Prevalence of Psychiatric Morbidity and Its Association with Screen Time and Physical Activity among Adolescents in Government Schools, Tamil Nadu: A School-Based Cross-Sectional Study

DR.VAISHNAVI BHENDARKAR[1], DR. SURESH P[2] ,DR PRANEETH MANNE [3]

[1]Junior Resident, Department of Paediatrics, Shri Sathya Sai Medical College and Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Tamil Nadu, India, vbhendarkar01@gmail.com

[2]Professor and Head of the Department , Department of Paediatrics, Shri Sathya Sai Medical College and Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Tamil Nadu, India , sureshp39@ymail.com

, ORCHID ID: 0000-0001-9892-2123

[3]Junior Resident, Department of Paediatrics, Shri Sathya Sai Medical College and Research Institute, SBV Chennai Campus, Shri Sathya Sai Nagar, Ammapettai, Tamil Nadu, India , praneeth.manne2407@gmail.com

Abstract

Background:

Adolescence is a critical developmental period marked by heightened vulnerability to psychological distress. In India, the burden of adolescent psychiatric morbidity remains substantial, with growing concern regarding modifiable lifestyle behaviours such as excessive screen time and insufficient physical activity. However, evidence from school-based studies using standardised instruments remains limited, particularly in semi-urban South Indian settings.

Objectives:

To estimate the prevalence of psychiatric morbidity (screen-positive) among adolescents and to examine its association with screen time and physical activity in a school-based population.

Methods:

A school-based cross-sectional analytical study was conducted from January to June 2025 among 220 adolescents aged 10–18 years studying in government secondary and higher secondary schools in Chengalpattu district, Tamil Nadu. Psychiatric morbidity was assessed using the validated 28-item General Health Questionnaire (GHQ-28), with a cut-off score of ≥24. Screen time and physical activity were assessed using the Global School-based Student Health Survey (GSHS) sedentary behaviour question and physical activity module, respectively. Physical activity sufficiency was defined as ≥60 minutes/day. Data were analysed using descriptive statistics and chi-square tests.

Results:

The prevalence of psychiatric morbidity was 21.8% (95% CI: 16.6–27.7). Psychiatric morbidity was significantly higher among females compared to males (31.8% vs. 12.4%; $p = 0.001$). Adolescents reporting screen time >2 hours/day had a significantly higher prevalence of psychiatric morbidity than those with ≤2 hours/day (26.0% vs. 7.8%; $p = 0.010$). Similarly, psychiatric morbidity was more common among adolescents with insufficient physical activity compared to those meeting recommended levels (29.8% vs. 13.2%; $p = 0.005$). No significant associations were observed with age group, family type, or socioeconomic status.

Conclusions:

Approximately one in five adolescents experienced psychiatric morbidity, with significant associations observed for female sex, excessive screen time, and insufficient physical activity. These findings underscore the need for integrated school-based mental health screening and lifestyle-focused interventions.

Keywords: Adolescents; psychiatric morbidity; GHQ-28; screen time; physical activity; school-based study; India

How to cite this article: Bhendarkar V, Suresh P, Manne P. Prevalence of Psychiatric Morbidity and Its Association with Screen Time and Physical Activity among Adolescents in Government Schools, Tamil Nadu: A School-Based Cross-Sectional Study. Int J Drug Deliv Technol. 2026;16(47s): 1032-1039. DOI: 10.25258/ijddt.16.47s.134

Introduction

Adolescence is a critical developmental period characterised by rapid neurobiological maturation and increasing psychosocial demands. During this phase, individuals are particularly vulnerable to psychiatric morbidity, encompassing emotional, behavioural, and functional symptoms such as anxiety, depressive features, somatic complaints, and social dysfunction.(National Academies of Sciences et al., 2019) Although these manifestations may not always meet diagnostic thresholds, subthreshold psychiatric morbidity is clinically meaningful and may signal early disruptions in mental well-being with long-term implications.(Mastorci et al., 2024)

Globally, mental disorders are recognised as a major contributor to adolescent disease burden, with the

World Health Organization estimating that one in seven (15%) adolescents aged 10-19 years' experience a mental health condition that significantly affects overall wellbeing and functioning.(*Mental Health of Adolescents*) Estimates from large epidemiological syntheses indicate that hundreds of millions of children and adolescents live with diagnosable mental disorders, and these conditions account for a substantial proportion of non-fatal health loss, including years lived with disability across the 10–19-year age group. Mental disorders also contribute markedly to disability-adjusted life years, particularly through depressive and anxiety disorders becoming leading causes of adolescent disability worldwide. Although variation exists in reported global prevalence due to differences in diagnostic criteria and assessment methods, systematic analyses based on Global Burden of Disease data consistently show that mental disorders are among the top contributors to health burden in young people. The burden of these conditions is disproportionately high in low- and middle-income countries, where data coverage is limited and mental health services are underdeveloped, underscoring the need for more comprehensive epidemiological research in these settings.(Wang et al., 2025)

In India, epidemiological studies have reported variable prevalence estimates of psychiatric disorders among adolescents, reflecting differences in study settings, assessment methods, and diagnostic criteria. A meta-analysis of community and school-based studies found that prevalence ranged from approximately 6.5% in community samples to 23.3% in school settings, underscoring marked heterogeneity in observed rates of child and adolescent psychiatric disorders. (Balamurugan et al., n.d.; Malhotra & Patra, 2014) Additionally, large national surveys such as the National Mental Health Survey 2016 reported a prevalence of mental disorders of around 7.3% among adolescents aged 13–17 years, further highlighting variability in estimates across contexts and methodologies.(*Murthy RS. National Mental Healthsurvey of India 2015–2016. Indian J Psychiatry 2017;59:21-6.*, n.d.)

