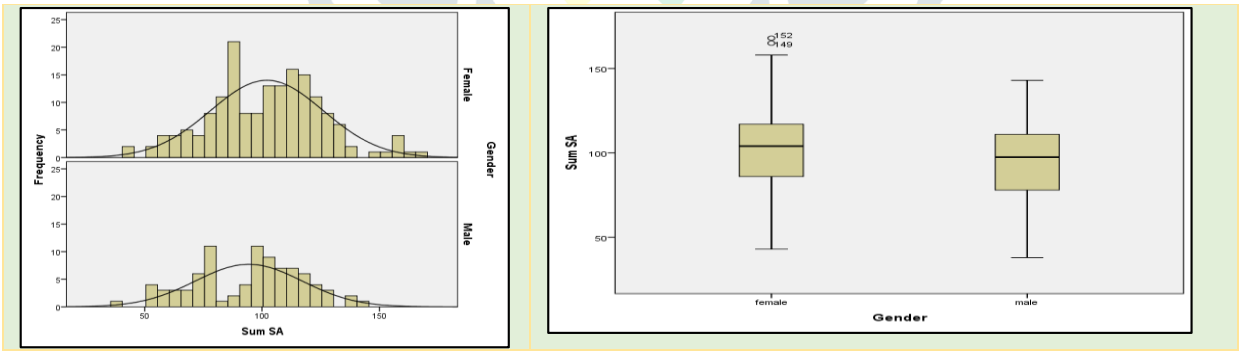

Fig.1: Histograms and Box plot(with outlier) of Smart Phone Addiction with respect to Gender

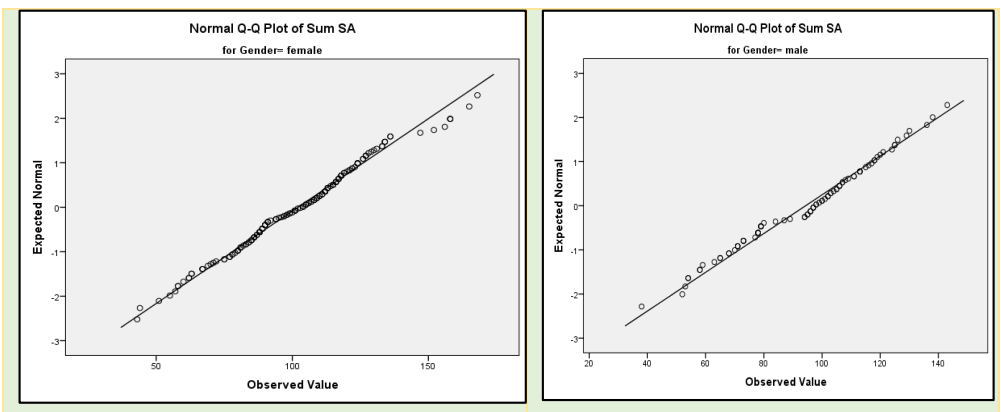

Fig.2.: Q-Q Plot of Smart Phone Addiction w.r.t Gender.

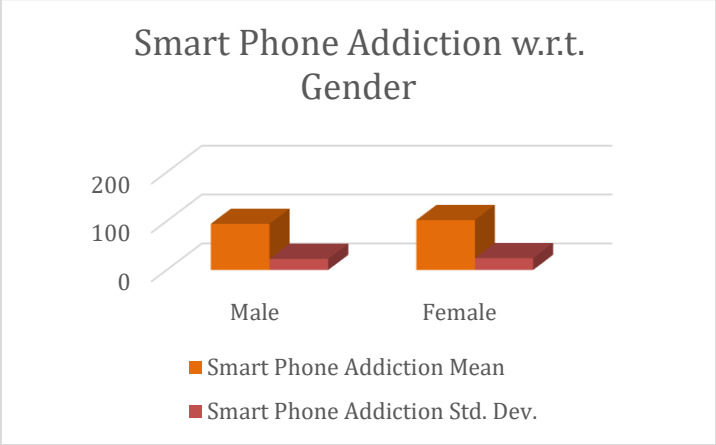

Fig.3.: Bar diagram of Smart Phone Addiction w.r.t Gender.

b) Mental Health with Respect to Gender:

Table 3.: Descriptive Statistics of Mental Health with Respect to Gender.

	Gender		Statistic	Std. Error
Mental Health	Male	Mean	15.45	.880
		Median	14.00	---
		Variance	68.205	---
		Std. Deviation	8.259	---
		Skewness	.530	.257
		Kurtosis	-.343	.508
	Female	Mean	18.18	.662
		Median	18.00	---
		Variance	74.087	---
		Std. Deviation	8.607	---
		Skewness	.740	.187
		Kurtosis	.620	.371

From the above **Table 3** male the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was.530/.257=2.062 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.343/.508=-0.675 (As per the assumption of Tabachnick & Fidell, 2007). Both these values were under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). In case of female the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .740/.187=3.95 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was .620/.371=1.671. In this case although ZKu value was under the range of ±3 and fulfil the assumptions of normality, the ZSk value is slightly higher. The data is considered keeping in mind the majority value tends to follow normality. Hence Mental Health with respect to gender was normal in nature.

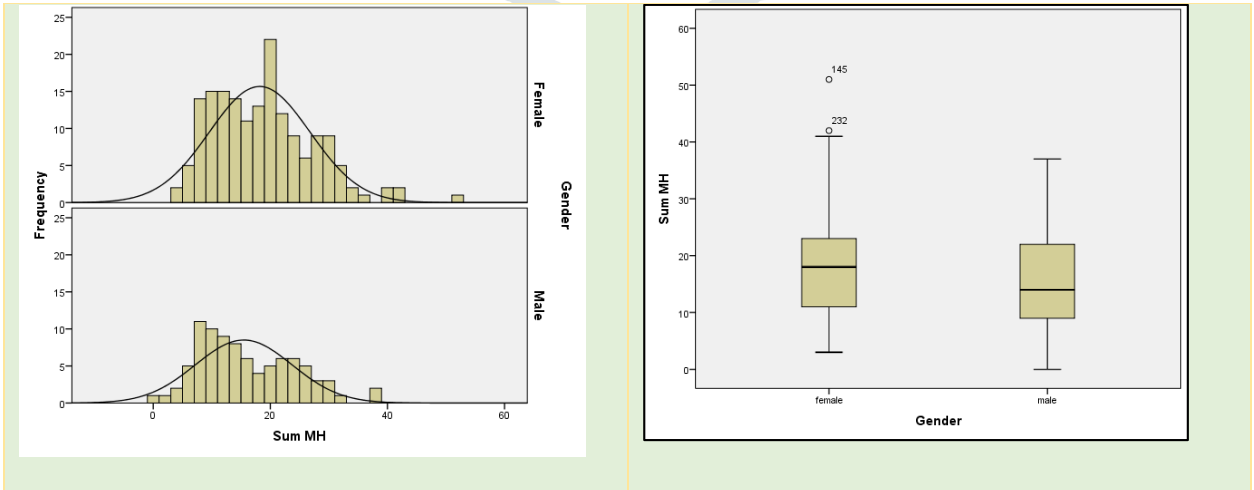

Fig:4.: Histograms and Box plot(with outlier) of mental health with respect of gender.

