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Original Research Article

SCREEN TIME, SCREEN ADDICTION, PHYSICAL ACTIVITY, AND BODY MASS INDEX AMONG ADULT PATIENTS WITH DEPRESSION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Depression is associated with substantial functional impairment and may coexist with unhealthy lifestyle behaviours, including excessive screen use, physical inactivity, and adverse weight status. However, the interrelationship of these factors among clinically diagnosed adults with depression remains insufficiently explored. This study aimed to assess screen time, screen addiction, physical activity, and body mass index (BMI) among adults with depression and to examine their association with depression severity and selected sociodemographic variables. **Materials and Methods**: A hospital-based cross-sectional study was conducted over 18 months in the Department of Psychiatry, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh. A total of 107 adults aged 18–65 years diagnosed with depression according to ICD-10 criteria were recruited using purposive sampling. Depression severity was assessed using the 17-item Hamilton Depression Rating Scale (HAM-D). Screen exposure, multiscreen addiction, and physical activity were assessed using the Screen Time Questionnaire, Multiscreen Addiction Scale, and International Physical Activity Questionnaire, respectively. BMI was calculated from measured height and weight. Pearson's correlation analysis was used to assess associations between HAM-D scores and lifestyle variables, with statistical significance set at $p<0.05$. **Results**: The mean daily screen time was 397.06 ± 122.95 minutes, while the mean multiscreen addiction score was 50.00 ± 8.48. The mean physical activity level was 2671.36 ± 689.73 MET-min/week, mean BMI was 25.89 ± 3.14 kg/m², and mean HAM-D score was 14.78 ± 5.70. Mild depression was the most common severity category (50.5%), followed by moderate (27.1%), very severe (15.0%), and severe depression (7.5%). Most participants had moderate physical activity (57.0%), while 28.0% were overweight and 13.1% were obese. Depression severity demonstrated significant positive correlations with screen time ($r=0.633$, $p<0.001$), multiscreen addiction ($r=0.911$, $p<0.001$), and BMI ($r=0.820$, $p<0.001$), whereas physical activity showed a significant negative correlation with depression severity ($r=-0.677$, $p<0.001$). **Conclusion**: Greater depression severity was significantly associated with increased screen time, higher multiscreen addiction, and higher BMI, while greater physical activity was associated with lower depression severity. These findings highlight the importance of incorporating assessment of screen use, physical activity, and weight status into the routine clinical evaluation of adults with depression. Lifestyle-based interventions addressing these modifiable factors may serve as useful adjuncts to conventional treatment approaches.

INTRODUCTION

Depression is one of the most common and disabling psychiatric disorders worldwide, contributing substantially to morbidity, impaired functioning, and reduced quality of life. The burden of depressive disorders has increased considerably over recent decades, with the Global Burden of Disease (GBD) Study reporting a rise from approximately 170.8

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million cases in 1990 to 279.6 million cases in 2019. Depression has consistently ranked among the leading causes of years lived with disability and is projected to become one of the foremost contributors to disability-adjusted life years globally. In addition to its impact on affected individuals, depression places a considerable burden on healthcare systems, accounting for nearly one-quarter to one-third of primary care consultations for mental health conditions.[1]

Rapid technological advancement has led to unprecedented use of smartphones, computers, tablets, and other digital devices, making screen-based activities an integral part of daily life. Although these technologies have improved communication, education, and access to information, prolonged screen exposure has also resulted in increased sedentary behaviour and reduced physical activity. These behavioural changes have emerged as important public health concerns because of their association with adverse physical and mental health outcomes. 3 Screen time encompasses the total duration spent using screen-based devices, whereas screen addiction represents a maladaptive pattern of excessive and compulsive screen use that interferes with social, occupational, and psychological functioning. Growing evidence suggests that excessive screen use and problematic digital device use are associated with increased psychological distress, anxiety, and depressive symptoms.[4,5]

