

Relationship between Cognitive Failure and Internet Addiction of Higher Secondary Students of Purulia District of West Bengal: A Study

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Abstract

In the 21st-century internet, addiction has become a common phenomenon among students. Internet addiction is sometimes referred to as internet addiction disorder, pathological internet usage, internet reliance, problematic internet use, overuse and compulsive internet use. And cognitive failure is outlined as the probable consequence of a general failure of the cognitive and control system. The present study has aimed to determine the relationship between cognitive failure and internet addiction of higher secondary students of the Purulia district of West Bengal. For the present study, the researchers have used descriptive survey-type research. The data for the present study has been collected from seventy-eight (78) class XI students from randomly selected two schools in the Purulia district of West Bengal, India, using a simple random sampling technique. The researchers have used appropriate descriptive statistics like mean, standard deviation, correlation and inferential statistics like the Shapiro-Wilk test for normality test, *t*-test and Mann-Whitney U test for data analysis. The result revealed a significant relationship between cognitive failure and internet addiction among higher secondary Purulia district of West Bengal students. However, no significant difference has been observed in cognitive failure and internet addiction regarding gender, location and stream.

Keywords: cognitive failure, internet addiction, higher secondary students

Introduction

Technology has taken a dominant role in nearly every aspect of human life during the last few decades. We are unable to envision a day without technological disruption (Gayen et al., 2021). Technology has already become an integral part of day to day life of human beings. Technology is slowly consuming every sphere of society. Furthermore, not the exception is education. Technology is currently a major component of the education sector. To improve the effectiveness of teaching and learning, teachers are doing everything they can to include technology (Gayen & Sen, 2021). Thus, students are engrossed in the sphere of using the internet in the process of education. The internet has not only entered into the life of each and every individual, but also it has become the driving principle of individuals. The social scientists' concern over the increased rate of internet penetration across all demographic groups is growing. Consuming data and using the internet are not entirely harmful. Rather, it makes life easier and gives us access to numerous distant educational materials (Gorain et al., 2022).

Though the internet has enriched the lifestyle of humans by providing lots of facilities in our day-to-day life, especially in the

field of education, it also has its negative consequences. People are becoming dependent on the internet for each and every activity. The effects of internet dependency on the behavioral, cognitive, and emotional patterns that are initially influenced by biological and environmental factors have been shown to be persuasive (Gorain et al., 2021). In this present situation, people are gradually addicted to the internet, which directly or indirectly affects their life a lot. Virtual addiction, or addiction to the worldwide web, is one of the biggest issues the internet has brought about. This addiction has negative psychological and behavioral impacts on the user (Mohammadkhani et al., 2017). Now the question is, does it result in cognitive failure of individuals? The potential result of a widespread failure in a system of cognitive control is known as a cognitive failure. For instance, when thoughts become scattered as a result of external or internal dispersions, such as nightmares, and attention is drawn away from the current work and onto other stimuli (Algharaibeh, 2017). In this present study, the researcher has wanted to explore the relationship between cognitive failure and internet addiction of higher secondary students of the Purulia district of West Bengal.

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Review of the Related Literature on Cognitive Failure

Iwasa et al. (2021) performed a study on "Factors associated with cognitive failure among mothers involved in child care" to discover factors connected with cognitive failure among mothers who were involved in child care in Japan. The study was conducted on 310 mothers aged 25-45 using a self-reported questionnaire on cognitive failure. The study explored that the number of children, fatigue, emotional support, neuroticism, agreeableness and conscientiousness are the factors associated with the cognitive failures of mothers.

Dzibur et al. (2020) conducted a study on "Understanding Cognitive Failures through Psychosocial Variables in Daily Life of Students" to examine cognitive failures through psychosocial variables in day to day life of students of the University of Sarajevo and also investigated to know the relationship between anxiety and cognitive failures. In a cross-sectional study, 175 first-year students of the University of Sarajevo (92 medical students & 83 psychology students) were involved. Cognitive Failures Questionnaire (CFQ) was employed in the survey and Independent sample testing and Pearson's correlation coefficient were used to get the results (r). The result revealed that consuming alcohol, cigarettes, painkillers, and anxiety were the important causes of cognitive failures.

