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COGNITIVE FAILURES AND INTERNET ADDICTION AMONG UNIVERSITY STUDENTS: AN EXPLORATORY STUDY

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ABSTRACT

The objective of the present study was to explore the relationship between cognitive failure and internet addiction. After detailed literature review, it was hypothesized that (1) There would be significant difference in mean scores of normal internet users and different levels of dependant internet users on the variable of cognitive failures; (2) There would be positive correlation between age and internet addiction; and (3) There would be positive correlation among age and number of internet usage hours. The sample of the current study comprised of 334 participants (182 men and 152 women) with age ranging from 18-28 years approached from different educational institutes of Karachi, with minimum education requirement of intermediate. Minimum requirement for internet usage was at least one hour daily for last six months. Research measures employed were: Demographic Information sheet, Internet Addiction Test (IAT) (Young, 1998a) to classify internet users, and Cognitive Failures Questionnaire (CFQ) (Broadbent, Cooper, FitzGerald, & Parkes, 1982). Results indicate statistically significant differences among the Normal internet users and Mild, Moderate and Severe dependant internet users on the variable of cognitive

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failures [F (3,330) = 12.140, p<.001]. Further significant positive correlations were found between Age and Internet Addiction [r(332)=.190, *p*<.001]; *and age and number of daily Internet hours usage [r(334)=.272, p<.001].*

Keywords: Internet, addiction, cognitive failures, age

INTRODUCTION

Technological advancements have transformed our labor oriented world into convenience and luxuries. One of such technological revolutions is the technology of internet which has converted the world into a global village. Information, entertainment, communication, business and what not are part of internet technology which is expanding every day. The technology of internet along with its various utilities and merits is questioned today due to its addictive potentials which have disturbed people's lives. A number of studies are conducted in different Asian (e.g. Suhail & Bargees, 2006; Chou, 2001) and European (e.g. Ferraro, Caci, D'Amico, & Di Blasi, 2007; Niemz, Griffiths, & Banyard, 2005) countries to investigate different aspects of internet addiction. Neurological abnormalities (Yuan, Qin, Liu, & Tian, 2011), psychological issues, relational problems and academic/ professional disturbances are to name a few of its demerits (Young, 1998b).

Memory and attention lapses called cognitive failures are common occurrence in daily living. Normally these contribute to minor problems like short time loss in searching things in plain view, forgetting to pick up things in supermarkets etc. However these lapses can also have major life threatening consequences like road accidents, surgery mistakes etc. Thus an apparently minor problems in basic cognitive process of memory and attention can have potentially numerous and threatening consequences (Carriere, Cheyne, & Smilek, 2008).

Internet destroys the distinction between the reality and representation resulting in loss of sense of reality. This creates a constant confusion in discrimination of reality which leads to insecurity, disagreement and loss of meaning. Internet negatively effects learning and cognitive development by providing associations as compared to discursive model of knowledge. This results in copy paste mentality which inhibits autonomous production of knowledge. It also limits the attention span of cognitive processes by inhibiting the critical appraisal of information (Brey, 2006).

Cognitive failures have not been directly studied yet with reference to internet addiction. However few studies of internet addiction have pointed out some common factors that might contribute towards cognitive failures, like impulsivity (Cao, Su, Liu, & Gao, 2007), micro-structural brain abnormalities (Yuan et al., 2011), sleep deprivation (Collier, 2009), stress and anxiety (Akin & İskender, 2011), depression (Young & Rogers, 1998), inattention and hyperactivity (Yoo, Cho, Ha, Yune, Kim, Hwang, et al., 2004) and memory problems (Yuan et al., 2011). These studies provide a basis to explore the cognitive failures with reference to internet addiction.

Internet addiction also varies along different age groups. Researches indicate that young people are most vulnerable group which is effecting their functioning greatly with reference to academics, personal/social and careers (Cao et al., 2007, Chou, 2001, İskender & Akin, 2010 etc.). So keeping in mind the hazards of internet addiction and cognitive failures there is a need to understand the link between these two variables to devise preventive methods to control its effects on students. Further, there is a dearth of studies on cognitive failures with reference to internet addiction. In this way, the current study is an attempt to fill the knowledge gap in this area. Therefore this study will aim at exploring the connection between internet addiction and cognitive failures.

Keeping in view the above mentioned perspectives following hypothesis was framed for the current study 1) there would be significant difference in mean scores of normal internet users and different levels of dependant internet users on the variable of cognitive failures. Additionally it was also hypothesized that 2) there would be positive correlation between age and internet addiction; 3) there would be positive correlation among age and number of internet usage hours.

