



**ASSOCIATIONS BETWEEN INTERNET GAMING DISORDER,
FEAR OF MISSING OUT AND SLEEP QUALITY WITH RESPECT TO AGE AND
GENDER**

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Abstract

The aim of the study was to examine the associations between Internet Gaming Disorder, Fear of Missing Out, and Sleep Quality among adolescents and emerging adults. A cross-sectional study was conducted among 67 individuals from Delhi NCR region (females=37 (62%) and males=30(45%). The data were collected via the convenience sampling method through social media platforms. The data obtained were analysed with the SPSS version 22 software package. The descriptive statistics for the sample under study shows a significance of internet gaming disorder, with an overall average score of 30.8657 (SD=12.22875), moderate risk of Fear of Missing Out, with an overall average score of 33.1791 (SD=10.979) and moderate levels of sleep difficulties with an average score of 11.5821 (SD=4.37676). Results show that male adolescents (15-19 years) tend to have higher levels of Internet Gaming Disorder and Fear of Missing Out as compared to emerging adults (20-24 years) and their female counterparts. Sleep Quality found to be slightly worse among male adolescents (15-19 years). Internet Gaming Disorder is found to be significantly correlated with Fear of Missing Out ($\rho = 0.626$) at 0.01 % level of significance and moderately correlated with Sleep Quality ($\rho = 0.288$) at 0.05% level of significance. Also, Fear of Missing Out is found to be significantly correlated with Sleep Quality ($\rho = 0.384$) at 0.01% level of significance. The p values for Internet gaming Disorder($p=0.208$) and Fear of Missing Out($p=0.105$) found to be more than 0.05 and hence they are not the predictors of Sleep Quality. The findings from the present study suggest that due care should be taken to address online gaming behaviours and social media usage. The more a person fears being left out, the more they may indulge in online gaming and other digital activities to compensate, which will disrupt their sleep rhythms and lead to poorer sleep habits. Moreover, lifestyle, familial, and social variables, mental health, and digital usage can all contribute to poorer sleep habits and sleep disruptions.

Keywords: smartphone addiction, adolescents, sleep disturbances, sleep onset, sleep latency, etc.

INTRODUCTION

The invention of mobile gadgets, particularly smartphones, has revolutionized communication technology and fostered human interactions. Smartphones offer a variety of advantages, including quick access to communication and the ability to stay in touch with friends and family at any time and any place (Ansari et al., 2016). Smartphones have gained popularity in recent years by providing new avenues to cultivate relationships and remain socially linked (Walsh et al., 2008). The tremendous impact of this device on people's lives has triggered a variety of challenges that have a bearing on their physical, socio-emotional, and cognitive selves (Szymkowiak et al., 2021). It is well-acknowledged fact that individuals tend to become independent from their parents after a certain age, developing a sense of self, and reducing stress through interactions with friends (Colarusso, 2013). Adolescents strive to interact with their companions since social connection and emotional support are essential at this developmental stage (Magson et al., 2021). Several studies have recognized that adolescents often connect with others using social networking sites rather than face-to-face because they lack social skills and have low self-esteem (Corey & Bonnie, 2014). To rephrase it in another way, a lack of social skills might drive an adolescent to become reliant on internet services (Caplan, 2003). One of its most profound impacts seems to be the deterioration of the same communication that the smartphone was first lauded for. Constant usage of smartphones to keep themselves updated with their social environment plays an important role in developing their social media habits (Chassiakos et al., 2016). To eradicate these technological addiction issues, individuals are suggested to stay away from their smartphones, which in turn makes them unaware of the happenings and updates in their social surroundings, causing anxiety issues (Dossey, 2014). This leads to the arise of Fear of Missing Out (FoMO). More FOMO developed in individuals increases their social media usage intensity (Gradisar et al., 2013) and social media fatigue levels (Eaton et al., 2009). In the context of social media platforms, the Fear of Missing Out (FoMO) refers to the panic that arises in the individual when the posted online content and online interactions from other users go unnoticed and unreacted by them on a timely basis (Dossey, 2014). FOMO can be troublesome, causing worry, disrupted sleep, loss of attention, and a reliance on social media for fulfilment. Considering the widespread use of smartphones in everyday life, smartphone addiction has emerged as a significant problem in contemporary society. Smartphone addiction is a form of behavioural addiction that is triggered by nonchemical impulses and involves interaction between humans and machines (Griffiths, 1996). One of the most striking features of smartphones is the ability to use multiple Web-based apps such as online games, social networks, and messengers (Chassiakos et al., 2016). Minimal participation in digital gaming is deemed acceptable and may provide certain benefits, such as emotional release and relief (Prot et al. 2014). However, compulsive, or addicted gaming behavior emerges when individuals are incapable to control their urge to play digital games and when gaming impairs emotions, judgment, or social life (Griffiths and Davies 2005). Healthy gaming may provide significant educational, training, and skill-development advantages (Cade & Gates, 2017). However, some individuals are unable to regulate their gamers' conduct because of the overwhelming gravitational lure of games (Thomas et al., 2011). Online gaming has become a very ubiquitous practice that, in certain circumstances, has detrimental consequences and is potentially compulsive (Ko et al., 2020).

Additionally, a trend analysis of insomnia among adolescents in Europe discovered a substantial correlation between screen usage and problems of falling asleep that grew worse between the years 2002 and 2014 (Ghekiere et al., 2018). Time spent on smartphones and online gaming platforms can have adverse effects on sleep and sleep-aiding behavior (Exelmans & Bulck, 2017). To be able to carry out activities adequately, every individual needs sufficient sleep time, which is defined not just by the sleep time (sleep quantity), but also by the quality of sleep (Killgore, 2010). Poor sleep, or sleep restriction, is defined by the International Classification of Sleep Disorders (ICSD-3) as a limited sleep pattern that has lasted for approximately around three months on most days of the week, together with signs of daytime, sleep disruptions (Chattu et al., 2018).

