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Research paper

An Epidemiological Study and the Effect of Motivational Enhancement Therapy Among Medical Students Having Internet Addiction

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Abstract

Internet addiction has been defined as a severe preoccupation, urges, or behaviours to use the internet, causing distress. Psychiatric comorbidities associated are impulse control disorders, anxiety, depression, and overconsumption of pornographic materials. Some psychosocial interventions have been applied, but no uniform guideline has been formulated to date. Motivational enhancement therapy has proved to be an extremely efficient technique in curbing internet addiction. The study was a cross-sectional study subjects were selected through purposive sampling. Internet addiction test, Smartphone addiction scale, and general health questionnaires were used to screen the students. Pre-assessment was done to find out the associated psychopathology with internet addiction, and suspected cases of moderate to severe internet addiction group were taken for further intervention using MET, followed by post-assessment. Among subjects who used internet for >2years 15.6% had high risk of smart phone addiction, 30.8% had smart phone addiction, 12.4% had moderate internet addiction and 3.6% had severe internet addiction which was far more higher than subjects using internet for lesser duration It was evident that the scores of partici-pants on the scales of IAT, SAS and GHQ28 before and after MET had significantly reduced. This tells us that MET has a significant effect in reducing moderate to severe internet addiction, leading to a decrease in distress. Smartphone addiction goes hand in hand with internet addiction, so they both should be addressed together. MET is an effective modality of therapy for internet addiction, but more detailed studies are needed to understand the intricacies of it.

Keywords: *Internet addiction; Motivational Enhancement Therapy; IAT; SAS; GHQ-28.*

1. Introduction

Addiction is a word coming from the Latin word “addictus”, meaning devoted to a thing with inability to choose freely or becoming a slave. Recently, the term addiction has been extended beyond substance use disorder to non-substance-related addictions1. Addiction to the internet has put them alongside substance use disorders, whereas others have linked them to obsessive-compulsive disorders or impulse control disorders 2. Various names describe this phenomenon, like compulsive use of the computer, pathological use of the internet, problematic use of the internet, internet dependency, internet addiction, and even internetomania 3. Addiction to the internet is an indication of underlying psychological distress; hence, its merit as an individual psychiatric disorder is a matter of question. Onset occurs in the late 20s or early 30s, a lag of a decade or more from initiation of use to using a computer problematically can happen. Co-morbid issues like mood, anxiety, impulse control, and substance intake are common6. No one knows the etiology, but psychological, neurobiological, and cultural factors seem to be involved 7. Although Motivational Enhancement Therapy has proven efficacy in substance use disorders, its use in internet addiction is sparse 8. This internet addiction disorder is a compulsive–impulsive spectrum 9. It is associated with withdrawal, feeling angry, restlessness, and depression when computer access is denied. Tolerance in the form that needs better computer accessories, more screen time, and more time on social media occurs at 10.

In internet addiction, users are increasing their time online to feel satisfied, due to being unable to go online, withdrawal symptoms like restlessness, mood swings, and intrusive fantasizing about the internet occur 10 12. In South Korea, there have been lots of deaths by cardiopulmonary failures in cyber cafes, and a lot of adolescents are dropping out of school to get involved in internet gaming. These activities are an indicator of how alarming the situation has become, and proper diagnosis and management of internet addiction is required (13-15). There have been many case reports of people developing psychopathology due to stopping internet use, such as insomnia, anxiety, irritability, depression, and psychotic breakdown (a rare occurrence)16.

There has been a major fall in patients’ academic performance, occupation, and regular relationships due to the problematic use of the internet. Different types of Internet addiction17.

- Sex-the subject uses internet to view porn resulting in neglect of sexual activities with partner
- Making relation-subject chats to build online relationships, ignoring family and friends
- Games-subject excessively engaging in gaming, gambling, causing monetary problems
- To know facts, the subject inquisitively looks for data
- Social networking- the subject constantly monitors social networking sites.