Regular physical activity is recognised as an important determinant of both physical and mental well-being. It improves mood through neurobiological mechanisms, including modulation of neurotransmitters, reduction of systemic inflammation, and enhancement of neuroplasticity, while also promoting better self-esteem and social functioning. Consequently, physical activity is recommended as an effective adjunctive intervention in the management of depression and may provide benefits comparable to pharmacological and psychological therapies in selected individuals. 6,7 Body mass index (BMI), another important lifestyle indicator, has also demonstrated a complex bidirectional relationship with depression. Excess body weight may increase the risk of depressive symptoms through metabolic, inflammatory, and psychosocial mechanisms, whereas depression itself may contribute to unhealthy lifestyle behaviours that promote weight gain.[8]

Although previous studies have independently investigated screen time, screen addiction, physical activity, and BMI in relation to depression, evidence evaluating these lifestyle factors simultaneously among clinically diagnosed adults with depression remains limited. Understanding their interrelationship may facilitate the development of comprehensive lifestyle-based interventions that complement conventional treatment approaches. Therefore, the present study aimed to assess screen time, screen addiction, physical activity, and body mass index among adult patients with depression and to examine their association with selected sociodemographic variables.

MATERIALS AND METHODS

Study design and setting: A hospital-based cross-sectional study was conducted in the Department of Psychiatry, PES Institute of Medical Sciences and Research (PESIMSR), Kuppam, over a period of 18 months. The study included adult patients diagnosed with depression attending the psychiatry outpatient and inpatient services.

Study population and sample size: A total of 107 adult patients with depression were enrolled using purposive sampling. The sample size was calculated based on the mean and standard deviation reported by Yu et al., with an expected prevalence of 16.3%, 95% confidence interval, and 7% precision, yielding a minimum sample size of 107 participants.[9]

Eligibility criteria

Inclusion criteria

- Adults aged 18–65 years.
- Patients diagnosed with depression according to the International Classification of Diseases, Tenth Revision (ICD-10) (F32.0–F32.2, F33.0, F33.1, and F34.1).

Exclusion criteria

- Individuals with cognitive impairment or intellectual disability affecting reliable assessment.
- Pregnant women.
- Patients with other psychiatric disorders or depressive disorders with psychotic symptoms.
- Patients with medical conditions influencing body mass index (e.g., severe physical disability, hypothyroidism, or polycystic ovarian syndrome).
- Individuals with substance abuse or dependence.

Study instruments: A structured proforma was used to collect sociodemographic variables including age, sex, educational status, occupation, monthly income, religion, residence, family type, and marital status, along with clinical variables such as duration of illness, family history, and past history of depression. Depression severity was assessed using the 17-item Hamilton Depression Rating Scale (HAM-D), a clinician-administered instrument widely used to evaluate the severity of depressive symptoms. Participants were categorized as having no depression (0–7), mild (8–13), moderate (14–18), severe (19–22), or very severe depression (>23).[10]

Screen exposure was assessed using the 18-item Screen Time Questionnaire, which measures the average duration of use of televisions, television-connected devices, computers/laptops, smartphones, and tablets during weekdays, weeknights, and weekends.[11]

Problematic digital device use was evaluated using the Multiscreen Addiction Scale (MSAS), a 15-item instrument assessing excessive screen use, compulsive behaviour, and loss of control. Responses

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were scored on a five-point Likert scale, with higher scores indicating greater screen addiction.[12]

Physical activity was assessed using the International Physical Activity Questionnaire (IPAQ). Physical activity was expressed as metabolic equivalent (MET)-minutes per week, and participants were classified into low, moderate, or high physical activity levels according to standard IPAQ guidelines.[13]

Body weight and height were measured using standard anthropometric procedures, and body mass index (BMI) was calculated as weight (kg)/height (m^2). Participants were categorized as underweight (<18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25.0–29.9 kg/m^2), or obese (≥30.0 kg/m^2) according to the World Health Organization classification.[14]

Data collection procedure: Eligible participants were recruited after obtaining written informed consent. Sociodemographic and clinical information was collected using a structured proforma. Subsequently, the HAM-D, Screen Time Questionnaire, MSAS, and IPAQ were administered by the investigator. Anthropometric measurements were obtained to calculate BMI. Data collection required approximately 45 minutes for each participant.