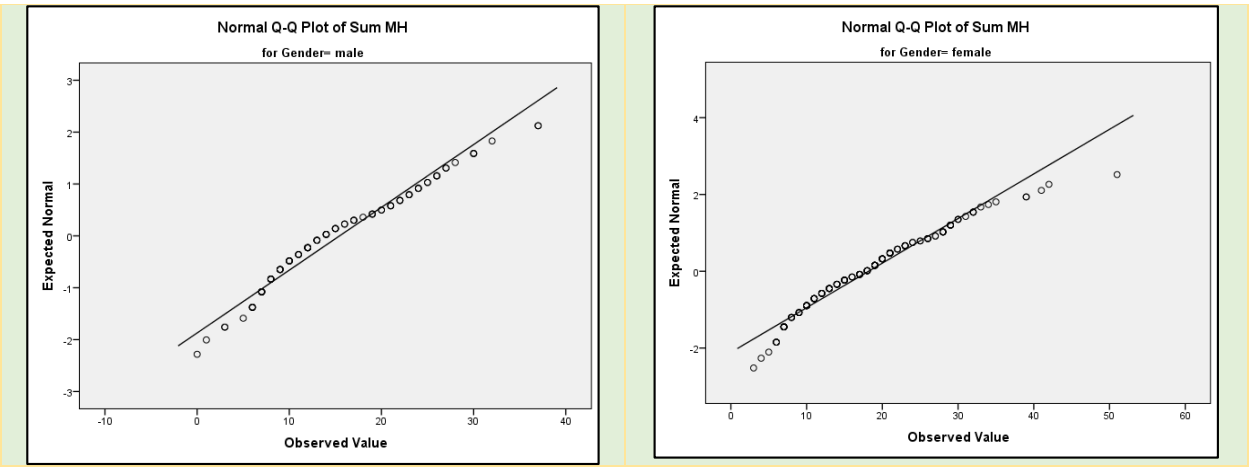

Fig.5:Q-Q plot of Mental Health w.r.t Gender

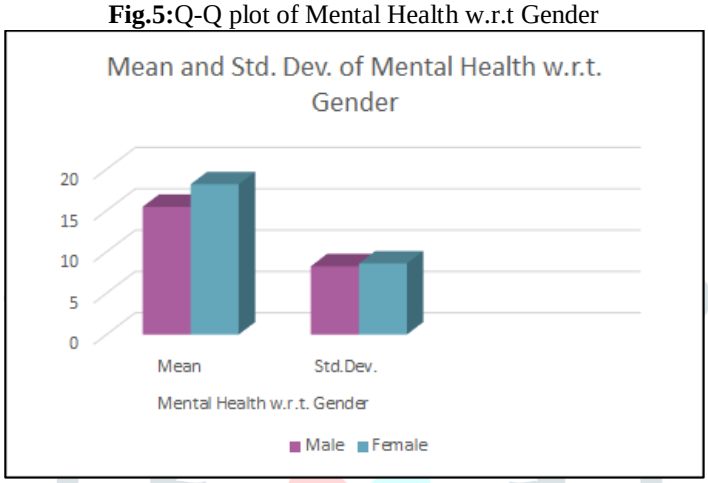

Fig 6: Bar Diagram of Mental Health w.r.t Gender.

c)Study Habit with Respect to Gender:

Table 4. Descriptive Statistics of Study Habit with Respect to Gender.

Gender			Statistic	Std. Error
Study Habit	Male	Mean	32.69	0.729
		Median	32.00	---
		Variance	46.744	---
		Std. Deviation	6.837	---
		Skewness	.105	0.257
		Kurtosis	-.907	0.508
	Female	Mean	33.60	0.501
		Median	34.00	---
		Variance	42.373	---
		Std. Deviation	6.509	---
		Skewness	-.348	.187
		Kurtosis	-.245	.371

From the above **Table 4** showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .105/.257=.408 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.907/.508=-1.785(As per the assumption of Tabachnick & Fidell, 2007). Both these values were under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). In case of female the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was -.348/.187=-1.860 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.245/.371=-0.660(As per the assumption of Tabachnick & Fidell, 2007). Both these values were also under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). Hence the score distribution of Study Habit with respect to gender was normal in nature.

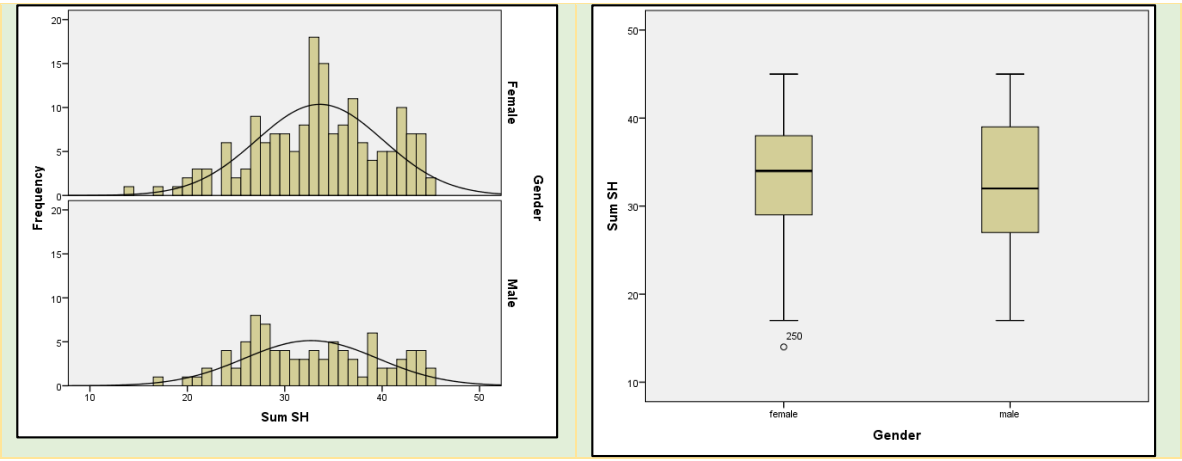

Fig 7: Histograms and Box plot(with outlier) of Study Habit with Respect to Gender