Theories of Internet addiction

- Personality issues- the subject has personality issues which make them vulnerable to substance abuse, gambling, internet addiction etc.
- Shyness-shy people choose anonymous profiles on the internet to express themselves
- Biological-using the internet causes a surge in dopamine and serotonin levels in the brain
- Escapism-internet is so mesmerizing that the subject forgets the reality of problems and negative emotions while being online
- Instant gratification-search engines help users find things easily(information, gambling, pornography).This encourages them to stay online 18.

Use of psychological and pharmacotherapy methods has been suggested for internet addiction, but no uniform consensus has been achieved for managing internet addiction. Motivational enhancement therapy has been successful in increasing motivation and decreasing internet use behaviours. Use of motivational enhancement therapy in internet addiction was found to be as effective as substance use disorders, but more studies must be done to find the real-world efficacy19.

Motivational enhancement therapy is a short-term psychotherapy designed for enhancing motivation in substance use disorders and is derived from a manual-based Motivational interviewing version. The focus is mostly on the use of empathy by the therapist, accepting and respecting a client's prospective20. It's different from client-centred therapy in that it uses specific strategies to change behaviour, side by side, supporting the client at every step 21. The therapist focuses the client's attention on where they are and where they want to be, and this helps in developing discrepancies leading to behaviour change22. Although MET has been widely used for drug-related problems, its use in internet addiction is still foggy, as the full dimensions of internet addiction are still to be revealed 23. Currently, no universal management guidelines have been brought up, but MET and MET-CBT have shown promising responses. As the world of digitisation is progressing, the need for finding more effective intervention models is necessary to prevent the negative outcomes of internet use. To date, only a few therapies have emerged apart from MET AND MET-CBT, like group therapy, along with readiness to change. And only therapy group counselling programs are being conducted.

a) Aim and Objectives of the Study: This study aims to determine the relationship of smartphone addiction to key psychological attributes, particularly coping skills, resilience, and personality traits, of undergraduate students.

Objectives:

- To assess the coping strategies employed by individuals suffering from smartphone addiction.
- To evaluate the resilience levels of individuals addicted to smartphones.
- To examine the predominant personality traits among individuals with smartphone addiction.

The study will determine the effect that smartphone overuse has on those psychological factors when comparing coping, resilience, and personality traits in an individual addicted to smartphones to those of a healthy individual.

The study will test the following hypotheses:

- There exist abnormal coping strategies among individuals with smartphone addiction, characterized by maladaptive behavioral patterns.
- Individuals with smartphone addiction exhibit poorer resilience compared to healthy individuals, indicating a reduced ability to adapt to stress and adversity.
- Certain personality traits, such as low self-control or high neuroticism, are more prevalent among individuals prone to smartphone addiction.

2. Materials and methods

The study was conducted among medical students at a tertiary care center in Cuttack, Odisha, India. Participants for the initial assessment were selected using purposive sampling, while the allocation of samples for the intervention was done using a computer-generated random number table. The sample size was determined using a minimum sample size calculator, based on the anticipated prevalence of moderate to severe internet addiction in India, reported as 19.85% in previous studies.

The following mathematical method was used:

$$n = z^2_{1-\propto/2} P(1 - P)/d^2$$

Where n = Minimum sample size

$z^2_{1-\propto/2}$ = value of the standard normal variant for $1-\propto/2$ level of significance, at 5% type I error, it is 1.96

P =Expected proportion in population based on previous studies

$100(1-\propto)\%$ = Confidence level

The absolute error or precision required on either side of the population.

In this study, the following values of the above parameters have been considered, keeping in view the frequency of availability of the cases in the study hospital.

i) Confidence level $=1-\propto =95\%$

ii) Anticipated population proportion P=19.85%

iii) Absolute precision d = 5% point

(1.96)2 x 0.19(1-0.19)

(0.05)2

After applying the formula, the sample size required is computed at 236. Assuming 5% have inadequate data or won't give consent, i.e., 11. So, a sample size of 250 was decided to be taken. The study sample consisted of 250 medical students

Inclusion criteria

1) Medical students studying in the institute.
2) Those who will give informed consent
3) Age group ranging from 18-30 years

4) Those using the internet for at least 6 months
Exclusion criteria
1) Those having a past diagnosed psychiatric disorder
2) Those having any long-standing major medical illness
3) Those who give incomplete and non-corroborative responses on questionnaires
Tools Used
Semi-structured pre-form containing socio-demographic details and internet use
Internet addiction test (Young, 1998) 43
SAS-SV (Kwon, Kim et al,2013) Smartphone Addiction Scale short version44
GHQ 28General health questionnaire
MET (Motivational Enhancement Therapy)-4 SESSIONS. Pre & and post-assessments were done.
All statistical analyses will be performed using SPSS Statistics software 26, and a significance level of 0.5 was adopted throughout.