Statistical Analysis: Data were entered into Microsoft Excel and analysed using IBM SPSS Statistics version 26.0. Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Independent-samples t-tests were used to compare continuous variables between groups, while Pearson's correlation analysis was performed to examine relationships among depression severity, coping strategies, behavioural addiction measures, and social media use variables. Variables demonstrating significant associations were entered into multivariable linear regression models to identify independent predictors of problematic social media use and social media integration. A two-tailed p value of <0.05 was considered statistically significant.

Ethical considerations: The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Approval was obtained from the Institutional Ethics Committee of PES Institute of Medical Sciences and Research, Kuppam, before commencement of the study. Written informed consent was obtained from all participants prior to enrolment.

RESULTS

A total of 107 adults with depression were included in the study.

[Table 1] presents the sociodemographic profile of the study participants. The largest proportion of participants belonged to the 21–30 years age group (38.3%), followed by those aged 31–40 years (34.6%) and 41–50 years (27.1%). Males constituted 51.4% of the study population, while females accounted for 48.6%. Regarding educational status, illiterate participants and those with intermediate/diploma education each represented 26.2% of the sample. Nearly one-third of the participants were unemployed (29.9%), while the remaining participants were almost equally distributed among skilled, semiskilled, and unskilled occupations. More than half of the participants resided in rural areas (55.1%), and the majority belonged to nuclear families (81.3%). Approximately half of the study population was married (50.5%), followed by single (29.9%) and divorced participants (16.8%).

Table 1: Sociodemographic Characteristics of Study Participants (N = 107)

Variable	Category	n (%)
Age (years)	21–30	41 (38.3)
	31–40	37 (34.6)
	41–50	29 (27.1)
Gender	Male	55 (51.4)
	Female	52 (48.6)
Education	Illiterate	28 (26.2)
	Primary school	14 (13.1)
	Middle school	20 (18.7)
	High school	17 (15.9)
	Intermediate/Diploma	28 (26.2)
Occupation	Unemployed	32 (29.9)
	Unskilled	24 (22.4)
	Semiskilled	25 (23.4)
	Skilled	26 (24.3)
Residence	Rural	59 (55.1)
	Semi-urban	48 (44.9)
Family Type	Nuclear	87 (81.3)
	Joint	20 (18.7)
Marital Status	Married	54 (50.5)
	Single	32 (29.9)
	Divorced	18 (16.8)
	Widow/Widower	3 (2.8)

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Table 2: Clinical and Behavioral Characteristics of Participants (N = 107)

Variable	Mean ± SD
Screen Time (minutes/day)	397.06 ± 122.95
Multiscreen Addiction Score	50.00 ± 8.48
Physical Activity (MET-min/week)	2671.36 ± 689.73
Body Mass Index (kg/m²)	25.89 ± 3.14
HAM-D Score	14.78 ± 5.70
Duration of illness (months)	5.59 ± 5.87

[Table 2] summarizes the clinical and behavioral characteristics of the study participants. The mean daily screen time was 397.06 ± 122.95 minutes, indicating substantial exposure to screen-based devices. The mean multiscreen addiction score was 50.00 ± 8.48, while the average physical activity level measured using IPAQ was 2671.36 ± 689.73 MET-minutes/week. The mean BMI was 25.89 ± 3.14 kg/m², suggesting that the average participant was within the overweight category according to WHO classification. The mean HAM-D score was 14.78 ± 5.70, indicating that most participants had mild to moderate depressive symptoms. The average duration of illness was 5.59 ± 5.87 months.