To the investigator's knowledge, there are limited Indian studies about existence of associations between Internet Gaming Disorder and FOMO (Fear of Missing Out) behaviour exhibited by adolescents and emerging adults due to excessive usage of smartphones and its impact on their Sleep Quality. Although several investigations attempt to shed light on the relationship between internet and behavioural addictions, it has been noted that there are relatively few investigations that focus on excessive gaming tendencies and their results in problematic sleep behaviour. And hence this study aims to address the following research questions:

1. What are the levels of internet gaming disorder, Fear of Missing Out and quality of sleep among respondents?
2. How do socio-demographic variables (age and gender) influence the levels of Internet Gaming Disorder, Fear of Missing Out, and Sleep Quality among respondents?
3. Does there exist any significant correlation between Internet Gaming Disorder, Fear of Missing Out and Sleep Quality?
4. Does Internet Gaming Disorder and Fear of Missing Out in respondents collectively predict levels of Sleep Quality in them?

Also, this study intends to spread awareness about gaming addiction and enhance public awareness about how to moderate their use of smartphones so that feelings of anxiety that develop when they cannot use their phones or in the absence of their phones can be managed and other problems, such as lack of sleep, may be avoided. The conceptual framework and paradigm for idea development are described in the next section. The third part discusses with the technique and strategy followed by the investigator. Section four discusses data gathering and analysis, as well as the outcomes. The fifth and final part includes a discussion of the results, as well as conceptual, operational, and empirical interpretations and conclusions.

THEORETICAL BACKGROUND AND LITERATURE REVIEW

The proliferation of mobile social media is another factor contributing to the widespread appeal of smartphones (Wyche & Baumer, 2017). Users may now talk to one other and the rest of the world in text, voice, and video via the usage of these applications. The level of accessibility of the social media applications is completely individuals' choice (Brandtzæg et al., 2010). The accessibility of smartphones and, by inference, the constantly increasing connectivity over internet and social media platforms, has undoubtedly witnessed innumerable benefits over the past decade, although it has not been without its challenges (Chassiakos et al., 2016). Because of its compulsive usage, some users have developed a

pathological dependency on social media (Franchina et al., 2018). Due to the ubiquity and applicability of social media applications on mobile devices, this phenomenon has been branded "Social Media Addiction (Watkins, 2009). Torous et. al, (2021) have also claimed that the only real difference between this and Internet Addiction is the medium of delivery. Many prior research has established that extensive usage of both gaming and social media is linked with adverse effects on the emotion regulation and well-being of individuals (Fabris et al., 2020). Studies have implicated problematic gaming, for instance, to melancholy, anxiety, poorer subjective wellbeing, and to detrimental consequences on social relationships (Desai et al, 2010). Similarly, inappropriate social media usage has been linked to psychological disorders (O'Reilly et al., 2018).

Both the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and the International Classification of Diseases, Eleventh Revision (ICD-11) define problematic gaming as "ongoing or recurrent gaming" characterised by compromised game control, greater concentration on the game, and extended or repeated gaming despite detrimental consequences (Reed et al., 2022). Prior research has shown that Online gaming problem is associated with anxiety and sadness (Andreassen et al., 2016). It is plausible that persons with depression or anxiety are more inclined to take part in online socialization in order to satisfy their psychological requirements (Chang & Lin, 2019). Hence, persons with severe depression and generalized anxiety are more prone to engage in excessive smartphone or Internet gaming (Su et al., 2020). FoMO has a significant influence in the development of psychopathological symptoms such as anxiety and depression in the context of Social Network Sites (SNSs) (Eaton et al., 2009), and its presence has been reported to be positively correlated with the problematic usage of SNSs (Przybylski et al. 2017). In furthermore, a related study reveals that problematic SNS usage and online gaming addiction have comparable characteristics and outcomes (Andreassen et al., 2016). Both social media addiction and Internet Gaming Disorder have been linked to sleep problems, including a decline in Sleep Quality and a shorter length of sleep (Achab et al., 2011). Smartphones and other portable technological tools that may be carried to bed are a possible cause for both SMA and IGD-related sleep disruptions (Fossum et al., 2014). With portable cell phones and Wi-Fi connection, the internet (including social media) may be an unstructured, non-time-bound activity that may absorb time and as a result, can contribute to sleeplessness (Exelmans & Bulck, 2017; Gezgin, 2018). Moreover, delayed bedtimes and late wake hours may contribute to rhythm dissonance and negatively affect academic performance (Chattu et.al., 2018). Emotional arousal (e.g., an enthusiastic mood owing to social media use), light-emitting screens, which may block sleep-promoting hormones like melatonin that are generally increased before sleep, and shorter sleep durations are all possible processes by which social media use disrupts sleep (Chang et al., 2015). Identical considerations apply to internet gaming also. Often, users from various time zones join in online games (Achab et al., 2011). As a result, some players may choose not to sign out of their accounts or may get up in the middle of the night to continue playing, which can result in sleep-wake cycles that are erratic or disorderly (Rehbein et al., 2015). People may experience sleep deprivation to participate in virtual activities. Consistently, online gaming has been linked to higher sleep latencies and shorter total REM sleep (Gradisar et al., 2013).

The investigator is interested in taking this study of Internet Gaming Disorder and FOMO, as it is evident that due to such technological addictions, the fear of being missed out in the virtual world of social media ascends. Investigator in the current study examines the associations between Internet Gaming Disorder, Fear of Missing Out and the Sleep Quality. Based on the research questions that the investigator wants to answer through this study following objectives have been formulated:

1. To study the levels of Internet Gaming Disorder, Fear of Missing Out and patterns of Sleep Quality among respondents.
2. To study the influence of age and gender on Internet Gaming Disorder, Fear of Missing Out and patterns of Sleep Quality among respondents.
3. To find out the relationship between Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.
4. To find out the combined effect of Internet Gaming Disorder and the Fear of Missing Out on the Sleep Quality among respondents.