Tirre (2018) made a study on "Dimensionality and Determinants of Self-Reported Cognitive Failures" to explore the factors of cognitive failures and also to ascertain whether personality traits, general cognitive capacity, and the need for cognition could be used to predict cognitive failures. The Broadbent Cognitive Failures Questionnaire (CFQ), a Big-Five personality assessment, the Abstract Reasoning Test, the Speeded Cognitive Ability Test, and the Need for Cognition survey were all completed by a sample of 552 USAF servicemen. The result showed that one component dominated CFQ responses, according to results from both confirmatory factor analysis and Rasch modeling. According to regression analysis, personality variables were a good predictor of CFQ responses ($R = .60$).

Algharaibeh (2017) conducted a study on "Metacognitive Skills as Predictors of Cognitive Failure" to measure cognitive failure at Qassim University of the Kingdom of Saudi Arabia. Randomly selected 241 female first-year students in the academic year 2016-2017 from Qassim University in the Kingdom of Saudi Arabia were subjected to the cognitive failure questionnaire (CFQ) and the metacognitive skills questionnaire (MCSQ). It was found that these students have a low level of cognitive failure. It was also found that there were statistically significant differences in cognitive failure between scientific and literary colleges. He finally concluded that monitoring and planning were the most predictive skills for cognitive failure among students of the University of Qassim.

Kazemi et al. (2017) performed a study, "A Survey of the Relationship between the Mental Workload and Cognitive Failure in Taxi Drivers 2017," to find out the relationship between the mental workload and cognitive failure in taxi drivers in Shiraz in 2017. A sum of 200 taxi drivers in Shiraz, Iran, participated in this cross-sectional, descriptive-analytical study in 2017. The CFQ cognitive failure questionnaire was employed to measure cognitive failure. The data were statistically analyzed using one-way ANOVA, t -test, and Pearson correlation. The result exhibited that there existed a significant relationship between cognitive failure and the mental workload of taxi drivers.

Unsworth et al. (2012) directed a study on "Variation in cognitive failures: An individual differences investigation of everyday attention and memory failures" to look at individual differences in daily cognitive failures measured by diaries. In the lab, a sizable sample of volunteers underwent several cognitive ability tests. Also, a portion of these participants kept a diary of their regular cognitive slip-ups for a full week. The study discovered significant evidence for both individual differences in daily cognitive failures and the ecological validity of laboratory cognitive ability tests.

Literature Review on Internet Addiction

Topal (2021) performed a study on "Investigation of high school students' internet addiction levels using various variables:

The case of Giresun Province" to know the internet addiction levels of high school students. A number of 962 students (452 females and 410 boys) from various high schools in Giresun participated in the study during the fall semester of the 2019-2020 academic year. The generic survey model was used to collect the research data. Young developed the 20-item Internet Addiction Scale (IAS), which was used. Kolmogorov-Smirnov (K-S), Arithmetic Mean, Standard Deviation, Independent groups t -test, one-way ANOVA, and Tukey analysis methods were utilized to analyze the data. The result showed that in terms of gender, class, economic situation, mother's education level, and father's education level, high school kids' mean scores on measures of internet addiction vary greatly.

Neverkovich et al. (2018) investigated how the internet affected young people negatively from a social, psychological and educational standpoint in their study "Students' Internet Addiction: Study and Prevention." Six hundred and fifty-seven individuals participated in an experimental study, including high school students from secondary schools in Moscow (76) and Irkutsk (102); college students from the Construction College in Kazan (78); the Moscow College of Architecture, Design, and Re-Engineering (82); the Irkutsk State University (113); Sechenov First Moscow State Medical University (112); and Plekhanov Russian University of Economics (95). The findings demonstrated the need for developing and implementing prevention programs for young students who are motivated and cognitive, practice-oriented, and reflexive, as well as a systematic strategy for their implementation in the framework of the educational space.