METHOD

Participants

A purposive sampling technique was used. The total sample of the current study comprised of 334 participants including 182 men and 152 women. The age of participants ranged from 18-28 years. They were approached from different educational institutes of Karachi with qualification of intermediate or higher and were regular students continuing their studies in colleges or universities. The sample was selected of only those students who were using

internet daily at least for one hour or more, for last six months. They were all unmarried and belonged to middle socioeconomic class.

Measures

Basic Demographic Information Sheet

It consisted of basic demographic information including gender, age, grade level and number of internet usage hours per day.

Internet Addiction Test (Young, 1998)

The Internet Addiction Test (IAT) is a self reported measure that taps the existence and the severity of dependency over internet among adults. IAT is a 20-item questionnaire that is rated on 5 point Likert-scale i.e. Rarely, Occasionally, Frequently, Often, Always ranging from 0=less extreme behavior to 5=most extreme behavior. The total score on IAT can range from 20-100 with higher score representing the higher level of severity of Internet compulsivity and addiction. The scores of the IAT can also be used to classify the participants into one of the four different category of Internet use; the score of 20-30 indicates normal Internet user, 31-49 indicates mild dependent Internet user, 50-79 indicates moderate dependent Internet user and 80-100 indicate severe dependent Internet user. The IAT is a reliable and valid instrument for measuring internet addiction. It shows satisfactory test-retest reliability, good internal consistency and concurrent validity (Cronbach's alphas ranged from .54 to .82).

The Cognitive Failures Questionnaire (Broadbent et al., 1982)

Cognitive failure Questionnaire (CFQ) is a self report questionnaire which measures cognitive failures in a person. It comprises of twenty five questions asking of minor mistakes which everyone makes from time to time, but some of which happen more often than others. It is scored on 5 point likert Scale i.e. never, very rarely, occasionally, quite often and very often, ranging from 0=less extreme behavior to 5=most extreme behavior. The scores can range from 0-100 which means higher the scores, the higher incidence of cognitive failures. CFQ items tend to be positively correlated within the questionnaire indicating internal consistency. CFQ also correlates with other measures of deficits in memory, absent mindedness or action slips. CFQ score measures trait, rather just a state as its remains stable over a long period of time and does not changes with

stress exposure to any person. However the questionnaire is weakly correlated with social desirability and neuroticism. The Cognitive Failures Questionnaire has high internal validity (alpha=0.91) and is stable over long periods of time, with a test-retest reliability rate of .82.

Procedure

Initially the administrators of different educational institutes were approached for collection of data on student sample. After formal approval, students were approached individually on the basis of the research criteria. They were explained the purpose of research and after their verbal approval they were briefed about the procedure of the research. Further they were also informed about their rights as research participants and their right to withdraw from the research at any moment. Then they were asked to sign the written consent form of the research before administration of scales. Afterwards, they were required to fill in demographic sheet along with Internet Addiction Test (Young, 1998), and The Cognitive Failures Questionnaire (Broadbent et al., 1982). During the administration of self reported inventories they were allowed to ask any questions regarding scales if they need clarity or were not able to understand the items in the questionnaires.

Scoring and Statistical Analysis

The scales Internet Addiction Test (Young, 1998), and Cognitive Failures Questionnaire (Broadbent et al., 1982), were scored according to their individual standard scoring procedures. To compile and conclude the research results in quantitative terminology, Statistical Package for Social Sciences (SPSS, V-20.0) was used for statistical analysis and interpretation of the data. Hypothesis testing was conducted using the One way analysis of variance (ANOVA), Post Hoc Tukey's HSD Analysis and Pearson's Correlation for the present study. For ANOVA, participants were divided into different group of internet users, based on their scores on IAT.

RESULTS

Table 1
Descriptive Statistics of various internet users groups and Summary of Analysis of Variance for the variable of Cognitive Failures on various groups of internet users (N=334)

Internet Users	*N*	Mean	Std. Deviation	Std. Error	F	df
Normal	36	39.14	14.351	2.392	12.140**	3, 330
Mild Dependant	112	38.22	13.731	1.297		
Moderate Dependant	127	45.20	13.541	1.202		
Severe Dependant	59	33.32	11.059	1.440		
Total	334	40.11	13.946	.763		

Note. ** p<.001

Descriptive statistics indicate means of normal internet users (*M*=39.14), Mild dependant internet users (*M* =38.22), Moderate dependant internet users (*M* =45.20) and severe dependant internet users (*M* =33.32) on the variable of cognitive failures. Analysis indicated statistically significant differences among the normal internet users and mild, moderate and severe dependant internet users on the variable of cognitive failures [F (3,330) = 12.140, p<.001].