Concurrently, adolescents are increasingly exposed to modifiable lifestyle factors that may influence mental health, particularly rising screen-based behaviours and declining physical activity. While excessive screen time has been linked to psychological distress and regular physical activity to better mental well-being, evidence examining their co-occurrence with psychiatric morbidity remains limited in Indian adolescents assessed using standardized instruments. In this context, the present study aimed to estimate the prevalence of psychiatric morbidity, describe patterns of screen time and physical activity, and examine their distribution across sociodemographic and lifestyle characteristics.

Methods

A school-based cross-sectional analytical study was conducted to assess the prevalence of psychiatric morbidity and its association with selected lifestyle factors among adolescents. The study was carried out in government secondary and higher secondary schools located in Chengalpattu district, Tamil Nadu, India. Data collection was undertaken over a six-month period from January to June 2025 during regular school hours to ensure participation under routine academic conditions. Government schools were selected to represent adolescents from varied socioeconomic backgrounds within the district.

The sample size was calculated using the single population proportion formula: $n = Z^2 p(1-p) / d^2$, where n is the required sample size, Z is the standard normal deviate corresponding to a 95% confidence level ($Z = 1.96$), p is the anticipated prevalence of psychiatric morbidity, $q = 100 - p$, and d is the absolute precision. Based on prior Indian studies reporting prevalence of adolescent psychiatric morbidity (p) of 25% based on previous study with similar study setting.(Srinivasan et al., 2022b) The absolute precision (d) was set at 6%. Accordingly, the calculated minimum sample size was 200 adolescents. To account for potential non-response, absenteeism, and incomplete questionnaires, a 10% inflation was applied, yielding a final target sample size of 220 adolescents, which was achieved.

A multistage sampling technique was employed. In the first stage, all government secondary and higher secondary schools within the selected educational blocks of Chengalpattu district were enumerated to form the sampling frame. In the second stage, four schools were selected using simple random sampling. From each selected school, class-wise student registers were obtained, and eligible adolescents were selected using computer-generated random numbers. This approach was adopted to enhance representativeness and minimise selection bias inherent in school-based surveys.

As the study involved participants below 18 years of age, written informed consent was obtained from parents or legal guardians. Parent information sheets and consent forms were distributed to students one week prior to data collection and collected through the school after signature. On the day of survey administration, written assent was obtained from all participating adolescents after explaining the study objectives, voluntary nature of participation, confidentiality of responses, and the right to decline participation or withdraw at any time without academic consequences. Data were collected using a structured, self-administered questionnaire

administered during regular school hours in the classroom setting. The questionnaire included the General Health Questionnaire-28 (GHQ-28) and items assessing screen time and physical activity. To ensure privacy and minimise social desirability bias, students were instructed to complete the questionnaire independently. Teachers were requested to maintain a non-intrusive supervisory role and were not permitted to view or handle completed questionnaires. Seating arrangements and standardised instructions emphasised independent responses. Upon completion, questionnaires were placed by students into a closed collection box and collected by the investigators, ensuring confidentiality of individual responses.

Psychiatric morbidity screening was done using the 28-item General Health Questionnaire (GHQ-28), (Sterling, 2011) which comprises four domains: somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression, each containing seven items. Responses were scored using the Likert method (0–1–2–3), yielding a total score range of 0–84. A cut-off score of ≥24 was used to indicate the presence of psychiatric morbidity (screening). The GHQ-28 has demonstrated good reliability and validity in Indian adolescent populations. Screen time was assessed using the Global School-based Student Health Survey (GSHS) core sedentary behaviour question, which captures average daily time spent sitting and engaging in screen-based activities outside of academic work. Screen time was recorded in hours per day and categorised as ≤2 hours/day and >2 hours/day. (*Global School-Based Student Health Survey*, n.d.) Physical activity was assessed using two complementary measures. First, the GSHS physical activity item captured the number of days in the past seven days on which participants engaged in at least 60 minutes of physical activity. Second, participants reported the average daily duration (in minutes) of moderate-to-vigorous physical activity on a typical day to check if they are meeting the recommended duration of physical activity. Adolescents reporting ≥60 minutes per day were classified as sufficiently physically active, in accordance with WHO recommendations for children and adolescents. Both measures were self-reported. (*Physical Activity*, n.d.; *Questionnaire*, n.d.)