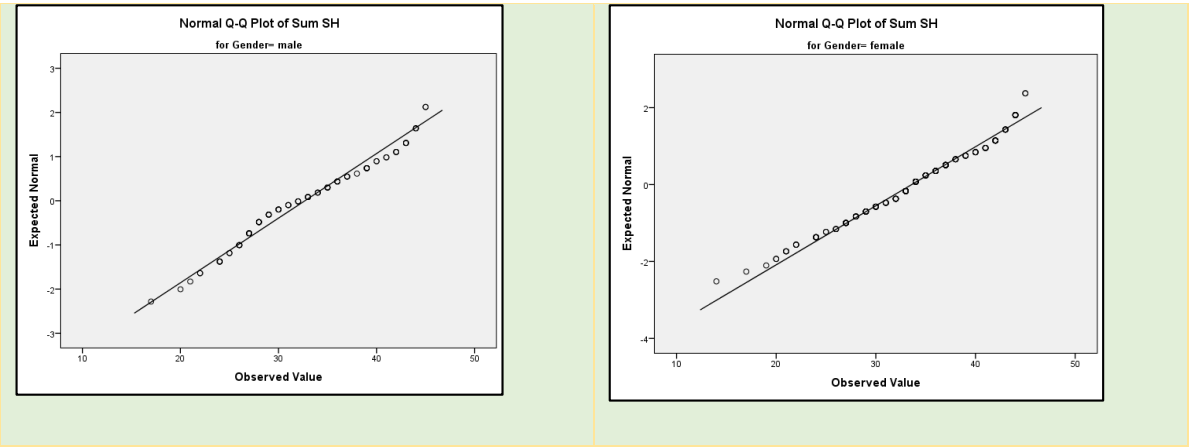

Fig.8.:Q-Q plot of study habit w.r.t Gender

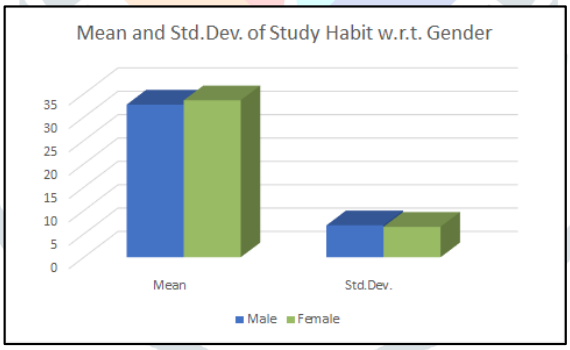

Fig.9: Bar diagram of study habit w.r.t Gender

3.9.2: Normality with Respect to Locale:

a) Smart Phone Addiction with Respect to Locale:

Table 5: Descriptive Statistics of Smart Phone Addiction with respect to Locale.

	Locale		Statistic	Std. Error
Smart Phone Addiction	Rural	Mean	101.88	1.819
		Median	102.00	---
		Std. Deviation	23.790	---
		Skewness	.111	.186
		Kurtosis	.106	.369
	Urban	Mean	94.52	---
		Median	96.00	---
		Std. Deviation	23.417	---
		Skewness	-.146	.260
		Kurtosis	-.469	.514

From the above **Table 5** showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .111/.186=0.596 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was .106/.369=.287(As per the assumption of Tabachnick & Fidell, 2007). Both these values were under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). In case of urban the study showed that the co-

efficient of ZSk (Skewness divided by the standard error of Skewness) was -.146/.260=-0.561and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.469/.514=-0.912(As per the assumption of Tabachnick & Fidell, 2007). Both these values were also under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). Hence the score distribution of Smart Phone Addiction with respect to Locale was normal in nature.

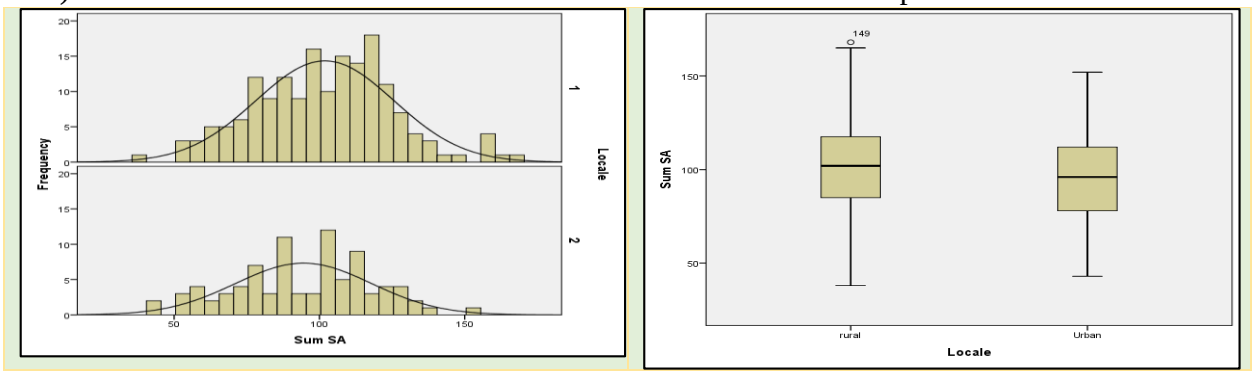

Fig 10: Histograms and Box plot(with outlier) of Smart Phone Addiction with Respect to Locale.

