AN ASSOCIATION OF INTERNET ADDICTION AND PROCRASTINATION AND ITS EFFECTS ON COGNITIVE PROCESSES AMONG ADULTS

Dr. Sonya Arshad[*1], Dr. Muhammad Faisal Qureshi [2], Dr. Farzeen Ali[3], Dr. Misha Tariq[4], Dr. Rutaba Kashaf[5], Dr. Sidra Sadiq[6], Dr. Hasan Abbas Rizvi[7], Sumaiya Nadeem[8]

[*1]*Assistant Professor, Liaquat National School of Physiotherapy*
[2]*Senior Lecturer II, Liaquat National School of Physiotherapy*
[3,4,5, 6,8]*Liaquat National School of Physiotherapy*
[7]*Associate Professor/Principal Liaquat National School of Physiotherapy*

[*1]sonya.arshad@lnh.edu.pk, [2]faisalqureshipt@gmail.com, [3]farzeen_ali@live.com, [4]mishatariq22@gmail.com, [5]rataba.kashaf.12@gmail.com, [6]sidra.sadiq97@gmail.com, [7]hasan.abbas@lnh.edu.pk, [8]sumaiyanadeem24@gmail.com

Corresponding Author: *

ABSTRACT
This study was proposed to examine the association of internet addiction, procrastination and cognitive functions among adults. Internet the facilitator of all; now being used excessively has led to addiction without its conscious awareness and detrimental effects on mental well-being. Internet addiction is characterized by excessive or reckless internet use, which evidently increases distress, academic procrastination, depression, anxiety, negative impact on personality and suicide ideation among students. The requirement of quantitative assessment is deemed necessary to determine effects of internet's addiction on impaired cognitive processes.

INTRODUCTION

A cross-section study was conducted through convenience-based sampling on 636 participants of both genders, aged between 18-55 years. A semi structured questionnaire was designed comprising of participant's voluntary consent, demographics and information regarding internet usage. Internet addiction's severity was assessed by Young's Internet addiction test (IAT) and cognitive function through Montreal Cognitive Assessment Scale (MoCA).data analyzed by using SPSS-21

Out of 636 participants, 230 were males (36.2%) and 406 females (63.8%). Frequency of IAT scores described moderate (75.5%) and severe (3.8%) internet addiction whereas MoCA reported 90.4% cognitive impairment among the participants. Chi square was applied to determine the association: 68.7% had cognitive impairment and moderate

internet addiction while only 0.9% had no addiction nor cognitive impairment.

Internet addicts showed statistically significant results with procrastination (p .002) and cognitive failure (p .000).

Our study concluded that moderate to severe internet addiction leads to cognitive impairment. It is obligatory for us to determine our compulsive internet use so that we can minimize its adversative effects.

An Association of Internet Addiction and Procrastination and its effects on Cognitive Processes Among Adults

Internet the facilitator of all finally declared problematic. Problematic enough to make you want to take your own life. Among Taiwanese adolescents 18.03% participants reported suicidal ideation and

5.74% reported suicidal attempt which were significantly linked to internet addiction (1). One's healthy marriage is shambled when internet meddles with responsibilities and relationships. A surge in divorce rate has been associated with internet (2). Lower grades, difficulty in learning and academic complications were faced by students who spent excessive time on internet (3). Decreased employee productivity is another factor that the internet is accountable for. 77% of the employees were engaged in non-business-related ventures and checked online websites while at work, culminating in a productivity loss of 1.5% (4). Having to deal with daily cognitive failures like wandering into a room and forgetting why you were there for or searching for objects in plain sight getting burdensome. Forgetfulness and deficit in concentration like these come in the form of memory and attention lapses which are reported due to internet addiction. Neuroscience studies claim that in problematic Internet users, the frontal area is under-active especially in those with impaired self-control and decision -making abilities. This strengthens the relation of internet addiction's association with impulsivity. Additionally, the volume of grey matter in the right frontal pole was found to have a significant negative relationship with internet addiction scores (5).

Initially the term "addiction" was applicable for ingestion and absorption of a physical substance (6). Lately addiction has evolved to a broader range encompassing: gambling, overeating, video gaming, binge watching, exercising and immoderate internet use (6). Ivan Goldberg coined the term "internet addiction" as a generic label to characterize excessive internet usage (7). This addiction is mainly portrayed as pathological internet use which characterized as a person's inability to manage their internet utilization. Pathological internet use was seen as most similar to pathological nature of gambling in the DSM-IV (6). Preoccupation, mood modulation, withdrawal and functional disablement are all feature gambling and internet addiction shares (8). In words Internet addiction is identified as an impulse control disorder (8). Along with impulsivity internet addicts are at risk for suffering from a comorbid psychiatric disorder namely ADHD (8, 9). Reasons being engaging in activities without planning, immoderate activities and low level of frustration tolerance (10). Higher self-reported ADHD symptoms were observed in teenagers who indulged in online gaming and console gaming which coincides with internet addiction (9).