Menon et al. (2018) conducted a study on "Internet Addiction: A Research Study of College Students in India" to explore the extent of internet addiction in a management institute in India. In this study, 300 students (first, second and third-year students) from an Indian management institution were sampled to determine the prevalence of internet addiction. The Internet Addictions Scale by Young (1998) was used in this study to gauge the extent of online addiction. A methodological survey design was used in the investigation. The result revealed that there is a strong association between age and internet addiction, with older students being more addicted than younger ones. There were notable variations between the sexes in terms of Internet use as well, with men being more addicted than women.

Mohammadkhani et al. (2017) conducted a study on "Internet Addiction in High School Students and Its Relationship with the Symptoms of Mental Disorders" to examine internet addiction and its relationship with the symptoms of mental disorders. The design of this study was descriptive and correlational. Five high school students from the Tehran district from the academic year 2013-2014 were randomly chosen into a sample of 400 participants for the study utilizing the cluster sampling method. The Internet Addiction Test and the Brief Symptom Inventory were used to gather data, and the T-Test, Pearson Correlation Coefficient, and multiple regression analysis were employed to analyze the results. The study explored that internet addiction factors and symptoms of mental disorders are significantly positively correlated, and independent variables of psychosis and anxiety from the symptoms of mental illnesses had a substantial impact on Internet addiction.

Kuss et al. (2013) conducted a study on "Internet addiction in students: Prevalence and risk factors" to know the addictive chance of internet addiction on personality. A sum of 2,257 students from an English university provided information for the cross-sectional online survey. Emails with details about the study and a link to the online survey were sent to each student's home email address. The result revealed that while online gaming and openness to new experiences increased the likelihood of internet addiction, online shopping and neuroticism decreased it. Moreover, frequent online shopping and socializing, high neuroticism, and low agreeableness all significantly enhanced the likelihood of developing an internet addiction.

Objectives

1. To study the relationship between cognitive failure and internet addiction of higher secondary students.

2. To identify the difference in cognitive failure of higher secondary students in regard to gender, location and stream.
3. To identify the difference in internet addiction of higher secondary students in regard to gender, location and stream.

Hypotheses

- Hypothesis 1. There is no significant relationship between cognitive failure and internet addiction in higher secondary students.
- Hypothesis 2. There is no significant difference in cognitive failure between boys and girls in higher secondary students.
- Hypothesis 3. There is no significant difference in cognitive failure between rural and urban higher secondary students.
- Hypothesis 4. There is no significant difference in cognitive failure between arts and science higher secondary students.
- Hypothesis 5. There is no significant difference in internet addiction between boys and girls in higher secondary students.
- Hypothesis 6. There is no significant difference in internet addiction between rural and urban higher secondary students.
- Hypothesis 7. There is no significant difference in internet addiction between arts and science higher secondary students.

Methodology

Design

For the present study, the researchers have adopted descriptive survey-type research.

Population

All the higher secondary students (both class XI & XII) of the Purulia district of West Bengal, India, have been considered as the population for the present study by the researchers.

Sample & Sampling Technique

The data for the present study has been collected from seventy-eight (78) students of class XI from randomly selected two schools in the Purulia district of West Bengal, India, using a simple random sampling technique.

Scale Used

Researchers have used "The Cognitive Failure Questionnaire" by Broadbent et al. (1982) and "The Internet Addiction Test (IAT)" by Dr. Kimberly S. Young (1998) for the collection of data.

Table 3

Descriptive Statistics along with the 't' value of Cognitive Failure for Boy and Girl, Rural and Urban, and Arts and Science Students of Higher Secondary Schools of Purulia District of West Bengal

Pair of comparison	n	M	SD	MD	df	Calculated 't' value	Critical 't' value	Remarks
Boys	26	44.73	14.94	2.23	76	.74	2.01 (.05) & 2.68 (.01)	Not significant
Girls	52	42.50	11.34					
Rural	48	43.40	11.65	.40	76	.13	2.01 (.05) & 2.68 (.01)	Not significant
Urban	30	43.00	14.19					
Arts	50	42.28	12.40	2.68	76	.90	2.01 (.05) & 2.68 (.01)	Not significant
Science	28	44.96	12.99					

Note. N = 78. MD = mean difference.