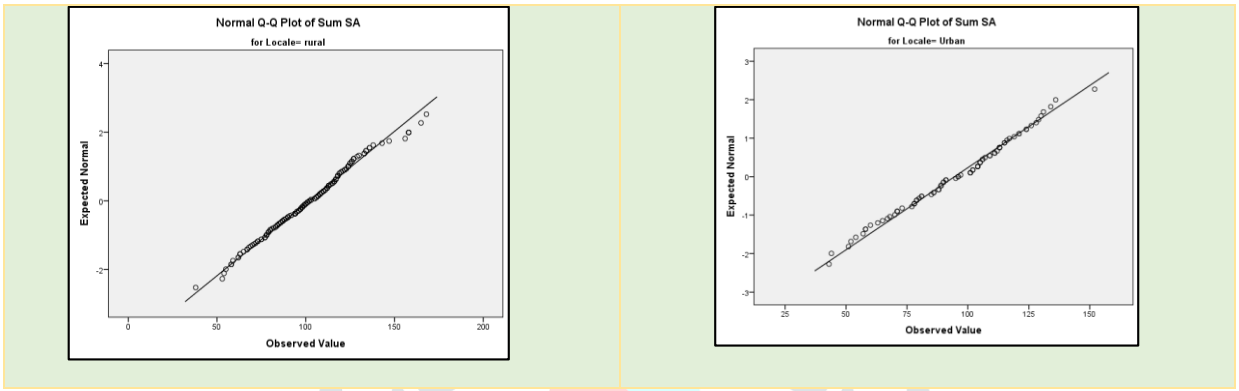

Fig.11: Q-Q plot of Smart Phone Addiction with Respect to Locale.

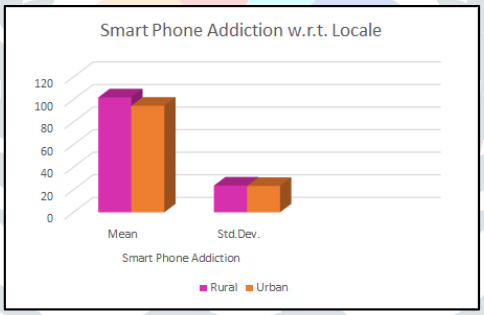

Fig.12: Bar diagram of Smart Phone Addiction w.r.t Locale.

b) Mental Health with Respect to Locale

Table 6: Descriptive Statistics of Mental Health with respect to Locale.

Locale		Statistic	Std. Error
Rural	Mean	17.64	.634
	Median	17.00	---
	Variance	68.831	---
	Std. Deviation	8.296	---
	Skewness	.567	.186
	Kurtosis	-.091	.369
Urban	Mean	16.45	.980
	Median	15.00	---
	Variance	82.674	---
	Std. Deviation	9.093	---
	Skewness	.876	.260
	Kurtosis	1.231	.514

From the above **Table 6** showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .567/.186=3.048 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.091/.369=-0.246. Here, it is found that although ZKu value meet the standard of normality, ZSk value is slightly higher. But the data is considered to be normal keeping in mind the average normality of the dataset. In case of urban schools, the study showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was .876/.260=3.369 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was 1.231/.514=2.394. Here it is

observed that the ZSk value is slightly higher than the standard of normality(As per the assumption of Tabachnick & Fidell, 2007). But the data is considered to be normal keeping in mind the average normality of the dataset. Hence the score distribution of Mental Health with respect to Locale was normal in nature.

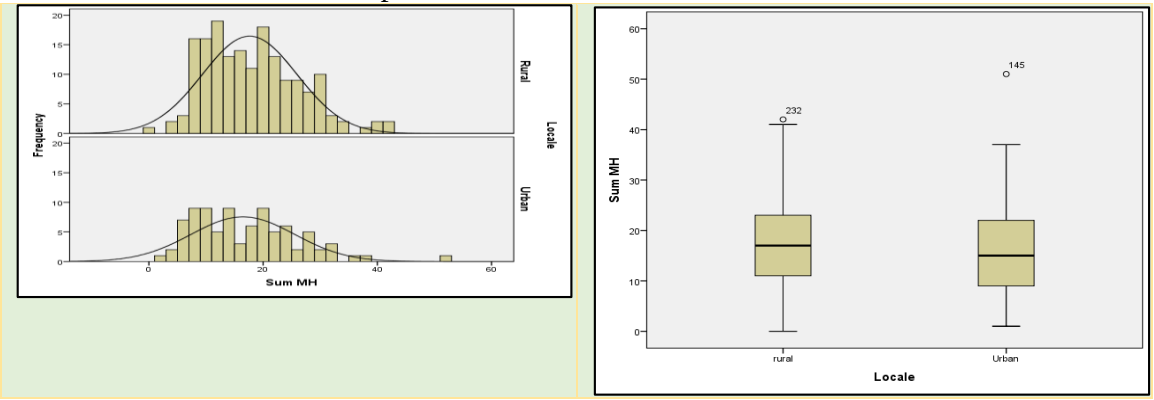

Fig 13: Histograms and Box plot(with outlier) of Mental Health with Respect to Locale.

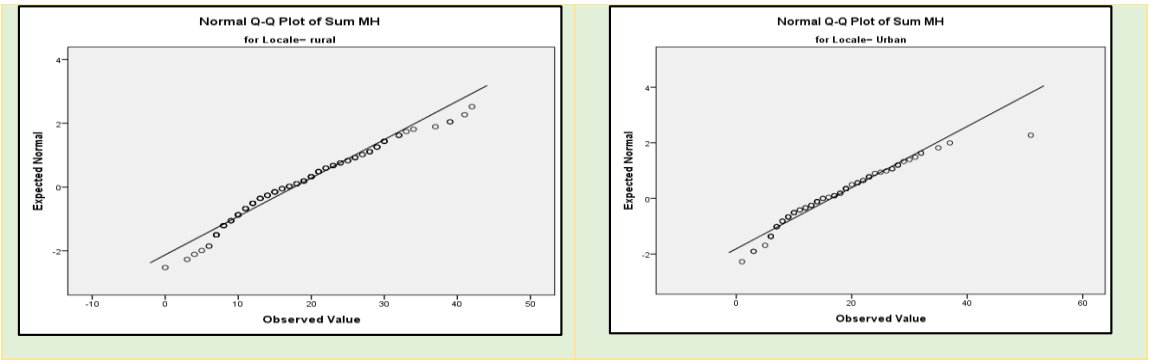

Fig.14: Q-Q Plot of Mental Health with Respect to Locale.