The following hypotheses were formulated by the investigator to fulfil the above-mentioned objectives:

H01: There exists no significant difference between the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

H02: There exists no influence of age on the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

H03: There exists no influence of gender on the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

H04: There exists no relationship between of Internet Gaming Disorder and Fear of Missing Out among respondents.

H05: There exists no relationship between of Internet Gaming Disorder and Sleep Quality among respondents.

H06: There exists no relationship between of Fear of Missing Out and Sleep Quality among respondents.

H07: The regression coefficient to predict Sleep Quality of respondents based on Internet Gaming Disorder and Fear of Missing Out is zero.

METHODOLOGY

Study Design and Respondents

A cross-sectional study was conducted to collect the data from the individuals via the convenience sampling method and could be reached by communicating through social media platforms. The study group consisted of 67 individuals from Delhi NCR region (females=37 (62%) and males=30(45%). Individuals belonging to 15 to 24 years of age and are currently enrolled in any formal educational institution and currently possessing a smartphone with Internet access were included in the study. Individuals who were currently on any medication affecting sleep were excluded.

Questionnaires

The Internet Gaming Disorder Scale--9-Item Short Form (IGDS-SF9)

The Internet Gaming Disorder 9-item scale is basically a 5-point Likert scale ranging from 1 (Never) to 5 (Very Often) to determine the degree of Internet Gaming Disorder and its

negative impacts by evaluating both online and/or offline gaming habits over a 12-month period. This brief psychometric assessment is an adaption of the nine basic criteria that identify IGD according to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA, 2013). A overall score may be calculated by adding responses ranging from 9 to 45 points, with higher values indicating more severe IGD. A cut-off score of more than 21 suggests that online gaming is harmful. The tool has shown to be valid and reliable for evaluating IGD (Pontes & Griffiths, 2015).

Fear of Missing Out Scale

The Fear of Missing Out Scale (FoMOs) developed Przybylski and colleagues in 2013 and is a 10-item unidimensional scale set on 5-point Likert type responses where each item was rated from “1 = Not at all true of me” to “5 = Extremely true of me,” with higher total scores indicating higher levels of FOMO. It assesses how much one fears missing out on social events, particularly those involving friends, and how frequently they use social media to stay (hyper)connected. The scale was found to have high internal consistency ($\alpha = .82$) (Przybylski et al., 2013).

The Pittsburgh Sleep Quality Index (PSQI)

The PSQI uses a total of nineteen questions to perform its analysis of Sleep Quality. These questions can be arranged into seven distinct domains, which are as follows: subjective Sleep Quality (Q6), sleep latency (Q2 and Q5a), sleep duration (Q4), habitual sleep efficiency (Q1, Q3, and Q4), sleep disturbances (Q5b-Q5j), use of sleeping medication (Q7), and daytime dysfunction (Q8 and Q9) The questions focus on analysing the quality of sleep as well as any disruptions that occur over the course of one month. The range of possible points for each enquiry is from 0 (no difficulty) to 3 (severe difficulty). When all the scores of components are added together, they provide an overall score that may range anywhere from 0 to 21, with higher numbers indicating a worse quality of sleep. It has been suggested that a score of 5 for sleep impairment might be used as a cut-off point to differentiate between excellent sleep and bad sleep. A high degree of internal consistency has been proven by the PQSI ($\alpha = 0.83$). Cronbach's alpha for the questionnaire in the Indian context was found to be 0.736 (Manzar et al., 2015) . The test-retest reliability is quite good for both the overall scores and the component scores. It has been claimed that the PSQI is a helpful screening test for students who are experiencing insomnia (Buysse et al., 1989).

COLLECTION & ANALYSIS OF DATA

Respondents were asked for their consent before the questionnaires (in form of Google Forms) were shared with them through WhatsApp. The Google Forms included background information sheet and following questionnaires: Internet Gaming Disorder Scale–Short-Form (IGDS9-SF), Fear of Missing Out Scale: FoMOs, and Pittsburgh Sleep Quality Index (PSQI). The data obtained were analysed with the SPSS version 22 software package.

The descriptive statistical analysis for the total scores of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality was done to analyse the collected data. The calculated Kolmogorov–Smirnov and Shapiro Wilk test p- values for the total scores of all the three variables under study were found to be less than $\alpha = 0.05$ which examined the normality

distribution assumption (Mishra et al.,2019). Thus, the data were not normally distributed (Table I).

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
fomo	.165	67	.000	.932	67	.001
igd	.230	67	.000	.856	67	.000
sleepquality	.143	67	.002	.960	67	.031

a. Lilliefors Significance Correction

Table I: Test of Normality for variables under study

Frequency distribution on the basis of age and gender is depicted in form of table II. The descriptive statistics for Internet Gaming Disorder, Fear of Missing Out and Sleep Quality are given in table III. Also, Independent sample Mann Whitney U test and independent sample Kruskal Wallis Test was employed to test whether there is a statistically significant difference between the variables based on age and gender. After examining that variables do not follow normality, the non-parametric statistical test for Correlation Analysis was employed to derive the relationship between Internet Gaming Disorder, Fear of Missing Out and Sleep Quality. Also, regression analysis was done using the Curve estimation technique in SPSS version 22 to figure out whether the Internet Gaming Disorder and Fear of Missing Out predicts the Sleep Quality among respondents.