Table 3: Distribution of Depression Severity, Physical Activity and BMI

Variable	Category	n (%)
Depression Severity	Mild	54 (50.5)
	Moderate	29 (27.1)
	Severe	8 (7.5)
	Very severe	16 (15.0)
Physical Activity	Low	12 (11.2)
	Moderate	61 (57.0)
	High	34 (31.8)
BMI Category	Normal	63 (58.9)
	Overweight	30 (28.0)
	Obese	14 (13.1)

[Table 3] shows the distribution of participants according to depression severity, physical activity level, and BMI category. Mild depression was the most common category, affecting 50.5% of participants, followed by moderate depression (27.1%), very severe depression (15.0%), and severe depression (7.5%). With respect to physical activity, the majority of participants demonstrated moderate physical activity (57.0%), whereas 31.8% reported high levels and 11.2% had low physical activity. Based on BMI classification, 58.9% of participants had a normal BMI, while 28.0% were overweight and 13.1% were obese.

Table 4: Device-wise Screen Use During Weekdays and Weekends Among Study Participants (N = 107)

Device	Duration	Weekdays n (%)	Weekends n (%)
Television	<1 hour	49 (45.79)	99 (92.52)
	1–2 hours	41 (38.32)	7 (6.54)
	2–4 hours	17 (15.89)	1 (0.93)
TV-connected devices	0 min	1 (0.93)	5 (4.67)
	<1 hour	97 (90.65)	102 (95.33)
	1–2 hours	8 (7.48)	0 (0.00)
	2–4 hours	1 (0.93)	0 (0.00)
Laptop/Computer	<1 hour	69 (64.49)	103 (96.26)
	1–2 hours	27 (25.23)	4 (3.74)
	2–4 hours	11 (10.28)	0 (0.00)
Smartphone	<1 hour	22 (20.56)	75 (70.09)
	1–2 hours	45 (42.06)	31 (28.97)
	2–4 hours	37 (34.58)	1 (0.93)
	>4 hours	3 (2.80)	0 (0.00)
Tablet	0 min	24 (22.43)	21 (19.63)
	<1 hour	79 (73.83)	86 (80.37)
	1–2 hours	4 (3.74)	0 (0.00)

[Table 4] describes the pattern of screen device use during weekdays and weekends. On weekdays, smartphones were the most frequently used screen-based devices, with 42.1% of participants reporting 1–2 hours of use and 34.6% reporting 2–4 hours of daily use. Television viewing was comparatively moderate, whereas the use of laptops/computers, tablets, and TV-connected devices remained predominantly below one hour per day. During weekends, screen use generally declined across all devices. Most participants reported less than one hour of television (92.5%), laptop/computer (96.3%), TV-connected device (95.3%), and tablet (80.4%) use. Although smartphone use also decreased during weekends, it remained the most commonly used screen-based device, indicating that smartphones

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constituted the primary source of screen exposure among the study participants.

Table 5: Correlation Between Depression Severity (HAM-D) and Lifestyle Variables (N = 107)

Variable	Pearson correlation coefficient (r)	P value
Screen Time Questionnaire (STQ)	0.633	<0.001
Multiscreen Addiction Scale (MSA)	0.911	<0.001
International Physical Activity Questionnaire (IPAQ)	–0.677	<0.001
Body Mass Index (BMI)	0.820	<0.001

[Table 5] presents the correlation between depression severity and selected lifestyle variables. HAM-D scores demonstrated a strong positive correlation with screen time ($r = 0.633$, $p < 0.001$), indicating that greater screen exposure was associated with increased severity of depressive symptoms. An even stronger positive correlation was observed between HAM-D scores and multiscreen addiction ($r = 0.911$, $p < 0.001$), suggesting a close association between problematic screen use and depression severity. Body mass index also showed a strong positive correlation with HAM-D scores ($r = 0.820$, $p < 0.001$), indicating that higher BMI was associated with greater depressive symptom severity. Conversely, physical activity demonstrated a strong negative correlation with HAM-D scores ($r = –0.677$, $p < 0.001$), suggesting that higher levels of physical activity were associated with lower depression severity.