Depression is a psychological disorder associated with pathological internet use (9, 11) along with the depressive phase of bipolar disorder (6). Depression is caused by unfortunate occurrence in one's life which functions as a triggering factor for addictive behavior in order to provide a psychological escape from unfavorable thoughts and feelings for the time being (6). The same principles apply to internet addiction, with triggering or signals leading to "net binges" (6). When a person lacks contentment in their life, they are predisposed to addiction (6). Since internet addiction has a detrimental impact on psychological wellness, adolescents who scored higher on the Chen Internet Addiction Scale reported higher depression levels (9). On the other side, the internet provides as a "security blanket" (6), assisting in the establishment of a "virtual self" that enables one to turn off the real world (9). People are increasingly turning to the internet as a less toxic and more accessible form of escapism.

Consequently, if depression and the coping behaviors that accompany it are not treated, internet addiction will intensify (9). In addition to depression, self-esteem has been proven to have a substantial impact on the intensity of obsessive internet use since people with low self-esteem have an addictive nature and lack control (12). Big Five Personality traits mainly a neurotic tend to be more inclined towards internet addiction as they are predisposed to depression with emotional instability and have low self-esteem, which evidently correlates to internet addiction (11). Anxiety is thought to play a role in compulsive internet use as well (12, 13). The toxicity and potency of problematic internet use outreach our approach. Furthermore, procrastination is another harmful element which is sheltered by the umbrella of internet addiction (14, 15). 50% of the students procrastinate due to compulsive internet use (15). The term "procrastination" refers to the process of delay or dysfunctional delay (16) or to postpone your work until the next day (17). 20-25% of the general population is affected by this unhealthy behavior that disrupts people's lives in numerous situations (17). This unhealthy circumstance can remain throughout one's life making procrastination a personality trait (8, 17). Speaking of personality, increased

procrastination is attributed with a decline in conscientiousness and a spike in neuroticism (16).

Although there are different types of procrastinations but the most apparent is academic procrastination (17) with a higher prevalence of 70% and it is associated with poor academic performance (16). University students tends to procrastinate more (16) they are at vulnerability of cultivating internet addiction (7), consequently a positive correlation between internet addiction and procrastination is reported among students (7, 15). Students who procrastinate frequently are less likely to achieve their academic objectives and are disorganized (14).