RESULTS

Analysis of Socio-demographic Characteristics

Table II shows the frequency distribution of sample based on socio demographic variables. It is evident from the table that 65.7 % of participants belong to age group 15-19 years (adolescents) and 34.3% belongs to 20-24 years (emerging adults). Female respondents constitute the 55% and male counterparts 45% in the sample.

Socio Demographic Variables	Age		Gender	
	15-19 YRS	20-24 YRS	FEMALE	MALE
Frequency	44	23	37	30
Percent	65.7	34.3	55.2	44.8

Table II: Frequency Distribution based on socio demographic variables.

Objective 1: To study the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

Table III depicts the descriptive statistics for the levels of Internet Gaming Disorder, Fear of Missing Out and patterns of Sleep Quality. The descriptive statistics for Internet Gaming Disorders how that the sample under study has a significant levels of internet gaming disorder, with an overall average score of 30.8657 (SD=12.22875). The sample under study suffers from a moderate risk of Fear of Missing Out, with an overall average score of 33.1791 (SD=10.979). Lastly, results show that individuals suffer from moderate levels of sleep difficulties with an average score of 11.5821 (SD=4.37676). The results are significant and

hence the stated hypothesis “There exists no significant difference between the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents” is rejected.

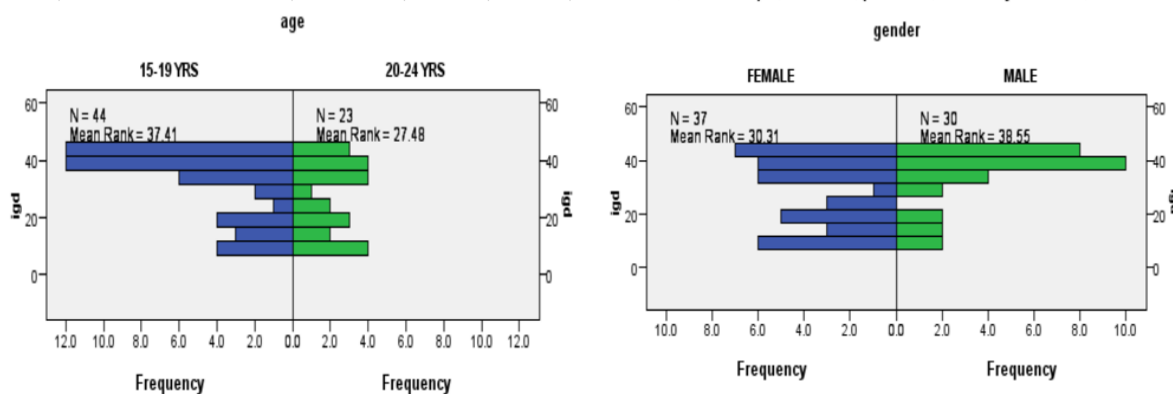
Table III: Descriptive Statistics for Internet Gaming Disorder, Fear of Missing Out and Sleep Quality

Descriptive Statistics												
	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
fomo	67	37.00	12.00	49.00	2223.00	33.1791	10.97922	120.543	-.371	.293	-1.137	.578
igd	67	36.00	9.00	45.00	2068.00	30.8657	12.22875	149.542	-.620	.293	-1.175	.578
sleepquality	67	17.00	3.00	20.00	776.00	11.5821	4.37676	19.156	.028	.293	-1.066	.578
Valid N (listwise)	67											

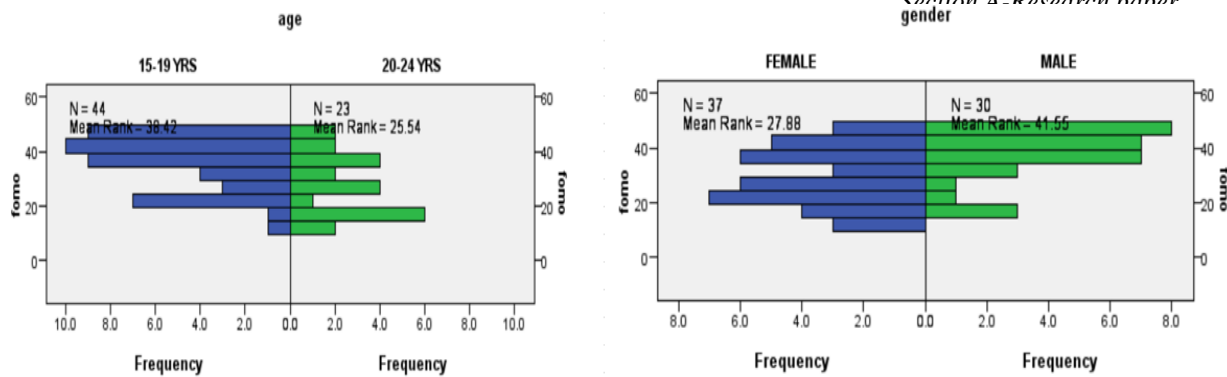
Objective 2: To study the influence of age and gender on Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

It is evident from the bar chart i that Internet Gaming Disorder is found to be on higher level among adolescents (age group 15-19 years) with a mean value of 37.41 (n=44) as compared to emerging adults (age group = 20-24 years) with a mean value of 27.48 (n=23). Also, it is found significantly high among males with mean value of 38.55 (n=30) as compared to females with a mean value of 30.31 (n=37).