DISCUSSION

The present study evaluated screen time, multiscreen addiction, physical activity, and body mass index (BMI) among 107 adults with depression. Most participants were aged 21–30 years (38.3%), male (51.4%), from rural areas (55.1%), belonged to nuclear families (81.3%), and were married (50.5%). The mean daily screen time was 397.06 ± 122.95 minutes, while the mean multiscreen addiction score was 50.00 ± 8.48. Participants had a mean physical activity level of 2671.36 ± 689.73 MET-min/week, a mean BMI of 25.89 ± 3.14 kg/m², and a mean HAM-D score of 14.78 ± 5.70, indicating predominantly mild-to-moderate depression.

Mild depression was the most common clinical presentation (50.5%), followed by moderate (27.1%), very severe (15.0%), and severe depression (7.5%). Most participants demonstrated moderate physical activity (57.0%), whereas 28.0% were overweight and 13.1% were obese. Smartphones were the predominant screen-based device used during both weekdays and weekends, with comparatively lower use of televisions, laptops, tablets, and TV-connected devices.

Correlation analysis demonstrated that depression severity was positively associated with screen time ($r=0.633$, $p<0.001$), multiscreen addiction ($r=0.911$, $p<0.001$), and BMI ($r=0.820$, $p<0.001$), while a strong negative correlation was observed with physical activity ($r=−0.677$, $p<0.001$). These findings indicate that greater depressive symptom severity is associated with increased screen exposure, problematic screen use, higher BMI, and lower levels of physical activity among adults with depression.

The participants in the present study reported a mean daily screen time of 397.06 ± 122.95 minutes (approximately 6.6 hours). Depression severity showed a significant positive correlation with screen time ($r = 0.633$, $p < 0.001$). These findings are consistent with those of Madhav et al,[15] who reported that individuals with more than six hours of daily screen exposure had significantly higher odds of moderate-to-severe depression. Similarly, Zhang et al,[16] observed that prolonged screen exposure during the COVID-19 pandemic was associated with increased depressive symptoms among college students. A recent meta-analysis by Li et al,[17] further demonstrated a dose–response relationship, indicating that the risk of depression increases progressively with longer screen exposure. Although previous studies have largely involved community or student populations, the present study extends these observations to a clinically diagnosed population with depression.

Device-specific analysis showed that smartphones constituted the primary source of screen exposure during both weekdays and weekends. This finding agrees with Yu et al,[18] who reported that smartphone use exhibited a stronger association with depressive symptoms than television viewing. Likewise, Boers et al,[19] demonstrated that increased social media use predicted subsequent depressive symptoms among adolescents, supporting the hypothesis that interactive digital media may exert greater psychological effects than passive screen activities. The predominance of smartphone use observed in the present study may therefore reflect the increasing dependence on mobile devices for communication, entertainment, and social interaction among adults.

A particularly important finding of the present study was the strong positive correlation between multiscreen addiction and depression severity ($r = 0.911$, $p < 0.001$). This observation supports previous evidence suggesting that problematic digital device use is more strongly associated with adverse mental health outcomes than screen duration alone. Saritepeci et al,[20] developed the Multiscreen Addiction Scale and demonstrated that excessive screen use, compulsive behaviour, and loss of control were strongly associated with higher addiction profiles among university students. Although some investigators have reported stronger associations between screen addiction and anxiety than depression,[21] the stronger relationship observed in the present study may be explained by the inclusion

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of clinically diagnosed patients with depression, in whom excessive digital engagement may represent a maladaptive coping strategy or behavioural manifestation of depressive illness.