Although one might assume that substandard academic performance due to procrastination is attributed to a lack of intellectual ability but no significant relationship between intelligence and procrastination has been discovered yet (16). Antagonistically, no significant connection was discovered between internet use and academic procrastination in study conducted by H. Odaci (2010) (18).
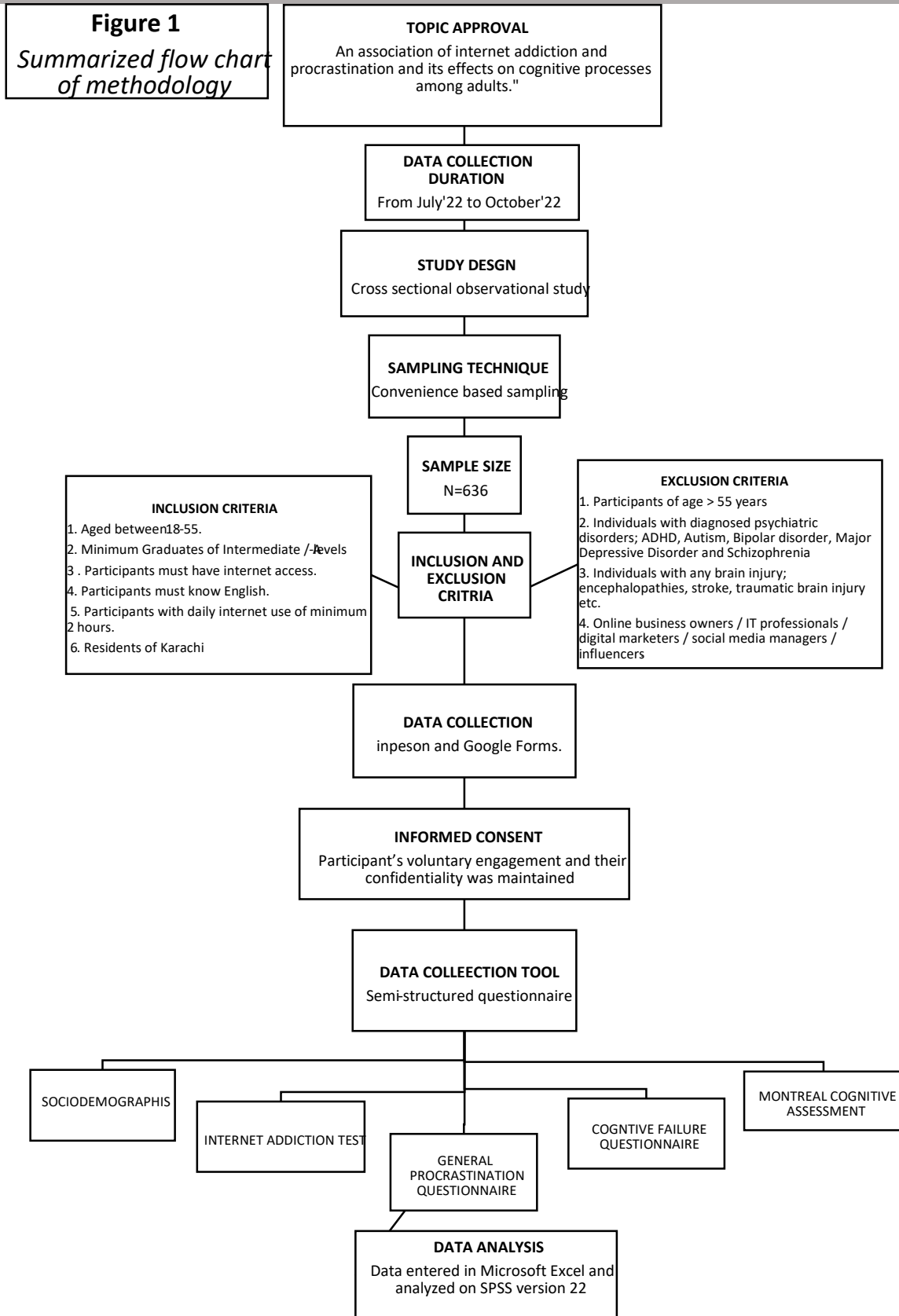
Procrastination has its own set of drawbacks like failure in time management, emotional sacrifices, cognitive and behavioral variables (19). Procrastinators lack the proactive coping skills and strategic planning skills as it requires creating goal-oriented schedule by breaking down larger activities into smaller portions to make them more doable. Procrastinators are primarily concerned with the short-term gains of delaying their activities and abandoning the long-term consequences (20). People who procrastinate frequently tend to be less emotionally intelligent (21) and they suffer from depression and anxiety as well (7, 16).

The vicious cycle of internet addiction and procrastination is unmistakable (15). Some common characteristics can be used to describe this phenomenality. ADHD is noticeable in people who procrastinate (10) and use internet excessively (8). Neurotic personality is a strong predictor of internet addiction (15) and increased procrastination (16). Low self-esteem was found in both individuals who procrastinate (16) and are addicted to internet (12). Thus, internet addiction and procrastination could be identified on their basis of shared traits. Additionally, as employee's (4) and university student's (16) internet addiction hampers their performance (4) with procrastination, it is imperative for educational institutions and organization to identify these factors and develop strategies which will help the individuals to engage in purposeful activities (21).

Research have tremendously explored the personal, social, or emotional aspects of internet addiction, but only a few have looked at the correlation of cognitive functioning and excessive internet use. Xanidis and Brignell (2016) discovered that resilience on social networking platforms were closely related to increased everyday cognitive failures. Cognitive failure develops as internet addiction progresses from regular to mild and moderate usage (4). Surprisingly, countless negative characteristics and consequences of pathological internet use are disclosed. Unfortunately, there are still some which are yet to be fully discover; mild cognitive impairment is one of them (5, 22).

Figure 1

Summarized flow chart of methodology

TOPIC APPROVAL

An association of internet addiction and procrastination and its effects on cognitive processes among adults."