Bar chart i : Levels of Internet Gaming Disorder on the basis of age and gender

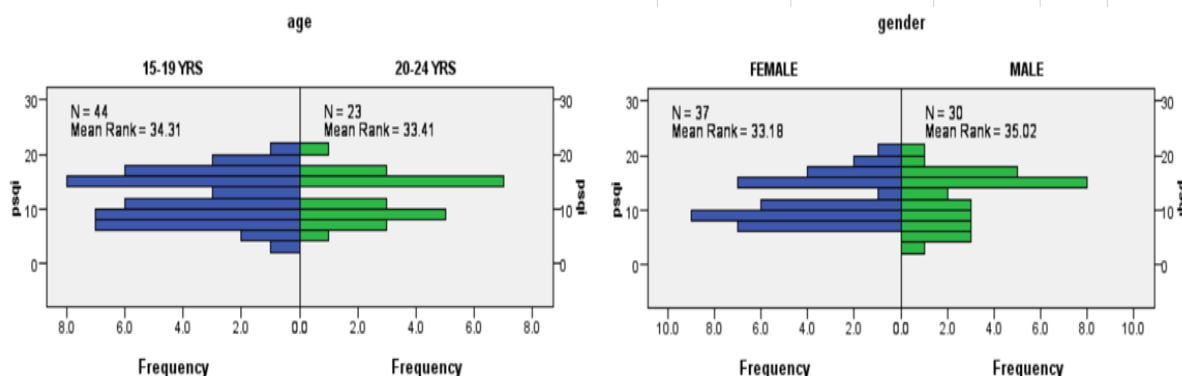


The bar chart ii shows that Fear of Missing Out found to be higher among adolescents (age group 15-19 years) with a mean value of 38.42 (n=44) as compared to emerging adults (age group = 20-24 years) with a mean value of 25.54 (n=23). Also, it is found significantly high among males with mean value of 41.55 (n=30) as compared to females with a mean value of 27.88 (n=37).



Bar chart ii: Levels of Fear of Missing Out on the basis of age and gender

The bar chart iii shows that Sleep Quality found to be slightly worse among adolescents (age group 15-19 years) with a mean value of 34.31(n=44) as compared to emerging adults (age group = 20-24 years) with a mean value of 33.41 (n=23). Also, it is found significantly worse among males with mean value of 35.02 (n=30) as compared to females with a mean value of 33.18 (n=37).



Bar chart iii: Sleep Quality on the basis of age and gender

Table IV consists of a comparison test (Independent sample Mann Whitney U test for two groups) that was conducted to determine whether the socio demographic variables: age and gender, influenced the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents. It is evident from the table that Age does influence the levels of Internet Gaming Disorder and Fear of Missing Out whereas does not influence the Sleep Quality among respondents. Hence, the levels of Internet Gaming Disorder and Fear of Missing Out found to be significantly different among adolescents and emerging adults. Whereas the Sleep Quality remains to be same across adolescents and emerging adults. Gender also influences the Fear of Missing Out levels among respondents whereas has no influence on the Internet Gaming Disorder and Sleep Quality. So, the below stated hypotheses found to be rejected.

H02: There exists no influence of age on the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

H03: There exists no influence of gender on the levels of Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents.

SOCIO DEMOGRAPHIC VARIABLES		INTERNET GAMING DISORDER	FOMO	SLEEP QULITY
AGE	SIG. VALUE	0.047	0.01	0.858
	DECISION	REJECT NULL HYPOTHESIS	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS
GENDER	SIG. VALUE	0.085	0.004	0.7
	DECISION	ACCEPT NULL HYPOTHESIS	REJECT NULL HYPOTHESIS	ACCEPT NULL HYPOTHESIS

Table VI: Test of comparison for Internet Gaming Disorder, Fear of Missing Out and Sleep Quality based on socio demographic variables age and gender .

Objective 2: To find out the relationships between Internet Gaming Disorder, Fear of Missing Out and Sleep Quality.

Table V depicts the correlational analysis between the three variables i.e., Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents. It is evident that Internet Gaming Disorder is found to be significantly correlated with Fear of Missing Out ($\rho = 0.626$) at 0.01 % level of significance and moderately correlated with Sleep Quality ($\rho = 0.288$) at 0.05% level of significance. Also, Fear of Missing Out is found to be significantly correlated with Sleep Quality ($\rho = 0.384$) at 0.01% level of significance. The results are statistically significant.

Hence, the below stated hypotheses are rejected i.e.,

- ❖ There exists no relationship between of Internet Gaming Disorder and Fear of Missing Out among respondents.
- ❖ There exists no relationship between of Internet Gaming Disorder and Sleep Quality among respondents.
- ❖ There exists no relationship between of Fear of Missing Out and Sleep Quality among respondents.

Table V: Correlational analysis between variables

Correlations			igd	fomo	psqi
Spearman's rho	igd	Correlation Coefficient	1.000	.626**	.288*
		Sig. (2-tailed)	.	.000	.018
		N	67	67	67
	fomo	Correlation Coefficient	.626**	1.000	.384**
		Sig. (2-tailed)	.000	.	.001
		N	67	67	67
	psqi	Correlation Coefficient	.288*	.384**	1.000
		Sig. (2-tailed)	.018	.001	.
		N	67	67	67

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Objective 3: To find out the combined effect of Internet Gaming Disorder and the Fear of Missing Out on the Sleep Quality.

Table VI depicts the Multiple Regression Analysis between the three variables i.e., Internet Gaming Disorder, Fear of Missing Out and Sleep Quality among respondents. The value of $R = 0.398$ (Correlation Coefficient), indicates a moderate level of correlation. The value of $R^2 = 0.158$ (coefficient of determination) indicates the 15.8 % of variance in Sleep Quality

being explained by the Internet Gaming Disorder and Fear of Missing Out. The F-ratio tests whether the overall regression model is a good fit for the data. The table shows that the independent variables i.e., Internet Gaming Disorder and Fear of Missing Out combined have a statistically significant association with the dependent variable i.e., Sleep Quality, $F(2, 64) = 6.020$, $p < 0.004$ (i.e., less than $\alpha = .05$). This shows the regression model is a good fit of the data. The p values for Internet gaming Disorder ($p=0.208$) and Fear of Missing Out ($p=0.105$) found to be more than 0.05 and hence independent variables i.e., Internet Gaming Disorder and Fear of Missing Out are not the predictors of Sleep Quality. The results are not statistically significant.