Table 2
Post Hoc Tukey's HSD Analysis among various groups of Internet users on the variable of Cognitive Failures

Group 1	Group 2	Mean Difference	Std. Error	Sig.
Normal	Mild Dependant	.916	2.547	.984
	Moderate Dependant	6.058	2.510	.077
	Severe Dependant	5.817	2.812	.166
Mild Dependant	Moderate Dependant	6.974*	1.723	.000
	Severe Dependant	4.901	2.139	.102
Moderate Dependant	Severe Dependant	11.875*	2.095	.000

* *P*< 0.001

Post hoc Tukey's HSD Analysis indicated that moderate dependant Internet user group significantly differ with mild dependant internet users (6.974, $p<.001$) and severe dependant internet users (11.875, $p<.001$) on the variable of cognitive failures. It is indicative of highest cognitive failures in moderate dependant internet users.

Table 3
Descriptive statistics including mean and standard deviations of various research variables

	N	Mean	Std. Deviation
Age	334	22.20	2.250
Internet Addiction	334	54.96	20.487
Internet Hours	334	4.78	2.895
Cognitive Failures	334	40.11	13.946

Descriptive statistics indicate Mean of sample Age (M =22.20), Internet Addiction (M =54.96), Internet Hours (M =4.78) and Cognitive Failures (M =40.11).

Table 4
Correlations between Age, Internet Addiction, Internet Hours and Cognitive Failures (N=334)

	Age	Internet addiction	Internet Hours	Cognitive Failures
Age	-	.190**	.272**	-.096
Internet addiction			.600**	-.067
Internet Hours				-.080

** p< .001

Table 4 shows significant positive correlations between Age and Internet Addiction, Age and Internet Hours and Internet Addiction and Internet Hours. However no significant relationship was found between Cognitive Failures and other research variables.

DISCUSSION

Internet has taken the world by storm and once a normal usage has now converted into an uncontrollable and unstoppable addiction formally named as Internet Addiction (Young, 1998a). Cognitive Failure was studied with the perspective of internet addiction in the present research. Significant mean differences were found between the different Internet Addiction groups on the variable of Cognitive failures. The results indicate that cognitive failures tend to increase with the progression of internet addiction from normal usage to mild and moderate dependant usage. Highest mean was obtained for the moderate dependant internet users. It can be due to the reasons that in the beginning stages of addiction people try to manage their addiction and daily life. However with increasing dependency people find it difficult to manage, which creates a burden on their cognitive functioning. This in turn may create stress and confusion and may inhibit their cognitive functioning gradually (Rinn, Desai, Rosenblatt, & Gastfriend, 2002; Tokunaga & Rains, 2010; Ko et al., 2009). However interestingly cognitive failures mean score tend to decline drastically in the severe dependant internet users. It may be due to the reason that when a person is overly involved in internet addiction he is concerned only of online activities and almost cuts off from daily routine activities (Chou & Hsiao, 2000; Yellowlees & Marks, 2007), which can result in less cognitive lapses in daily life activities.

Another important aspect was found that Internet addictions tend to be positively correlated with age which means the higher the age the higher the level of addiction. Further age also positively correlated with the maximum number of internet hours a person uses. This indicates that higher age groups are more addicted to internet. The age group in this study comprised of university student population. The university students are now expected to indulge in research work and projects which requires an active internet connection. When use of internet is legalized by the educational system, parental influence tends to decrease and students are allowed to use unlimited internet for their work. Once they are online, the temptations are overwhelming to indulge in chatrooms, instant messaging, shopping, playing games, viewing pornography, or simply browsing the web (Perring, 2005). Students who are continuously surfing the internet for academic purpose, gets "pop-up" advertisements for gaming or gambling sites (Messerlian, Byrne, & Derevensky, 2004). For many of them, it is difficult to curb their desire and average productive time spent on internet decreases. Further

students are provided with unlimited access to internet via different convenient and affordable packages which further encourages them for misuse.

Keeping in view the results of the present study, we can conclude that students suffering from internet addiction are prone towards developing cognitive failures which can seriously hamper their performance. We can also see that the age of the student tends to play an important role in this. As this study is based on self report inventories there might be some chances of faking good or faking bad responses which might have affected the findings, so the results could be validated through other research methodologies. This was an exploratory study which opened door to this new piece of knowledge however it needs to be studied further with different populations and various cultural backgrounds.

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