DATA COLLECTION DURATION

From July'22 to October'22

STUDY DESGN

Cross sectional observational study

SAMPLING TECHNIQUE

Convenience based sampling

SAMPLE SIZE

N=636

INCLUSION CRITERIA

1. Aged between18-55.
2. Minimum Graduates of Intermediate /-Ievels
3 . Participants must have internet access.
4. Participants must know English.
5. Participants with daily internet use of minimum 2 hours.
6. Residents of Karachi

INCLUSION AND EXCLUSION CRITRIA

EXCLUSION CRITERIA

1. Participants of age > 55 years
2. Individuals with diagnosed psychiatric disorders; ADHD, Autism, Bipolar disorder, Major Depressive Disorder and Schizophrenia
3. Individuals with any brain injury; encephalopathies, stroke, traumatic brain injury etc.
4. Online business owners / IT professionals / digital marketers / social media managers / influencers

DATA COLLECTION

inpeson and Google Forms.

INFORMED CONSENT

Participant's voluntary engagement and their confidentiality was maintained

DATA COLLEECTION TOOL

Semi-structured questionnaire

SOCIODEMOGRAPHIS

INTERNET ADDICTION TEST

GENERAL PROCRASTINATION QUESTIONNAIRE

COGNTIVE FAILURE QUESTIONNAIRE

MONTREAL COGNITIVE ASSESSMENT

DATA ANALYSIS

Data entered in Microsoft Excel and analyzed on SPSS version 22

Methodology

STUDY DESIGN AND PARTICIPANTS

The present study is an observational cross -sectional study, conducted in the time frame of 15th March 2022 till 15th December, 2022. Sample size was estimated from the software Open Epi with an anticipated population Sample proportion of 50% (33.4%), confidence level of 95% and bound on error of 5%, a sample size of 385 was calculated. The sample size was increased to 636 to reduce the margin of error and make results more generalized. The sample was collected from different hospitals, universities and offices of Karachi. Referee to figure 1 for summarized methodology

TOOLS AND MEASUREMENETS

Tool for data collection was a semi structured questionnaire which comprised of two parts. The first part was of sociodemographic details including age, gender, educational status, occupation, marital status, any diagnosed psychiatric disorder, and internet usage hours. The second part included four standardized, valid and reliable questionnaires.

Internet Addiction Test (IAT). One of the most frequently used questionnaires to assess excessive or pathological use of the internet is Young's Internet addiction test (IAT), which consists of 20 items. This scale was designed on a 5-point Likert-type scale ranging from 1 (rarely) to 5 (always). The higher score on the questionnaire indicates greater addiction on the internet and the severity of the problems that individuals experience as a result of overuse. The total score of the IAT ranges from 20 to 100 and represents an individual's tendency to or the degree of IA. Refer to table 1 for scoring.

Table 1
Scoring of Young's Internet Addiction test

	Internet Addiction severity
Less than 30	Normal
31-49	Mild addiction
50-79	Moderate addiction
Higher than 80	Severe addiction

General Procrastination Scale (GPS). The scale has 23 items that measures academic, workplace, medical and civic responsibilities related procrastination. All items are required to be rated on a 5 point Likert scale ranging from 1 to 5. Scores of each item are calculated according to the following order: 1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always. Items 5, 8, 12, 16, 18, 21 and 23 were reversed scored. Scores are obtained as a sum of response to each item and they range from 23 to 115. A higher sum of scores obtained on all items indicates higher level of procrastination for the individual test taker.

Cognitive Failures Questionnaire (CFQ). The CFQ is a scale developed by Broadbent et al. in 1982 and aiming at measuring daily cognitive errors. It is a 25-item Self-report scale assessing the simple mistakes made within the last 6 weeks and measuring perception (e.g. Are there times when you cannot see something you need in a supermarket although it is there?), memory (e.g. Do you ever forget the names of people?) and motor functionality (e.g. Do you ever bump into anyone?). The answers are graded over the 5-point Likert-type scale (0= never, 1= very rarely, 2= sometimes, 3= often, 4= always). The lowest score that can be obtained from the scale is 0, and the highest score is 100. All the items in the scale are positively correlated with each other

Montreal Cognitive Assessment (MoCA). The Montreal Cognitive Assessment (MoCA) was developed by Dr Ziad Nasreddine in Montreal, Canada in 1995 for the detection of mild cognitive impairment (MCI) by health professionals. MCI is a syndrome defined as cognitive decline greater than expected for an individual's age and education level but that does not interfere not ably with activities of daily life. The assessment consists of a 30 point test

on a single side of A4 and can be administered in 10 min. The MoCA assesses several cognitive domains. These are Visuospatial/Executive, Naming, Memory, Attention, Language, Abstraction, Delayed Recall and Orientation (to time and place). Many of the elements are familiar or similar to other tests of cognitive function. Visuospatial abilities are assessed using a clock-drawing task and a trail-making task which is said to be useful in assessing fitness to drive. Attention, concentration and working memory are evaluated using a sustained attention task (target detection using tapping), a serial subtraction task and digits forward and backward. Refer to table 2 for scoring.