Hence, the stated hypothesis H04 i.e., The regression coefficient to predict Sleep Quality of respondents based on Internet Gaming Disorder and Fear of Missing Out is zero is accepted.

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	6.205	1.641		3.782	.000	2.927	9.483
	fomo	.098	.060	.247	1.647	.105	-.021	.218
	igd	.068	.054	.191	1.273	.208	-.039	.176
R = 0.398 , R square =0.158, F(2, 64)= 6.020 , P =0.004 (Mean square_Regression =100.090 , df =2 & Mean square_Residual =16.627 , df =64)								
a. Dependent Variable: psqi								
b. Predictors: (Constant), igd, fomo								

Table VI: Multiple Regression Analysis between variables under study.

DISCUSSIONS AND CONCLUSION

Usually, Internet gaming incorporates participation in multi-player chat rooms. Internet gamers usually establish their teams in a virtual competitive atmosphere especially with people they have never met in person with a common goal of winning. These individuals tend to face fear of being missing out among their teammates as they end up spending hours on playing and winning the game which eventually leads to poorer sleep routines in them.

The findings of the study demonstrated the prevalence of sleep disturbances among adolescents and emerging adults and the influence of Internet Gaming Disorder and Fear of Missing Out, on their Sleep Quality. It is evident from the results that male respondents belonging to age group of 15 to 19 years (adolescents) have greater Internet Gaming Disorder and Fear of Missing Out and faced difficulties in their sleep routine as compared to their female counterparts. Similar findings have been found in a study conducted in Indonesia which showed a decrease in Sleep Quality due to gaming addiction (Kharisma et al., 2020). The descriptive analysis also reveals that age does have a significant influence on the Internet Gaming Disorder and Fear of Missing Out but not on Sleep Quality, which is similar to the results of the study conducted by Gezgin (2018). Whereas gender only influences Fear of Missing Out levels among respondents whereas has no influence on the Internet Gaming Disorder and Sleep Quality. The correlational analysis revealed a strong correlation between Internet gaming disorder, Fear of Missing Out and Sleep Quality. Like the findings from the study conducted by Zaman et al. (2022), this study showed a significant relationship between

Internet Gaming Disorder and Fear of Missing Out ($\rho = 0.626$) at 0.01 % level of significance and moderately correlated with Sleep Quality ($\rho = 0.288$) at 0.05% level of significance. Also, Fear of Missing Out is found to be significantly correlated with Sleep Quality ($\rho = 0.384$) at 0.01% level of significance. A study conducted in Hong Kong showed a significant relationship between gaming addiction and poor Sleep Quality (Kwok et al., 2021). The prolonged time spent on screen induces fatigue, which hinders eye closure and impairs sleep (Zaman et al., 2022). Although the findings indicate to an association between Internet gaming disorder, FOMO, and sleep quality, the regression analysis reveals that neither of these variables is a very strong predictor of sleep quality or sleep disruptions among respondents. When first starting out with a smartphone, most people have a great time chatting with their friends and family and experience joy and entertainment. Yet, other people experience anger, anxiety, and pain when they use their smartphones too much, which can lead to addiction and poor sleep quality (Li et al., 2020). Studies also show that addiction to internet and associated gaming is also related to the sense of loss of control which eventually leads to functional impairment, stress and social dysfunction (Alhassan et al., 2018). Because Internet gaming disorder and using social media may interact with one another and can lead to fear of missing out among them, the results of the current study suggest that proper care should be taken to address online gaming behaviours and use of social media. This is because Internet gaming disorder and using social media may both lead to fear of missing out. The more an individual exhibits the fear of being missed out among fellows, the more he or she will try to cope up with it by indulging into online gaming behaviour and other digital presence activities, thereby hampering their sleep regimes and increased instances of poorer sleep routines. Also, it must be noted that poorer sleep routines and sleep disturbances can also be influenced due to various other factors such as life style factors, familial and social factors, individuals' own mental health etc. along with digital consumption and its related attributes. Though a small sample was employed in this study, upcoming research will be able to build a more thorough comprehension of the subject by using larger samples. Only students between the ages of 15 and 24 were included in this study; research involving other age groups and geographic regions will add a new perspective to the subject. Such analogies will facilitate a deeper comprehension of the subject. In conclusion, it can be stated that studies that include variables other than Internet gaming disorder, FOMO, and Sleep Quality will improve the academic literature.

Limitations

In the present study, investigator could enlist several limitations. Primarily, the selected sample was small, and data were collected using convenience sampling method. Hence the results of the selected sample could not be generalised. Also, all the variables under study were assessed through self-reporting questionnaires creating a probable chance of selective biases from the respondents. Also, the study was conducted cross-sectionally and failed to draw any causal inferences about the variables under study.