Table 3 shows that the mean score of cognitive failure of boy and girl, rural and urban & arts and science students of higher secondary schools of Purulia district of West Bengal are 44.73 and 42.50, 43.40 and 43.00 & 42.28 and 44.96, respectively with mean difference 2.23, .40 and 2.68. The standard deviations are 14.94 and 11.34, 11.65 and 14.19 & 12.40 and 12.99, respectively. The calculated 't' value for boy and girl, rural and urban & arts and science students are .74, .13 and .90 respectively which are less than that of the critical 't' value for

Statistics Used

For the present study, the researchers have used appropriate descriptive statistics like mean, standard deviation, correlation and inferential statistics like the Shapiro-Wilk test for normality test, 't'-test and Mann-Whitney U test.

Results

Table 1

Test of Normality of Cognitive Failure and Internet Addiction of Higher Secondary Students of Purulia District of West Bengal

Variable	Shapiro-Wilk		
	Statistic	df	Sig.
Cognitive failure	.98	78	.28
Internet addiction	.96	78	.02

The researcher has tested the normality of data on cognitive failure and internet addiction. The result of the test shows that the significance of cognitive failure and internet addiction in the Shapiro-Wilk test is .28 and .02, respectively. Thus, the significance of cognitive failure is greater than .05, but the significance of internet addiction is less than .05. So, the data on cognitive failure is normality distributed, whereas the data on internet addiction is not normality distributed.

Table 2

Correlations between Cognitive Failure and Internet Addiction of Higher Secondary Students of Purulia District of West Bengal

Variable	Correlations	CF	IA
Cognitive failure	Pearson correlation	1	.27*
	Sig. (2-tailed)		.02
Internet addiction	Pearson correlation	.27*	1
	Sig. (2-tailed)	.02	

Note. N = 78. CF = Cognitive failure; IA = Internet addiction.

Table 2, it is found that the value of the coefficient of correlation is .27, which is significant at a .05 level of significance. So, a significant relationship is found between cognitive failure and internet addiction in students of higher secondary schools in the Purulia district of West Bengal. So, the null hypothesis (H₀₁), "There is no significant relationship between cognitive failure and internet addiction of higher secondary students," stands rejected.

the degree of freedom 76. So, the calculated 't' values are not significant at the .01 level of significance.

Results revealed no significant difference in cognitive failure between boy and girl students of higher secondary schools in the Purulia district of West Bengal. So, the null hypothesis (H₀₂), "There is no significant difference in cognitive failure between boy and girl higher secondary students," is retained.

Results revealed no significant difference in cognitive failure between rural and urban students of higher secondary schools in

the Purulia district of West Bengal. So, the null hypothesis (H₀₃), "There is no significant difference in cognitive failure between rural and urban higher secondary students," is retained. Results revealed no significant difference in cognitive failure between arts

and science students of higher secondary schools in the Purulia district of West Bengal. So, the null hypothesis (H₀₄), "There is no significant difference in cognitive failure between arts and science higher secondary students," is retained.

Table 4

Mann Whitney U Test of Internet Addiction between Boy and Girl, Rural and Urban, and Arts and Science Students of Higher Secondary Schools of Purulia District of West Bengal

Internet addiction	n	M	Sig.	Decision
Boys	26	40.58	.21	Retain the null hypothesis
Girls	52	34.56		
Rural	48	34.04	1.00	Retain the null hypothesis
Urban	30	40.60		
Arts	50	38.06	.23	Retain the null hypothesis
Science	28	33.89		

Note. N = 78.

In table 4, the mean of Internet Addiction of students of higher secondary schools in the Purulia district of West Bengal shows that the mean value for boy and girl students are 40.48 and 34.56; rural and urban students are 34.04 and 40.60, arts and science students are 38.06 and 33.89 respectively. From the .05 level of significance, calculated *p* values for boy and girl, rural and urban & arts and science students are .21, 1.00 and .23, respectively, are statistically not significant at *p* < .05.