Table 2 MoCA score and interpretation

MoCA score	interpretation
≥ 26	Normal
Below 26	Mild cognitive impairment

ETHICAL CONSIDERATIONS

The approval of research topic and necessary permissions to conduct the study were obtained from ethical review board of Liaquat National School of Physiotherapy. Written informed consent from each participant was obtained after explaining all the details about the study.

Their voluntary engagement was assured and confidentially was maintained.

DATA ANALYSIS

Data were entered in Microsoft Excel and analyzed on SPSS version 22. Categorical data were reported in terms of numbers, frequencies and percentages. Continuous data were summarized using the mean and standard deviation. To study the association between categorical variables and differences in means with respect to categories, Chi-square test of association and Analysis of Variance (One Way ANOVA) were used, respectively. A p-value of ≤0.05 was considered statistically significant.

Result

In terms of demographic (Table 3) our study consisted of 406 (63.8%) females and 230 (36.2%) males of which 404 (63.5%) were students, 213 (33.5%) were employees and 19 (3%) were housewives. Furthermore, 473 (74.4%) were unmarried, 160 (25.2%) were married and only three divorced (0.3%). Refer to table 4 for student's discipline.

Table 3
Demographic characteristics

Baseline characteristics	N	%
Gender		
Male	230	63.8
Females	406	36.2
Age group		
Below 20 years	83	13.1
21-30 years	446	70.1
31-40 years	78	12.3
41-50 years	13	2.0
Above 50 years	16	2.5
Designation Student	404	63.5
Employee	213	33.5
Housewife	19	3.0
Marital status		
Unmarried	473	74.4
Married	160	25.2
Divorced	3	0.5

Table 4
Discipline of students

| Discipline	N	%
Physiotherapy	237	37.3
Medicine	45	7.1
Accounts	19	3.0
Engineering	28	4.4
Business Administration	24	3.8
Sociology	50	6.3
Media Science	12	1.9
Psychology	5	0.8

Note. This table only shows the discipline of students of n=404

Chi-Square enabled us to identify that 94.5% of the respondents had internet addiction of those 75.5% were moderately addicted, 15.3% were mildly addicted, and 3.8% had severe addicted. Only 5.5% of the participants were not addicted to the internet (Table 5). Based on results 30% of the moderately addicted participants used internet for 4-6 hours (Figure 2).51.4% of moderately addicted participants were aged in group 21-30 years (Figure 3).
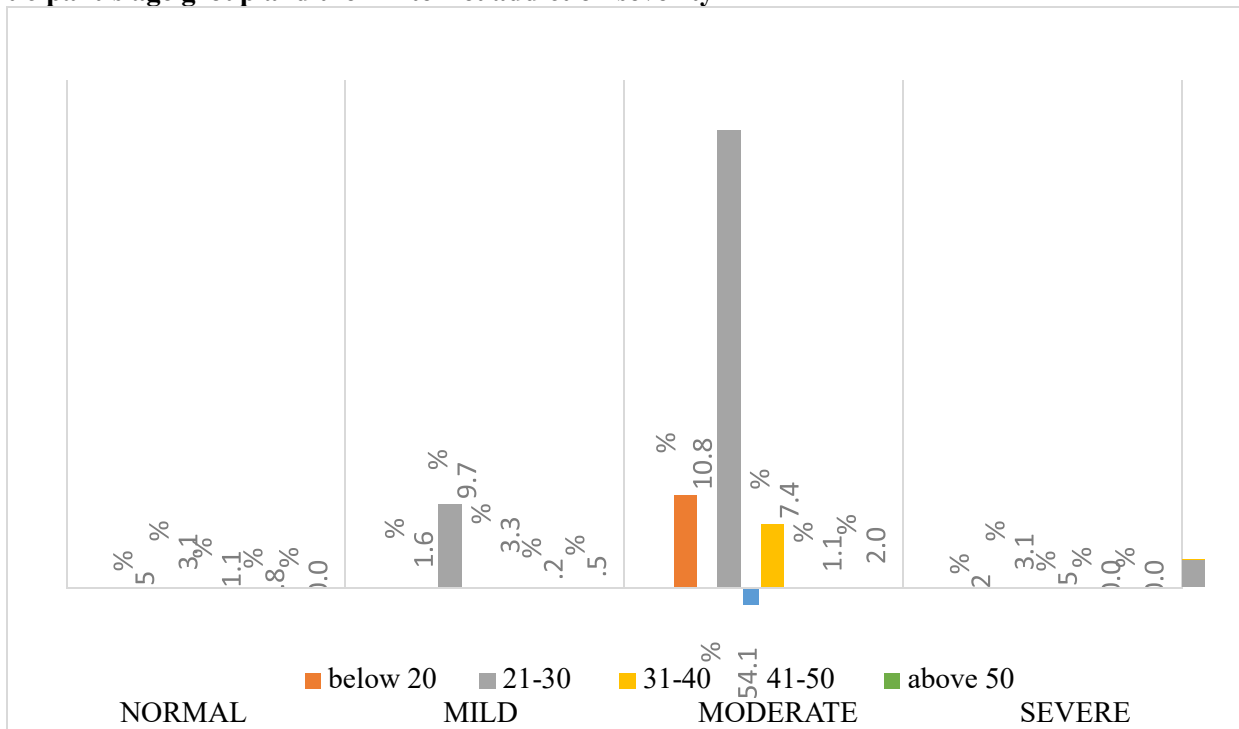
Table 5
Severity of internet addiction