3. Result

On comparing data of smartphone usage patterns of males and females, it was found that males used smartphones for messaging, clicking photographs, playing games, and surfing the internet more frequently than females, whereas females used smartphones more often for calling (Table 1).

Table 1: Comparison of Patterns Used by Males and Females

PATTERN	MALE(%)	FEMALE(%)
CALLING	36	40
MESSAGING	38	34
CAMERA	24	20
GAMES	42	27
INTERNET SURFING	50	49

In our study, we found that 34.4% of the population had no internet addiction, whereas 34% had mild,26% had moderate, and 5.6%had severe percentage of internet addiction (Figure 1).

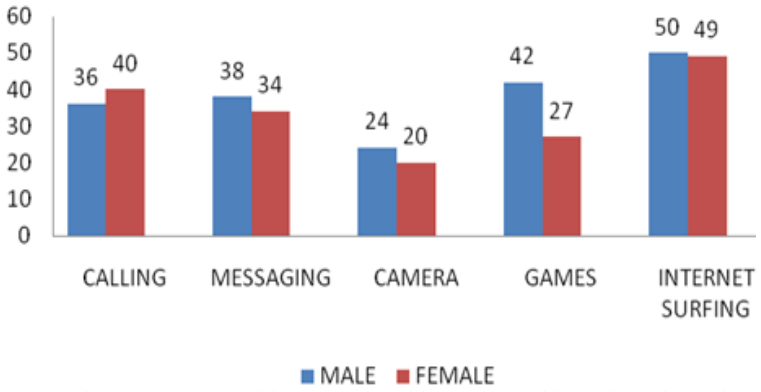

Fig. 1: The Representation of the Comparison of Patterns Used by Males and Females.

In our study, we found that 21.6% of our sample population had no addiction, whereas 29.2% and 49.2% had high risk and addiction to smartphones, respectively (Figures 2,3).

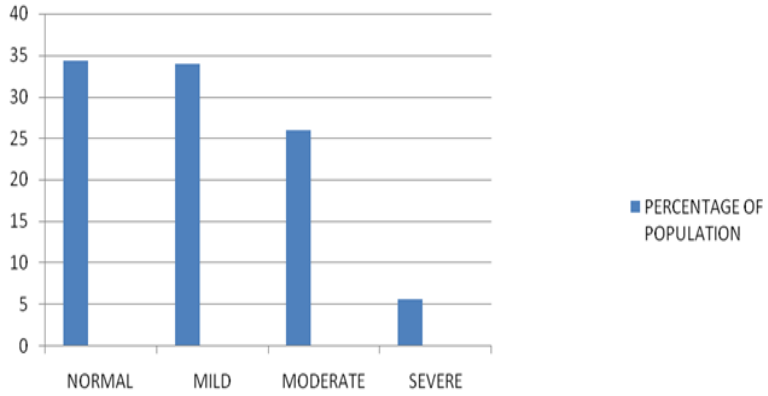

Fig. 2: Percentage of the Population with Different Stages of Internet Addiction.

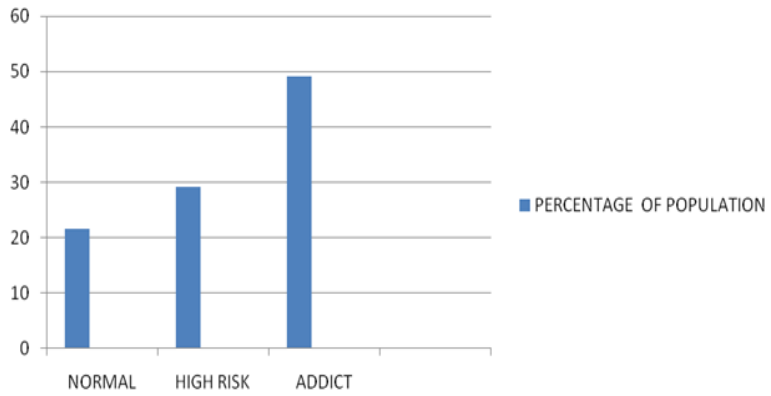

Fig. 3: Percentage of Population with Different Stages of Smartphone Addiction.