References

- Achab, S., Nicolier, M., Mauny, F., Monnin, J., Trojak, B., Vandel, P., ... & Haffen, E. (2011). Massively multiplayer online role-playing games: comparing characteristics of addict vs non-addict online recruited gamers in a French adult population. *BMC psychiatry*, 11(1), 1-12.
- Alhassan, A. A., Alqadhib, E. M., Taha, N. W., Alahmari, R. A., Salam, M., & Almutairi, A. F. (2018). The relationship between addiction to smartphone usage and depression among adults: a cross sectional study. *BMC psychiatry*, 18(1), 1-8.
- American Academy of Sleep Medicine. (2005). International classification of sleep disorders. Diagnostic and coding manual, 51-55.
- Andreassen, C. S., Billieux, J., Griffiths, M. D., Kuss, D. J., Demetrovics, Z., Mazzoni, E., & Pallesen, S. (2016). The relationship between addictive use of social media and video games and symptoms of psychiatric disorders: A large-scale cross-sectional study. *Psychology of Addictive Behaviors*, 30(2), 252.
- Brandtzæg, P. B., Lüders, M., & Skjetne, J. H. (2010). Too many Facebook “friends”? Content sharing and sociability versus the need for privacy in social network sites. *Intl. Journal of Human-Computer Interaction*, 26(11-12), 1006-1030.
- Buysse, D. J., Reynolds III, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry research*, 28(2), 193-213.
- Cade, R., & Gates, J. (2017). Gamers and video game culture: An introduction for counselors. *The Family Journal*, 25(1), 70–75. 10.1177/1066480716679809.
- Caplan, S. E. (2003). Preference for online social interaction: A theory of problematic internet use and psychosocial well-being. *Communication Research*, 30(6), 625-648.
- Chang, A. M., Aeschbach, D., Duffy, J. F., & Czeisler, C. A. (2015). Evening use of light-emitting eReaders negatively affects sleep, circadian timing, and next-morning alertness. *Proceedings of the National Academy of Sciences*, 112(4), 1232-1237.
- Chang, S. M., & Lin, S. S. (2019). Online gaming motive profiles in late adolescence and the related longitudinal development of stress, depression, and problematic internet use. *Computers & Education*, 135, 123-137.
- Chassiakos, Radaskey, Christakis, Moreno, Cross, Hill, Ameenuddin, Hutchinson, Levine, Boyd, & Mendelson. (2016, November). Children and Adolescents and Digital Media. *PEDIATRICS*, 138(5). <https://doi.org/10.1542/peds.2016-2593>
- Chattu, V. K., Sakhamuri, S. M., Kumar, R., Spence, D. W., BaHammam, A. S., & Pandi-Perumal, S. R. (2018). Insufficient Sleep Syndrome: Is it time to classify it as a major noncommunicable disease?. *Sleep Science*, 11(2), 56.
- Colarusso CA. *Child and Adult Development: A Psychoanalytic Introduction for Clinicians (Critical Issues in Psychiatry)*. New York, NY: Springer (2013), p. 1992. DOI: 10.1007/978-1-4757-9673-5
- Corey J. Blomfield neira & Bonnie L. Barber. (2014). Social networking site use: Linked to adolescents' social self- concept, self- esteem, and depressed mood, *Australian Journal of Psychology*, 66:1, 56-64, DOI: [10.1111/ajpy.12034](https://doi.org/10.1111/ajpy.12034)
- Desai, R. A., Krishnan-Sarin, S., Cavallo, D., & Potenza, M. N. (2010). Video-gaming among high school students: health correlates, gender differences, and problematic gaming. *Pediatrics*, 126(6), e1414-e1424.

- Dossey, L. (2014). FOMO, digital dementia, and our dangerous experiment. *Explore: The Journal of Science and Healing*, 10(2), 69-73.
- Eaton DK, McKnight-Eily LR, Lowry R, et al. . Prevalence of insufficient, borderline, and optimal hours of sleep among high school students – the United States, 2007. *J Adolesc Health* 2010;46:399–401. 10.1016/j.jadohealth.2009.10.011
- Exelmans L., Bulck J.V.D(2017). Bedtime, shuteye time, and electronic media: Sleep displacement is a two-step process. *J. Sleep Res.* ;**26**:364–370. doi: 10.1111/jsr.12510.
- Fabris, M. A., Marengo, D., Longobardi, C., & Settanni, M. (2020). Investigating the links between Fear of Missing Out, social media addiction, and emotional symptoms in adolescence: The role of stress associated with neglect and negative reactions on social media. *Addictive Behaviors*, 106, 106364.
- Fossum, I. N., Nordnes, L. T., Storemark, S. S., Bjorvatn, B., & Pallesen, S. (2014). The association between use of electronic media in bed before going to sleep and insomnia symptoms, daytime sleepiness, morningness, and chronotype. *Behavioral sleep medicine*, 12(5), 343-357.
- Franchina, V., Vanden Abeele, M., Van Rooij, A. J., Lo Coco, G., & De Marez, L. (2018). Fear of Missing Out as a predictor of problematic social media use and phubbing behavior among Flemish adolescents. *International journal of environmental research and public health*, 15(10), 2319.
- Gezgin, D. M. (2018). Understanding Patterns for Smartphone Addiction: Age, Sleep Duration, Social Network Use and Fear of Missing Out. *Cypriot Journal of Educational Sciences*, 13(2), 166-177.
- Ghekiere A., Van Cauwenberg J., Vandendriessche A., Inchley J., de Matos M.G., Borraccino A., Gobina I., Tynjälä J., Deforche B., De Clercq B (. 2018). Trends in sleeping difficulties among European adolescents: Are these associated with physical inactivity and excessive screen time? *Int. J. Public Health*; **64**:487–498. DOI: 10.1007/s00038-018-1188-1.
- Gradisar, M., Wolfson, A. R., Harvey, A. G., Hale, L., Rosenberg, R., & Czeisler, C. A. (2013). The sleep and technology use of Americans: findings from the National Sleep Foundation's 2011 Sleep in America poll. *Journal of Clinical Sleep Medicine*, 9(12), 1291-1299.
- Griffiths M. Gambling on the internet: a brief note. *J Gambl Stud* 1996; 12 4:471–473.
- Griffiths MD, Davies, MNO (2005) Videogame Addiction: Does It Exist? *Handbook Of Computer Game Studies*. J. Goldstein, J. Raessens (Eds), Boston. MIT Pres, s.359– 68.
- Kharisma, A. C., Fitryasari, R., & Rahmawati, P. D. (2020). Online games addiction and the decline in Sleep Quality of college student gamers in the online game communities in Surabaya, Indonesia. *International Journal of Psychosocial Rehabilitation*, 24(7), 8987-8993.
- Killgore, W. D. (2010). Effects of sleep deprivation on cognition. *Progress in brain research*, 185, 105-129.
- Ko CH, Kiraly O, Demetrovics Z, Chang YM, Yen JY (2020). Identifying individuals in need of help for their uncontrolled gaming: a narrative review of concerns and comments regarding gaming disorder diagnostic criteria. *J Behav Addict.* 9:572–88. DOI: 10.1556/2006.2020.00058
- Kwok, C., Leung, P. Y., Poon, K. Y., & Fung, X. C. (2021). The effects of internet gaming and social media use on physical activity, sleep, quality of life, and academic performance among