Severity of internet addiction	N	%
Normal	35	5.5
Mild	97	15.3
Moderate	480	75.5
Severe	24	3.8

Figure 2: Participant's percentage of internet addiction and number of hours spent on internet.
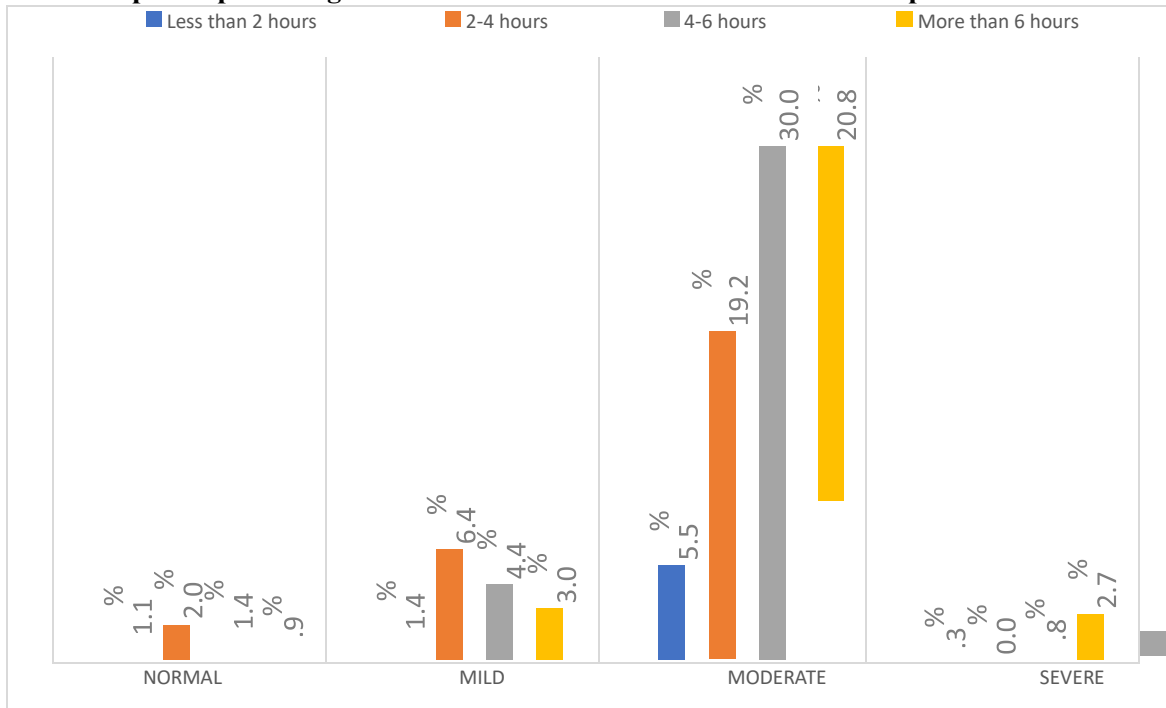
Figure 3
Participant's age group and their internet addiction severity

The mean score for procrastination was 76.87 ±10.17 SD. Participants aged between 31-40 years had highest procrastination score (M=79.28). Individuals under the age of 20 had lowest score (M=73.13) and employees scored higher (M=78.92) when compared with students

(M=75.74). Among discipline of students engineering students scored lower (M=72.64) than MBBS students (M=78.8). There was no statistically significant relationship between internet usage hours and procrastination scores.