The main purpose of this study was to investigate the effectiveness of MET on subjects having moderate to severe internet addiction and to measure the distress due to internet dependence (Table 2).

Table 2: Effectiveness of MET Analysis Using Different Scales

SCORES USING DIFFERENT SCALES	MEAN	STANDARD DEVIATION
PRE MET SAS SCORE	1.80	0.53
POST MET SAS SCORE	1.26	0.70
PRE MET IAT SCORE	3.20	0.41
POST MET IAT SCORE	1.69	0.87
PRE MET GHQ28	0.77	0.43
POST MET GHQ28	0.26	0.45

From the above findings, it is evident that the scores of participants on the scales of IAT, SAS, and GHQ28 before and after MET were significantly different. This tells us that MET has a significant effect in reducing moderate to severe internet addiction and also in decreasing distress as indicated by GHQ28.On analysis, we found that there was a significant difference in scores of subjects pre-MET and post-MET (Table 3).

Table 3: Effectiveness of MET Using Degree of Freedom and T-Value

GROUPS	df	t
PRE MET SAS SCORE	34	20.04*
POST MET SAS SCORE	34	10.62*
PRE MET IAT SCORE	34	46.65*
POST MET IAT SCORE	34	11.51*
PRE MET GHQ28	34	10.71*
POST MET GHQ28	34	3.45*

On comparing males and females in our study, it was found that there was a significant difference among IAT and SAS scores, but both genders scored nearly equally on GHQ-28 scores (Table 4).

Table 4: Effectiveness of MET Using Different Scales Among Males and Females

GROUPS	MALE		FEMALE		COMBINED	
	MEAN	STANDARD DEVIATION	MEAN	STANDARD DEVIATION	MEAN	STANDARD DEVIATION
IAT	2.18	0.857	1.85	0.845	2.02	0.865
SAS	1.49	0.689	1.12	0.844	1.30	0.791
GHQ28	0.70	0.461	0.57	0.498	0.64	0.483

4. Discussion

Internet addiction is a very worrying phenomenon in this world of digitalization. In this world where people have thousands of friends online but are still, by and large, lonely inside, they find the INTERNET as their only friend. Some people find the internet to be a source of escape from this fake and stressful work and social environment. In this world of digitalization, the “humane touch” is missing, which has led to an increase in loneliness and poor coping skills among adolescents and adults 24. We took up this study to probe into the reason for distress and its relationship with the use of the internet or a smartphone. Our study suggests that this protocol for motivational enhancement therapy in patients with internet addiction was an effective strategy. Remarkable improvement in the form of reduction of internet addiction scores because of the involvement of the caregiver in the therapy, 25. It also recommended that when a mental health condition, such as anxiety, depression, or stress, has led a subject to turn to the internet for relaxation, a therapist may work to treat the addiction by treating first the mental health condition 26.

In China, internet addiction treatment boot camps have also been created, and this country also has strict laws to regulate the number of hours young people can use the internet 27. In our study, we found that during the initial rapport-building stage of the met, the subjects mostly had their motivation at the contemplation stage, 28. During these sessions, it was found that their motivation progressed towards the preparation stage. when the desire to use the internet or a smartphone caused emotional and physical arousal, the subject was advised to practice standard relaxation techniques. As the sessions progressed, the client was encouraged to focus on his intention, often engaging in playing games more than his intention, and the routine behaviours promoting it 29. There was a marked improvement, and therapy was terminated after the fourth session when changes consolidated. On analyzing the thoughts in the diary of the clients, we found that most of them felt lonely, lethargic, worthless, and using a smartphone made them forget these, but after stopping browsing the internet or a smartphone, these emotions resurfaced again. We also found most of them use the internet and smartphones unconsciously, and clients