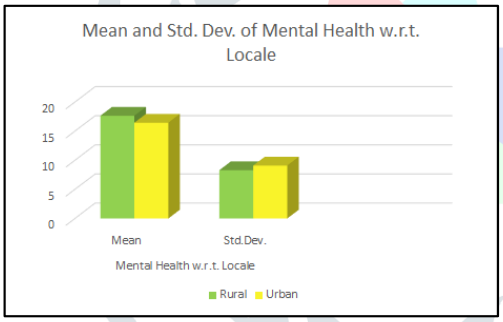

Fig. 15: Bar Diagram of Mental Health w.r.t Locale

c. Study Habit with respect to Locale:

Table 7: **Descriptive Statistics of Study Habit with Respect to Locale**

	Locale		Statistic	Std. Error
Study Habit	Rural	Mean	33.21	.497
		Median	33.00	---
		Variance	42.226	-----
		Std. Deviation	6.498	----
		Skewness	-.145	.186
		Kurtosis	-.504	.369
	Urban	Mean	33.44	.744
		Median	33.50	----
		Variance	47.661	----
		Std. Deviation	6.904	---
		Skewness	-.265	.260
		Kurtosis	-.610	.514

From the above **Table 7** showed that the co-efficient of ZSk (Skewness divided by the standard error of Skewness) was -.145/.186=-0.779 and the co-efficient of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.504/.369=-1.36 (As per the assumption of Tabachnick & Fidell, 2007). Both these values were under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). In case of urban schools, the study showed that the coefficient of ZSk (Skewness divided by the standard error of Skewness) was -.265/.260=-1.019 and the co-efficient

of ZKu (Kurtosis divided by the standard error of Kurtosis) was -.610/.514=-1.186 (As per the assumption of Tabachnick & Fidell, 2007). Both these values were also under the range of ±3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007). Hence the score distribution of Study Habit with respect to Locale was normal in nature.

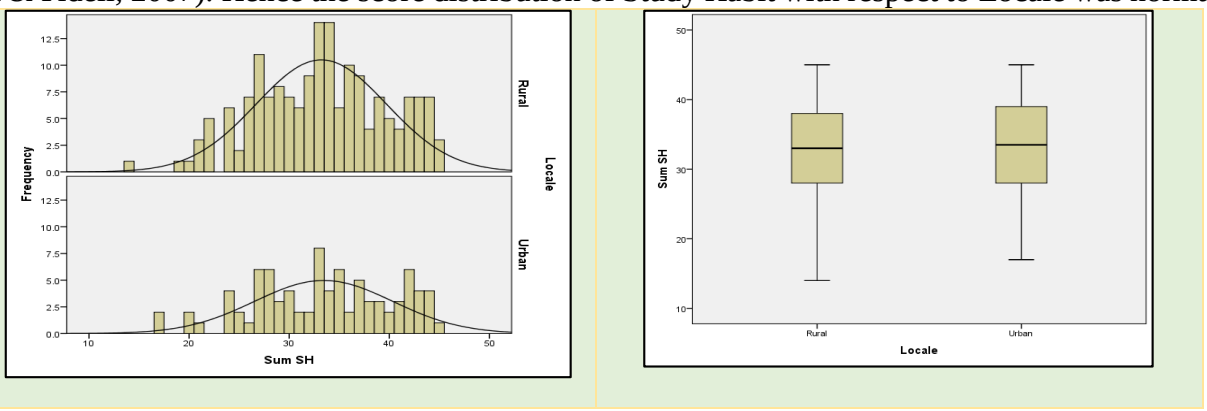

Fig.16: Histograms and Box plot(without outlier) of Study Habit with Respect to Locale

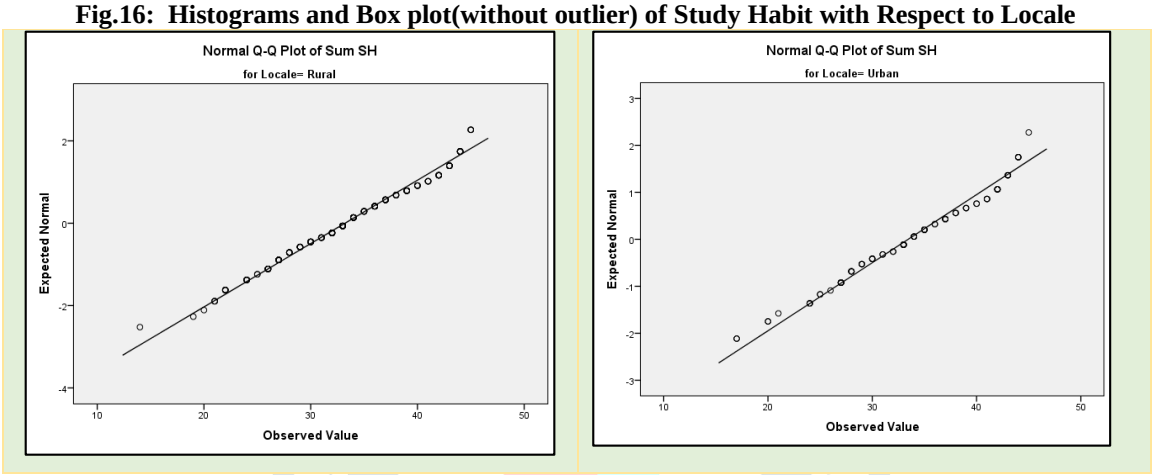

Fig.17: Q-Q plot of Study Habit w.r.t Locale.

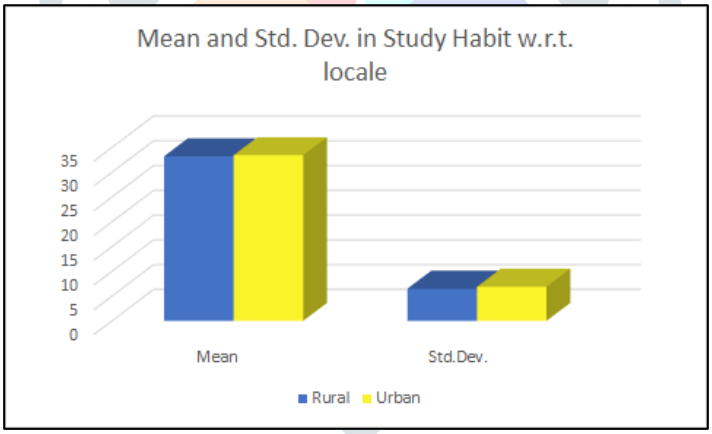

Fig.18 Bar diagram of study habit w.r.t Locale

In all the cases after removing outlier:

- Histogram indicated that data can be considered as normally distributed.
- Q-Q plot indicated that the distribution of score was on straight line.