Physical activity demonstrated a significant inverse association with depression severity ($r = -0.677$, $p < 0.001$). This finding is consistent with extensive evidence supporting the antidepressant effects of regular physical activity. Liang et al,[22] reported that adults meeting recommended physical activity guidelines had significantly lower odds of depressive symptoms. Similarly, Guo and Le,[23] demonstrated an inverse relationship between physical activity and depression, partly mediated through reductions in systemic inflammation. Prospective evidence from Feter et al,[24] further showed that individuals engaging in at least 150 minutes of weekly physical activity had a lower incidence of depression over time. The beneficial effects of physical activity are likely mediated through multiple biological mechanisms, including enhanced monoaminergic neurotransmission, increased neuroplasticity, reduced inflammatory activity, and improved hypothalamic-pituitary-adrenal axis regulation.[25]

Body mass index was also significantly associated with depression severity, with a strong positive correlation observed between BMI and HAM-D scores ($r = 0.820$, $p < 0.001$). Furthermore, approximately 41% of participants were either overweight or obese. These findings are in agreement with the meta-analysis by Luppino et al,[26] which demonstrated a bidirectional relationship between obesity and depression, with obesity increasing the risk of depression and depression predisposing individuals to subsequent obesity. Similar findings have been reported by Faith et al,[27] and Blaine,[28] who observed that depression contributes to future weight gain through behavioural and metabolic mechanisms. Cross-sectional studies by Nour et al,[29] and Zhao et al,[30] also identified higher BMI as an important correlate of depressive symptoms. The coexistence of overweight, obesity, and depression in the present study further supports the close interaction between metabolic health and psychiatric illness.

Collectively, the present findings support the growing evidence that unhealthy lifestyle behaviours tend to coexist rather than occur independently. Excessive screen exposure may displace opportunities for physical activity and social interaction, while physical inactivity contributes to weight gain and metabolic dysregulation. These behavioural and metabolic changes may, in turn, worsen depressive symptoms, creating a self-perpetuating cycle. Conversely, depression itself may reduce motivation for physical activity, increase sedentary behaviour, and promote excessive engagement with digital devices. This reciprocal relationship emphasizes the need to consider lifestyle behaviours as integral components of depression management rather than isolated risk factors.

Limitations: The present study has several limitations that should be considered while interpreting the findings. First, the cross-sectional design precludes establishing causal relationships between depression severity and lifestyle factors such as screen time, multiscreen addiction, physical activity, and BMI. Second, the study was conducted at a single tertiary care center using purposive sampling, which may limit the generalizability of the findings to the broader population. Third, screen time and physical activity were assessed using self-reported questionnaires, making the data susceptible to recall and reporting bias. Finally, potentially important factors such as sleep quality, dietary habits, medication adherence, and socioeconomic and psychosocial influences were not evaluated and may have influenced the observed associations.

CONCLUSION

The present study demonstrated that adults with depression exhibited substantial screen exposure, moderate levels of multiscreen addiction, and a considerable prevalence of overweight and obesity, while most participants reported moderate physical activity. Depression severity was positively associated with screen time, multiscreen addiction, and BMI, whereas physical activity showed a significant inverse relationship with depressive symptoms. These findings suggest that unhealthy lifestyle behaviours coexist with greater depression severity and may contribute to the overall burden of illness. Incorporating assessment of screen use, physical activity, and weight status into routine psychiatric evaluation may facilitate a more comprehensive approach to the management of depression.

Recommendations: Lifestyle assessment should be integrated into the routine clinical evaluation of patients with depression. Interventions promoting healthy screen-use behaviours, regular physical activity, and weight management may serve as valuable adjuncts to conventional pharmacological and psychological treatments. Future multicentre longitudinal studies with larger sample sizes are warranted to establish causal relationships and evaluate the effectiveness of lifestyle-based interventions in improving clinical outcomes among individuals with depression.

Ethics Statement: The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee of P.E.S. Institute of Medical Sciences and Research (PESIMSR), Kuppam, Andhra Pradesh, India, before commencement of the study. Written informed consent was obtained from all participants prior to enrolment. Participant confidentiality and anonymity were maintained throughout the study.

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