Mean Cognitive Failure score was 45.26 ±17.7 SD. Compared to males (M=47.7) females participants scored lower (M=43.90). Respondents who utilized internet for more than six hours scored the highest (M=50.93) and those who utilized the internet for under two hours received the lowest scores (M=40.62).

Mean score for MoCA to identify cognitive impairment was 22.41 ±2.3 SD. 90.4% of the subjects had cognitive impairment. Only 9.6% respondents scored on the standard range demonstrating no cognitive impairments. Males scored higher on the attention component (M= 4.3 ±1.02 SD) than females (M= 2.9 ± 1.32 SD). 68.7% of subjects with cognitive impairment exhibited moderate internet addiction throughout the entire study. Only 0.9% of participants had no cognitive impairement nor internet addiction (Table 6).

Table 6
Severity of internet addiction and cognitive

Severity of internet addiction	Cognition (in %)		Total %
	Normal	Cognitive impairment	
Normal	0.9	4.6	5.5
Mild	1.7	13.5	15.3
Moderate	6.8	68.7	75.5
Severe	0.2	3.6	3.8
Total %	9.6	90.4	100.0

Note. Administration on MoCA determined cognitive impairment; scores ≥ 26 are considered normal.

The connection between internet addiction (an independent variable), procrastination, and cognitive failure (dependent variable) was analyzed using One-way ANOVA. The result of OneWay ANOVA revealed a significant relation between internet addiction, procrastination (p .002) and cognitive failure (p .000) (Table 7). Individuals with a severe internet addiction performed much worse on tests measuring procrastination and cognitive. Procrastination and cognitive failure became more prevalent as the intensity of internet addiction intensified

Table 7
Summarized result of One-way ANOVA and p value.

	Severity of internet addiction	N	Mean	Std. Deviation	P
General Procrastination Scale	Normal	35	72.26	11.459	
	Mild	97	76.87	9.698	
	Moderate	480	76.93	10.173	0.002
	severe	24	82.38	7.300	
	Total	636	76.87	10.177	
Cognitive Failure Questionnaire	Normal	35	30.03	14.722	
	Mild	97	36.72	16.057	
	Moderate	480	46.92	16.443	0.000
	severe	24	68.96	18.076	
	Total	636	45.26	17.708	

Discussion

The objective of this research was to ascertain how internet addiction relates to cognition and procrastination. There have been few research examining the connection between pathological internet use and mild cognitive impairment (22), but this study has found a significant link between internet addiction, cognitive impairment and procrastination. There is high prevalence of internet addiction and mild cognitive impairments among the participants of all age groups. There was no discernible correlation between internet addiction and age, although there was a reduction in cognition as individuals age group increased. Males were more likely than females to experience cognitive difficulties. Mostly mild cognitive impairment was seen in moderate internet users. It's possible that people initially attempt to control their addiction, but as their dependence grows, they find it more challenging to do so, leading to cognitive failures (23). Another crucial finding was that internet addiction tended to be positively connected with usage hours, meaning the more hours spent on internet, the worse the addiction. In comparison to employees, students, particularly female students, were more addicted to the internet. This may be because the school system has allowed internet use, permitting students to partake in research work and projects (23).

Additionally, no connection between gender and procrastination was shown to be significant. The outcome that stood out is that employees procrastinate more than students do and have more cognitive problems which was contrary to Ahmed, Zeb & Muhammad's (2019) study. Although there was a strong positive correlation between internet addiction and procrastination which was in line with research from the literature (7, 15). When one's life is dominated by the internet, it can be explained by the phenomenon of preoccupation, which leads one to neglect their obligations and, in turn, to general procrastination (14). Procrastination is also influenced by cognitive impairment.

Implications

Given the lack of research on internet addiction and how it relates to cognitive functions, this study could serve as a foundation for future research. Through this research Institutions and organizations could provide seminars or other techniques to lessen internet addiction and procrastination and improve cognitive performance.

Limitations and suggestions

There are some constraints that demand special attention in any future work. This study recruited participants of Karachi through convince based sampling. It is possible to do systematic random sampling and collect samples from several different and expansive geographic areas. A longitudinal study design might provide a more comprehensive explanation for the phenomena being studied. The lives of subjects could be followed to comprehend the phenomenon of internet addiction on the ageing population. This study's inability to examine any psychiatric problem or diagnosis using any tool is another shortcoming. This was an exploratory study that helped to uncover this new body of knowledge, but more research with different populations and cultural backgrounds is required.