From the above graphical representation, it was concluded that distribution is normal in nature. So parametric statistics can be used for analysis of data.

Data Analysis and Interpretation:

Testing of $H_0$1.1

$H_0$1.1: There is no significant difference in the level of Smartphone addiction between male and female Higher Secondary School Students.

Table 8: Independent Sample Test Between Groups (Male and Female)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Smart phone addiction	Equal variances assumed	.075	.785	2.486	255	.014	7.724	3.107	1.605	13.843

From the above **Table 8** of group statistics of smart phone addiction with respect to gender shows that F value is .075 and its associated significance value is .785 ($p>0.05$). Thus, homogeneous variances can be assumed for two groups of gender. Analysis of t-test for Equality of Means between two groups shows that $t_{(255)}$ value is 2.486 and its associated significance value is .014($p<0.05$). Hence t is significant at 0.05 level and therefore the **$H_0$1.1** is rejected. It is concluded that there is a significant difference in Smart phone Addiction of higher secondary school students in relation to their gender i.e. mean difference of Smart Phone Addiction between male and female group is significant.

Testing of $H_0$2.2

$H_0$2.2: There is no significant difference in the level of Smartphone addiction between rural and urban Higher Secondary School Students.**:**

Table 9: Group Statistics of Smart Phone Addiction with respect to locale

Locale		N	Mean	Std. Deviation	Std. Error Mean
Smart Phone Addiction	Rural	171	101.88	23.790	1.819
	Urban	86	94.52	23.417	2.525

Table 10: Independent Sample Test Between Groups (Rural and Urban)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Smart Phone addiction	Equal variances assumed	.032	.858	2.352	255	.019	7.360	3.129	1.199	13.521

Interpretation: From the above **Table-10** t-test for Equality of Means between two groups shows that $t_{(255)}$ value is 2.352 and its associated significance value is 0.019 ($p<0.05$). Hence t is significant at 0.05 level and therefore **$H_0$2.2** is rejected. It is concluded that there is a significant difference in mean score of Smart Phone Addiction of the higher secondary school students in relation to locales i.e. mean difference of Smart Phone Addiction between rural and urban group is significant.

$H_0$2.1: There is no significant difference in the condition of Mental Health between male and female Higher Secondary School Students.

Table 11: Group Statistics of Mental Health with respect to Gender

Locale		N	Mean	Std. Deviation	Std. Error Mean
Mental Health	Female	169	18.18	8.607	.662
	Male	88	15.45	8.259	.880

Table 12: Independent Sample Test Between Groups (Female and Male)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Mental Health	Equal variances assumed	.001	.978	2.440	255	.015	2.723	1.116	.525	4.921

Interpretation: From the above **Table-12** Analysis of t-test for Equality of Means between two groups shows that $t_{(255)}$ value is 2.440 and its associated significance value is 0.015 ($p<0.05$). Hence t is significant at 0.05 level and therefore **$H_0$2.1** is rejected. It is concluded that there is a significant difference in mean score of Mental Health of the higher secondary school students in relation to gender i.e. mean difference of mental health between female and male group is significant.

$H_0$2.2: There is no significant difference in the condition of Mental Health between rural and urban Higher Secondary School Students.

Table 13: Group Statistics of mental health with respect to locale

Locale		N	Mean	Std. Deviation	Std. Error Mean
Mental Health	Rural	171	17.64	8.296	.634
	Urban	86	16.45	9.093	.980

Table 14: Independent Sample Test Between Groups (Rural and Urban)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Mental Health	Equal variances assumed	.577	.448	1.050	255	.295	1.190	1.133	-1.041	3.421

Interpretation: From the above **Table 14** of group statistics of Mental Health with respect to Locale shows analysis of Levene's test for equality of Variances shows that F value is .577 and its associate significance value is .448 ($p>0.05$). Thus, homogeneous variances can be assumed for two groups of locales. Analysis of t-test for Equality of Means between two groups shows that $t_{(255)}$ value is 1.050 and its associated significance value is 0.295 ($p>0.05$). Hence t is not significant at 0.05 level and therefore **$H_0$2.2** is not rejected. It is concluded that there is no significant difference in mean score of Mental Health of the higher secondary school students in relation to locales i.e. mean difference of Mental health between rural and urban group is not significant.

$H_0$3.1: There is no significant difference in the level of Study Habit between male and female.

Table15: Group Statistics of Study Habit with respect to Gender

Gender		N	Mean	Std. Deviation	Std. Error Mean
Study Habit	Female	169	33.60	6.509	.501
	Male	88	32.69	6.837	.729

Table 16: Independent Sample Test Between Groups (Female and Male)

	Levene's Test for Equality of Variances	t-test for Equality of Means

		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Study Habit	Equal variances assumed	1.804	.180	1.039	255	.300	.904	.871	-.810	2.619

From the Table-16 he analysis of Levene's test for equality of Variances shows that F value is 1.804 and its associate significance value is .180 ($p>0.05$). Thus, homogeneous variances can be assumed for two groups of locales. Analysis of t-test for Equality of Means between two groups shows that $t_{(255)}$ value is 1.039 and its associated significance value is 0.300 ($p>0.05$). Hence t is not significant at 0.05 level and therefore **$H_0$3.1** is not rejected. It is concluded that there is no significant difference in mean score of Study Habit of the higher secondary school students in relation to gender i.e. mean difference of Study Habit between female and male group is not significant.

$H_0$3.2: There is no significant difference in the level of Study Habit between rural and urban.

Table17: Independent Sample Test Between Groups (Rural and Urban)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Study Habit	Equal variances assumed	.679	.411	-.264	255	.792	-.231	.877	-1.959	1.496

Interpretation: From the above **Table 17** of group statistics of Study Habit with respect to Locale Levene's test for equality of Variances shows that F value is .679 and its associate significance value is .411($p>0.05$). Thus homogeneous variances can be assumed for two groups of locales. Analysis of t-test for Equality of Means between two groups shows that $t_{(255)}$ value is -.264 and its associated significance value is 0.792 ($p>0.05$). Hence t is not significant at 0.05 level and therefore **$H_0$6** is not rejected. It is concluded that there is no significant difference in mean score of Study Habit of the higher secondary school students in relation to locales i.e. mean difference of Study Habit between rural and urban group is not significant.