admitted that MET sessions helped them understand which behaviours while using smartphones and the internet led to addiction. MET also treats co-occurring mental conditions associated with internet addiction, most commonly of which were found in our study, were anxiety and depression. According to IPS MET (4 Sessions), or brief motivational intervention along with CBT, could be used 30.
In our study, we found that those who had moderate to severe internet addiction had higher scores on GHQ-28 when compared to those who didn't have internet addiction. This is comparable to a study conducted by Jaishy et al., 2023, 31..It was also found that the level of distress was similar in both males and females 32. It was studied that higher time spent on the internet was associated with decreased psychosocial life quality 31. It was found that those having moderate to severe internet addiction have lower self-esteem, poorer social relationships. Relationship between genetics and personality factors 33. As internet addiction increases, the time spent online also increases, and this is attributed to various neurological changes 34. In our study, we also found that subjects having a higher risk of smartphone addiction had a greater amount of distress on the GHQ-28. It has also been found that PMPU (problematic mobile phone users) leads to multiple problems, including sleep, failure in academics, distress interpersonally, and anxiety issues. Generating and maintaining distorted cognitions towards mobile phones was predicted by distress in psychological well-being, causing PMPU 35. People having anxiety turn towards a suitable environment and engage in online activities36. People used these online apps because of their anonymity and ability to decrease distress. In our study, due to high competition among students and a hectic curriculum, using smartphones and the internet helps them escape reality temporarily. It helps people discover special talents (playing online games, dating apps), which satisfy their sense of achievement. Controlling urges to use the internet consciously attenuates the negative cognitions on PMPU 37. In our study, subjects using the internet for more than 2 years were at higher risk of smartphone addiction and internet addiction. This study had results comparable to those of Senormancio et al., 124, Grover et al., 125, and Nitin Anand et al., 38-39. Our study found that males used the internet for their unmet social media urges, which is what was found by Rakhmawati et al 40. In this study, we found how significant the impact of digital media is on psychological health, which is consistent with what was found by Anil Bhukya et al 41.

5. Limitations

1) Single-Center, Homogeneous Sample: Conducted at one tertiary care teaching hospital in eastern India, the findings may not generalize to medical students in other regions, cultures, or types of institutions.
2) Cross-Sectional Baseline Design: The initial assessment of internet and smartphone use relied on a cross-sectional snapshot, limiting causal inferences about usage patterns or their determinants.
3) Self-Report Measures: Reliance on self-administered questionnaires (IAT, SAS-SV, GHQ-28) introduces potential reporting and recall biases, especially in socially sensitive domains like addiction.
4) Sample Size and Gender Distribution: A relatively modest overall sample and any imbalance in the male-to-female ratio may reduce statistical power for subgroup analyses and obscure more nuanced gender differences.
5) Lack of Long-Term Follow-Up: Post-intervention improvements were measured immediately after MET, without extended follow-up. While MET showed promise, the study did not include a randomized comparison to another structured intervention (e.g., cognitive-behavioral therapy) or an attention-matched control, limiting conclusions about MET's relative efficacy.

6. Conclusion

The present study highlights a considerable prevalence of internet addiction among MBBS students in a tertiary care centre in eastern India, with distinct patterns of internet and smartphone usage between males and females. Males demonstrated significantly higher engagement with social networking, online gaming, knowledge-seeking, and shopping, while females primarily used the internet for entertainment. Similarly, smartphone use varied, with males using it more for messaging, gaming, and internet browsing, and females predominantly using it for calls. Internet access was highest during the evening and night, with males showing greater usage throughout the day. Importantly, the study demonstrated that Motivational Enhancement Therapy (MET) led to significant improvement in internet addiction, smartphone addiction, and overall psychological well-being, as reflected in the post-intervention scores of IAT, SAS-SV, and GHQ-28. These findings emphasize the need for early identification and targeted interventions, like MET, to address internet addiction and its associated psychopathology among medical students.

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Conflict of interest

The authors declare they have no conflict of Interest among themselves.

Ethics approval

The study has been approved by the instructional ethical committee with the approval letter number IEC/IRB No.845/14.01.19

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