Conclusion

The present research explained that internet addiction does lead to cognitive impairments, cognitive failure and procrastination. It is obligatory for us to determine our compulsive internet use so that we can minimize its adversative effects and improve quality of our life.

REFERENCES

Lin I-H, Ko C-H, Chang Y-P, Liu T-L, Wang P-W, Lin H-C, et al. The association between suicidality and Internet addiction and activities in Taiwanese adolescents. Comprehensive psychiatry. 2014;55(3):504-10.

Zheng S, Duan Y, Ward MR. The effect of broadband internet on divorce in China. Technological Forecasting and Social Change. 2019;139:99-114.

Chen Y-F, Peng SS. University students' Internet use and its relationships with academic performance, interpersonal relationships, psychosocial adjustment, and self-evaluation. CyberPsychology & Behavior. 2008;11(4):467-9.

Aguenza BB, Al-Kassem AH, Som APM. Social media and productivity in the workplace: Challenges and constraints. Interdisciplinary Journal of Research in Business ISSN. 2012;2046:7141.

D'Hondt F, Billieux J, Maurage P. Electrophysiological correlates of problematic Internet use: Critical review and perspectives for future research. Neuroscience & Biobehavioral Reviews. 2015;59:64-82.

Young KS. Internet addiction: Evaluation and treatment. British Medical Journal Publishing Group; 1999.

SALEEM M, OWAISI AM, TUFAIL MW. Internet addiction: It's impact on procrastination of higher learning students in Pakistan. The Sindh University Journal of Education-SUJE. 2015;44(2).

Cao F, Su L, Liu T, Gao X. The relationship between impulsivity and Internet addiction in a sample of Chinese adolescents. European Psychiatry. 2007;22(7):466-71.

Yen J-Y, Ko C-H, Yen C-F, Wu H-Y, Yang M-J. The comorbid psychiatric symptoms of Internet addiction: attention deficit and hyperactivity disorder (ADHD), depression, social phobia, and hostility. Journal of adolescent health. 2007;41(1):93-8.

Niermann HC, Scheres A. The relation between procrastination and symptoms of attention-deficit hyperactivity disorder (ADHD) in undergraduate students. International journal of methods in psychiatric research. 2014;23(4):411-21.

Şenormancı Ö, Saraçlı Ö, Atasoy N, Şenormancı G, Koktürk F, Atik L. Relationship of Internet addiction with cognitive style, personality, and depression in university students. Comprehensive psychiatry. 2014;55(6):1385-90.

Bozoglan B, Demirer V, Sahin I. Loneliness, self-esteem, and life satisfaction as predictors of Internet addiction: A cross-sectional study among Turkish university students. Scandinavian journal of psychology. 2013;54(4):313-9.

Javaeed A, Bint Zafar M, Iqbal M, Ghauri SK. Correlation between Internet addiction, depression, anxiety and stress among undergraduate medical students in Azad Kashmir. Pakistan journal of medical sciences. 2019;35(2):506.

Hayat AA, Kojuri J, Mitra Amini M. Academic procrastination of medical students: The role of Internet addiction. Journal of advances in medical education & professionalism. 2020;8(2):83.

Rafiq N. Exploring the relationship of personality, loneliness, and online social support with interned addiction and procrastination. Pakistan Journal of Psychological Research. 2016;31(1).

Klingsieck KB. Procrastination. European psychologist. 2013.

Bushra K, Suneel I. Big five personality traits, gender, academic level and academic procrastination among Pakistani undergraduate students. PJPPRP. 2021;12(1).

Odaci H. Academic self-efficacy and academic procrastination as predictors of problematic internet use in university students. Computers & Education. 2011;57(1):1109-13.

Rebetez MML, Rochat L, Van der Linden M. Cognitive, emotional, and motivational factors related to procrastination: A cluster analytic approach. Personality and Individual Differences. 2015;76:1-6.

Beleaua R-E, Cocoradă E. Procrastination, stress and coping in students and employees. Romanian Journal of Experimental Applied Psychology. 2016;7(1):191-5.

Ahmad S, Zeb H, Muhammad H. Emotional intelligence, personality traits and procrastination among students and employees of Khyber Pakhtunkhwa. Pakistan Journal of Psychology. 2019;50(2).

Cudo A, Zabielska-Mendyk E. Cognitive functions in Internet addiction–a review. Psychiatr Pol. 2019;53(1):61-79.

Ali AZ, Nisa U. Cognitive failures and internet addiction among university students: an exploratory study. Pakistan Journal of Psychology. 2013;44(1).