$H_0$4: There is no relationship between smart phone addiction and mental health.

Table 18: Correlation between Smart phone addiction and mental health.

Correlation		SA	MH
SA	Pearson Correlation	1	.440
	sig.(2-tailed)		.000
	N	257	
MH	Pearson Correlation	.440	1
	Sig.(2-tailed)	.000	
	N	257	257

In **Table no. 18** the first value is the value of Pearson's r-i.e., the correlation of coefficient (.440). Pearson's r varies between +1 and -1, where +1 is a perfect positive correlation, and -1 is a negative correlation. 0 means there is no linear correlation. But in table 4.17 Pearson correlation is .440 which indicates a positive correlation. It means if Smart Phone Addiction increases, Mental Health will improve. The two tailed significance value is .000(<.05) that means the correlation is highly significant. Therefore, **$H_0$4** is rejected and alternative hypothesis is accepted.

$H_0$5: There is no significant relationship between smart phone addiction and study habit.

Table 19: Correlation between Smart Phone Addiction and Study Habit.

Correlations			
		Sum SA	Sum SH
Sum SA	Pearson Correlation	1	-.310**
	Sig. (2-tailed)		.000
	N	257	257
Sum SH	Pearson Correlation	-.310**	1
	Sig. (2-tailed)	.000	
	N	257	257

In **table no. 19** the first value is the value of Pearson's r-i.e., the correlation of coefficient (-.310). Pearson's r varies between +1 and -1, where +1 is a perfect positive correlation, and -1 is a negative correlation. 0 means there is no linear correlation. But in table 4.17 Pearson correlation is -.310 which indicates a negative correlation. It means if the Smart Phone addiction increases, the Study Habit will reduce and vice versa. The two tailed significance value is .000(<.05) that means the correlation is highly significant. Therefore, **$H_0$10** is rejected and alternative hypotheses is accepted.

$H_0$6: There is no significant relationship between mental health and study habit.

Table 20: Correlation between Mental Health and Study Habit.

correlations			
		Sum MH	Sum SH
Sum MH	Pearson Correlation	1	-.370
	Sig. (2-tailed)		.000
	N	257	257
Sum SH	Pearson Correlation	-.370**	1
	Sig. (2-tailed)	.000	
	N	257	257

In **Table no.20** the first value is the value of Pearson's r-i.e., the correlation of coefficient (-.370). Pearson's r varies between +1 and -1, where +1 is a perfect positive correlation, and -1 is a negative correlation. 0 means there is no linear correlation. But in table 4.19 Pearson correlation is -.370 which indicates a negative correlation. It suggests if Mental Health of the higher secondary students improves, their Study Habit will reduce and vice versa. The two tailed significance value is .000(<.05) that means the correlation is highly significant. Therefore, $H_0$11 is rejected and alternative hypotheses is accepted.

$H0_7$: There is no significant impact of Smartphone addiction on the study habit of higher secondary school students.

Table 21: Regression analysis between Smart phone addiction and Study Habit

Hypothesis	**Regression weight**	**R^2**	**Beta Coefficient**	**F**	**p-value**
$H_0$7	SA-SH	.096	-.086	27.199	.000

Interpretation:(Table-21) R^2 means .09% effect on study habit can be accounted for by smart phone addiction. The p value is .000(<.05). It suggests that the impact is significant. Therefore, **$H0_7$** is rejected. Alternative hypothesis is accepted.

$H_0$8: There is no significant impact of Smartphone addiction on the Mental Health of higher secondary school students. Therefore, $H_0$8is rejected and alternative hypotheses is accepted.

Table.22: Regression Analysis between Smart phone Addiction and Mental health.

Hypothesis	**Regression weight**	**R^2**	**Beta Coefficient**	**F**	**p-value**
H08	SA-MH	.194	0.158	61.311	.000

Interpretation: (Table-22) R^2 means 19.4% effect on Mental Health can be accounted for by smart phone addiction. The p value is .000(<.05). It suggests that the impact is significant. Therefore, $H_0$8 is rejected and alternative hypothesis is accepted.

Discussions:

Discussion on smart phone addiction:

- With regard to gender the study shows that smart phone addiction has significant relation with gender and female students are more addicted to smart phone than the male students. It may cause several behavioural problems like sleep disorder, isolation and self-centeredness etc. Male students are less addicted to smart phones implies they prefer going out, spending time with friends rather than being glued to their smart phones.
- The study reveals that rural students are more addicted towards their smart phones than the urban students. It can be said that the urban students are more focused regarding their career, they get less time to use smart phones. On the

other hand, the rural students get less possibility of exposure into the outer world, they try to quench their thirst for the unknown by using smart phones and thereby getting connected to the outer world.

Discussion on Mental Health:

- With regard to gender the study reveals that female students have better mental health than the males. As the females have higher level of smart phone addiction, they remain free from the constraints of stark reality of everyday life, by watching videos, playing games, accessing social networking sites. All these make them feel relaxed.
- With regard to Locale the study shows that Rural students have improved mental health than the urban students. It can be assumed from the above-mentioned fact that rural students are more prone to free mixing, fellow feeling, sharing, spontaneity than the urban students.

Discussion on Study Habit:

With regard to gender, the study reveals that both the male and female students have almost equal level of study habit. It indicates that the study habit of the students does not vary across gender.

With regard to locale the study reveals that both the rural and urban students have same level of study habit. This indicates equal scope of education for boys and girls.

Discussion on Impact Study:

The study reveals that there is an impact of smart phone addiction on study habit. It means study habit gets affected by smart phone addiction. Uncontrolled use of this device should be checked to bring about significant changes in study habit of the students thereby making them realize its harmful consequences.

The study also shows that smart phone addiction has significant impact on mental health. It can cause anxiety, stress, depression and many other problems like isolation, sleep disorder etc. Students should stay away from overuse of smart phone to maintain good mental health.

Discussion on correlation study:

The study brings out that there is a positive correlation between smart phone addiction and mental health. It indicates that if smartphone addiction increases, mental health condition of the students will also improve. As smartphone offers various entertainments, games, access to social networking sites, the students never feel bored. It helps them come out of the routine bound monotony and provides relaxation and entertainment.