- university students in Hong Kong: A preliminary study. *Asian Journal of Social Health and Behavior*, 4(1), 36.
- Li, L., Griffiths, M. D., Mei, S., & Niu, Z. (2020). Fear of Missing Out and smartphone addiction mediates the relationship between positive and negative affect and Sleep Quality among Chinese university students. *Frontiers in Psychiatry*, 11, 877.
- Manzar, M. D., Moiz, J. A., Zannat, W., Spence, D. W., Pandi-Perumal, S. R., BaHammam, A. S., & Hussain, M. E. (2015). Validity of the Pittsburgh sleep quality index in Indian university students. *Oman medical journal*, 30(3), 193.
- M. Ansari, Y. Alas, G. Hardaker, J.H. Jaidin, M. Smith, A.D. Ahad.(2016). Smartphone habit and behavior in Brunei: personalization, gender, and generation gap *Comput. Hum. Behav.*, 64 , pp. 719-727
- Magson NR, Freeman JYA, Rapee RM, Richardson CE, Oar EL, Fardouly J. Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. *J Youth Adolesc.* (2021) 50:44–57. DOI: 10.1007/s10964-020-01332-9
- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of cardiac anaesthesia*, 22(1), 67–72. https://doi.org/10.4103/aca.ACA_157_18
- O'reilly, M., Dogra, N., Whiteman, N., Hughes, J., Eruyar, S., & Reilly, P. (2018). Is social media bad for mental health and wellbeing? Exploring the perspectives of adolescents. *Clinical child psychology and psychiatry*, 23(4), 601-613.
- Prot S, Anderson CA, Gentile DA et al (2014) The Positive And Negative Effects Of Video Game Play. *Children And Media*. A. Jordan, D. Romer (Eds) New York. Oxford University Press. 109-28.
- Pontes, H. M., & Griffiths, M. D. (2015). Measuring DSM-5 Internet Gaming Disorder: Development and validation of a short psychometric scale. *Computers in Human Behavior*, 45, 137-143. doi:10.1016/j.chb.2014.12.006
- Przybylski, A. K., Weinstein, N., & Murayama, K. (2017). Internet gaming disorder: Investigating the clinical relevance of a new phenomenon. *American Journal of Psychiatry*, 174(3), 230-236.
- Reed, G. M., First, M. B., Billieux, J., Cloitre, M., Briken, P., Achab, S., ... & Bryant, R. A. (2022). Emerging experience with selected new categories in the ICD- 11: Complex PTSD, prolonged grief disorder, gaming disorder, and compulsive sexual behaviour disorder. *World Psychiatry*, 21(2), 189-213.
- Rehbein, F., Kliem, S., Baier, D., Mößle, T., & Petry, N. M. (2015). Prevalence of Internet Gaming Disorder in German adolescents: Diagnostic contribution of the nine DSM- 5 criteria in a state- wide representative sample. *Addiction*, 110(5), 842-851.
- Su, W., Han, X., Yu, H., Wu, Y., & Potenza, M. N. (2020). Do men become addicted to internet gaming and women to social media? A meta-analysis examining gender-related differences in specific internet addiction. *Computers in Human Behavior*, 113, 106480.
- Szymkowiak, Melović, Dabić, Jeganathan, & Kundi. (2021, May). Information technology and Gen Z: The role of teachers, the internet, and technology in the education of young people. *Technology in Society*, 65. <https://doi.org/10.1016/j.techsoc.2021.101565>

- Thomas, A. C., Allen, F. L., Phillips, J., & Karantzas, G. (2011). Gaming machine addiction: The role of avoidance, accessibility and social support. *Psychology of Addictive Behaviors*, 25(4), 738–744. <https://doi.org/10.1037/a0024865>
- Torous, J., Bucci, S., Bell, I. H., Kessing, L. V., Faurholt- Jepsen, M., Whelan, P., ... & Firth, J. (2021). The growing field of digital psychiatry: current evidence and the future of apps, social media, chatbots, and virtual reality. *World Psychiatry*, 20(3), 318-335.
- Walsh, White, & Young. (2008, December 10). The phone connection: A qualitative exploration of how belongingness and social identification relate to mobile phone use amongst Australian youth. *Journal of Community & Applied Social Psychology*, 19(3), 225–240. <https://doi.org/10.1002/casp.983>
- Watkins, S. C. (2009). *The young and the digital: What the migration to social-network sites, games, and anytime, anywhere media means for our future*. Beacon Press.
- World Health Organization. (2019). *The 11th revision of the international classification of diseases*. Geneva: WHO.
- Wyche, S., & Baumer, E. P. (2017). Imagined Facebook: An exploratory study of non-users' perceptions of social media in rural Zambia. *New media & society*, 19(7), 1092-1108.
- Zaman, M., Babar, M. S., Babar, M., Sabir, F., Ashraf, F., Tahir, M. J., ... & Pakpour, A. H. (2022). Prevalence of gaming addiction and its impact on Sleep Quality: A cross-sectional study from Pakistan. *Annals of Medicine and Surgery*, 78, 103641.