The result reflected no significant difference between boy and girl students of higher secondary schools in the Purulia district of West Bengal. Therefore, the null hypothesis (H₀₅), "There is no significant difference in Internet Addiction between boy and girl higher secondary students," is retained.

The result reflected no significant difference between rural and urban students of higher secondary schools in the Purulia district of West Bengal. Therefore, the null hypothesis (H₀₆), "There is no significant difference in Internet Addiction between rural and urban higher secondary students," is retained.

The result reflected no significant difference between arts and science students of higher secondary schools in the Purulia district of West Bengal. Therefore, the null hypothesis (H₀₇), "There is no significant difference in Internet Addiction between arts and science higher secondary students," is retained.

Major Findings

1. A significant relationship has been found between cognitive failure and internet addiction in higher secondary students of the Purulia district of West Bengal. Internet addiction in higher secondary students resulted in cognitive failure of them.
2. Both the boy and girl higher secondary students of the Purulia district of West Bengal are quite equal in terms of cognitive failure. No significant difference has been observed between them.
3. Both the rural and urban higher secondary students of the Purulia district of West Bengal are also quite equal in terms of cognitive failure. No significant difference has been observed between them.
4. Both the arts and science higher secondary students of the Purulia district of West Bengal are also quite equal in terms of cognitive failure. No significant difference has been observed between them.
5. Both the boy and girl higher secondary students of the Purulia district of West Bengal are quite equal in terms of internet addiction. No significant difference has been observed between them.
6. Both the rural and urban higher secondary students of the Purulia district of West Bengal are also quite equal in terms of internet addiction. No significant difference has been observed between them.
7. Both the arts and science higher secondary students of the Purulia district of West Bengal are also quite equal in terms of internet addiction. No significant difference has been observed between them.

Discussion

The results of the study showed a significant positive correlation between cognitive failure and internet addiction, indicating that higher levels of cognitive failure are associated with higher levels of internet addiction. The findings of the study are consistent with previous research like Rezaul Karim and Nigar (2014), who have found a similar relationship between cognitive failure and internet addiction among university students in Bangladesh. Another study conducted by Ozcan and Buzlu (2017) found a significant relationship between cognitive failure and internet addiction among Turkish university students. In this study, the researchers revealed that there are no significant differences in Internet Addiction between boys and girls, arts and science, and rural and urban. In addition, the same result has been found of the above three pairs in this study in the cognitive failure of higher secondary school students of the Purulia district of West Bengal. But some of the studies found that the significant differences in cognitive failure and internet addiction between male and female students may be due to differences in gender socialization and cultural factors. Male students may have more access to the internet and may spend more time online due to their greater freedom and autonomy compared to female students. In addition, male students may be more prone to engaging in risky behaviors such as internet addiction, as these behaviors are often seen as more socially acceptable for males. In addition, some studies revealed that the causes of cognitive failure are consuming alcohol, cigarettes, painkillers, and anxiety were the important (Dzubur et al., 2020)) and monitoring and planning were the most predictive skills for cognitive failure (Algharaibeh, 2017)). Some studies also found significant differences in cognitive failure and internet addiction based on the academic stream chosen by the students. The mean scores of cognitive failure and internet addiction were found to be higher among students from the science stream as compared to the arts and commerce streams. This finding could be attributed to the higher academic pressure and workload among science students, leading to higher levels of cognitive failure and internet addiction.

Conclusion

The internet has altered the life of human civilization where people are more connected to the internet than individuals and thus, internet addiction has become the angst of modern-day people. The present study revealed that internet addiction is significantly related to the cognitive failure of people. But both cognitive failure and internet addiction has no difference in terms of gender, location of resident and stream of people. Those who become addicted to the internet suffer unpleasant consequences. Because prevention is preferable to treatment and in light of the findings of this study, it is important to consider this phenomenon as a psychological issue that frequently affects the younger generation, who are in charge of building the future of society. Through education in families, schools, and universities, the

culture of proper computer use, in particular the internet and its resources, should be replaced with false methods.

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