The study unfolds that there is a negative correlation between smart phone addiction and study habit. It indicates if smart phone addiction increases, study habit will decrease. If students spend more time over smartphone, they will get less time to study. This will result in poor academic performance.

The study puts forth that there is a negative correlation between mental health and study habit.

This signifies that if mental health of the students improves, their study habit will reduce. When the students will remain free from anxiety, stress etc. they will easily drift towards those things which provides amusement.

5.5: Educational Implication:

The most important contribution of the present study is that it brings into focus the impact of smart phone addiction on the study habit and mental health of higher secondary school students. The outcomes of this study have been found beneficial to school system. The present study tried to measure smart phone addiction, study habit and mental health of higher secondary school students with respect to certain categorical variables and the effect of smart phone addiction on the study habit and mental health of higher secondary school students. The overall findings of the study generate clean idea about smart phone addiction, study habit and mental health of higher secondary school students to researchers and stakeholders of educational field. This finding will have some contribution in education by means of searching whether students should be kept away from using smartphones. Findings shows that smart phone addiction negatively impacts study habits. Therefore, awareness should be spread among the students regarding its' harmful consequences.

5.7: Conclusion of the Study:

We are nowadays living in a globalized era. Internet-based technology has been developed and changed dramatically. A Smartphone is one of the most important technologies enhancing people to connect and communicate easier and faster. However, it also has various drawbacks. It causes health problems, poor family relationship, poor social interaction, and poor academic performance. It also leads to decreased study habit among high school students. To deal with this problem, parents and young people should be acquainted regarding the consequences of using Smartphone through various media channels. Most importantly, the parents themselves should pay more attention to their children by giving them more time and affection.

5.6: Recommendation for Further Study:

- The study is restricted to the Higher secondary schools of Purba Bardhaman district in the state of West Bengal. For these reasons the study does not claim the universal reliability. Therefore, there will be need for cross sectional study of the mentioned result with samples from other districts as well as from other states of India.

➢ The study finds out the significant difference of major variables with respect to certain categorical variables and effect of independent variables on dependent variable. But never try to analyse why such finding arises and what factors make role to develop such findings. So, there is a scope for further descriptive study on research findings of this study.
➢ The study should not remain restricted only to the higher secondary students, there is scope of research on college and university students.
➢ The study does not include the sample from northernmost districts of West Bengal. For this reason, the researchers have a scope to reinvestigate the finding by collecting the sample from all districts of West Bengal.
➢ In this study the significant difference of major variables is measured with respect to two categorical variables such as gender and locale. So, there is a scope for the researcher to elaborate the present study by taking other categorical variables such as stream of study, family type etc. The study does not go for dimension wise analysis and always puts emphasis upon the overall analysis. So, there is a scope for the researcher for further analysis with respect to the dimensions of major variables.
➢ The study only includes the sample from secondary schools and generates new field for further study on other sections of education system i.e., pre-primary schools, primary schools, upper primary schools, colleges and universities. So, there is a scope for the future researchers for further study by taking sample from the other sections of school system.

Bibliography:

Appiah, M. K. (2016). Influence of WhatsApp on study habit of university students in Ghana. International Journal of Research in Economics and Social Sciences, 6(3), 280-292.

Bolle, C. L. (2014). Who is a smartphone addict? The impact of personal factors and type of usage on smartphone addiction in a Dutch population (Master's thesis, University of Twente).

Chaturvedi,K., Vishwakarma, D. K., & Singh, N. (2021). COVID-19 and its impact on education, social life and mental health of students: A survey. Children and youth services review, 121, 105866.

Dasgupta, P., Bhattacherjee, S., Dasgupta, S., Roy, J. K., Mukherjee, A., & Biswas, R. (2017). Nomophobic behaviours among smartphone using medical and engineering students in two colleges of West Bengal. Indian Journal of Public Health, 61(3), 199.

Huckins, J. F., DaSilva, A. W., Wang, W., Hedlund, E., Rogers, C., Nepal, S. K., ... & Campbell, A. T. (2020). Mental health and behaviour of college students during the early phases of the COVID-19 pandemic: Longitudinal smartphone and ecological momentary assessment study. Journal of medical Internet research, 22(6), e20185.

Lutfiani, D. (2018). The use of gadget on students' study habit in English language learning at SMA An-Najiyah Surabaya (Doctoral dissertation, UIN Sunan Ampel Surabaya).

Lai, X., Nie, C., Huang, S., Li, Y., Xin, T., Zhang, C., & Wang, Y. (2022). Effect of growth mindset on mental health two years later: the role of smartphone use. International journal of environmental research and public health, 19(6), 3355.

Mawi, N., Perveen, A., & Hamzah, H. (2019). Mobile Usage, Shopping Behaviour and Study Habit as Contributing Factors of Depression, Anxiety and Stress Among University Students. International Journal of Education, 4(31), 394-408.

Nayak, J. K. (2018). Relationship among smartphone usage, addiction, academic performance and the moderating role of gender: A study of higher education students in India. Computers & Education, 123, 164-173.

Obadara, O. E., & Olaopa, S. O. (2018). Social Media Utilisation, Study Habit and Undergraduate Students' Academic Performance in a University of Education in Nigeria. Library Philosophy and Practice.

Patel, S., D' mello, L., & Shwetha, K. T. (2022). The Association Between Smart Phone Addiction and Psychological Distress Among Adolescents–A Review Based Analysis. International Journal of Research in Engineering, Science and Management, 5(1), 86-90. Subramani Parasuraman,

A. T. S., Yee, S. W. K., Chuon, B. L. C., & Ren, L. Y. (2017). Smartphone usage and increased risk of mobile phone addiction: A concurrent study. International journal of pharmaceutical investigation, 7(3), 125.

Saraswathi, I., Saikarthik, J., Kumar, K. S., Srinivasan, K. M., Ardhanaari, M., & Gunapriya, R.(2020). Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: a prospective longitudinal study. Peer J, 8, e10164.

Tran, D. (2016). Classifying nomophobia as smart-phone addiction disorder. UC Merced Undergraduate Research Journal, 9(1).

Thomée, S. (2018). Mobile phone use and mental health. A review of the research that takes apsychological perspective on exposure. International journal of environmental research and public health, 15(12), 2692.

Smart phone Addiction Scale (www.researchgate.net)

DASS 21 for Mental Health (htps://maic.qld.gov.au)Study Habit Scale (https://people.engr.tamu.edu)