The study instruments were pilot tested among 20 adolescents from non-study schools to assess clarity, comprehension, and administration time. Minor modifications in wording and sequencing were made based on feedback. Data collection was carried out by a trained pediatric postgraduate student who underwent structured training over two days, including orientation to study objectives, detailed tool review, scoring standardisation, mock administration, and ethical conduct. Quality control measures included on-site review of completed questionnaires, weekly random audits, and supervisory oversight to minimise systematic and recording errors.

Data were entered into Microsoft Excel and analysed using SPSS version 29. Continuous variables were summarised using means with standard deviations or medians with interquartile ranges, based on normality assessed using the Shapiro–Wilk test. Categorical variables were described using frequencies and percentages. The prevalence of psychiatric morbidity was estimated with 95% confidence intervals. Bivariate associations between psychiatric morbidity and selected sociodemographic and lifestyle variables were examined using the chi-square test. Statistical significance was set at $p < 0.05$. As this was an exploratory school-based study, analyses were not adjusted for clustering; associations should therefore be interpreted cautiously. Ethical approval for the study was obtained from the Institutional Ethics Committee of the institute (Approval No: 1106/25). Participation was voluntary, confidentiality was ensured through anonymised coding, and no incentives were provided.

Results

A total of 220 adolescents were included in the analysis, with a mean age of 13.97 ± 2.74 years and representation across early, mid, and late adolescence. Males and females were almost equally represented. The study population largely comprised adolescents from nuclear families and lower to middle socioeconomic strata. The detailed sociodemographic characteristics are presented in Table 1.

Table 1. Socio-demographic characteristics of the study population (n = 220)

Variable	Category	n (%)
Age (years)	Mean ± SD	13.97 ± 2.74
Age group (years)	10–12	82 (37.3)
	13–15	64 (29.1)
	16–18	74 (33.6)
Sex	Male	113 (51.4)
	Female	107 (48.6)
Educational grade	Class 7-8	107 (48.6)
	Class 9-10	40 (18.2)
	Class 11-12	73 (33.2)
Family type	Nuclear	117 (53.2)
	Joint	103 (46.8)
Socio-economic status (Modified Kuppuswamy)	Upper	24 (10.9)
	Upper middle	26 (11.8)
	Lower middle	70 (31.8)

	Upper lower	60 (27.3)
	Lower	40 (18.2)

The distribution of GHQ-28 domain and total scores is presented in Table 2. Scores across the four domains were broadly comparable, with social dysfunction contributing the largest share to the total score. The GHQ-28 total score demonstrated a wide distribution, with both mean and median values reflecting variability in psychological symptom burden among participants.

Table 2. Distribution of GHQ-28 domain scores and total score among adolescents (n = 220)

GHQ-28 component	Possible range	Mean ± SD	Median (IQR)
Somatic symptoms	0–21	5.55 ± 3.11	5 (3–7)
Anxiety / Insomnia	0–21	5.97 ± 3.41	5 (3–8)
Social dysfunction	0–21	6.09 ± 3.14	6 (4–8)
Severe depression	0–21	5.70 ± 3.08	5 (3–7)
GHQ-28 total score	0–84	23.30 ± 10.51	20 (15–30)

Based on the predefined GHQ-28 cut-off score (≥24), 48 adolescents (21.8%) were classified as having psychiatric morbidity, while 172 (78.2%) did not meet the screening threshold. The overall prevalence and classification of psychiatric morbidity are depicted in Figure 1.

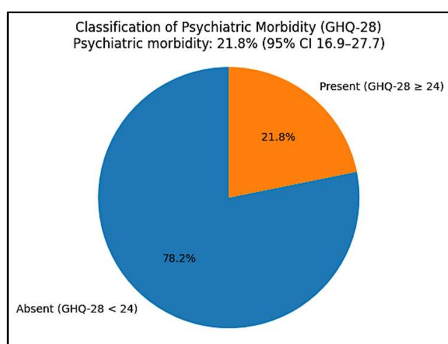

Figure 1: GHQ-28–defined psychiatric morbidity

Screen time characteristics of the study population are summarised in Table 3A. Overall, daily screen exposure was high, with most adolescents reporting screen time exceeding two hours per day. Detailed distributions of screen time measures are presented in Table 3A.

Table 3A. Screen time characteristics among adolescents (n = 220)

Variable	Category / Statistic	Value
Screen time (hours/day)	Mean ± SD	4.18 ± 2.23
	Median (IQR)	4.1 (2.2–6.1)
Screen time category	≤2 hours/day	51 (23.2%)
	>2 hours/day	169 (76.8%)

Physical activity patterns are summarised in Table 3B. Overall, adolescents reported suboptimal levels of physical activity, with participation distributed across various activity components, including school-based and leisure-time activities. Approximately half of the study population met the recommended threshold for sufficient physical activity. Detailed physical activity characteristics are presented in Table 3B.

Table 3B. Physical activity characteristics among adolescents (n = 220)

Physical activity	Statistic	Value
Days with ≥60 min physical activity (per week)	Mean ± SD	3.43 ± 2.40
	Median (IQR)	3 (1–6)
Muscle-strengthening activity (days/week)	Mean ± SD	3.51 ± 2.26
	Median (IQR)	4 (1–5)
Active transport to/from school (days/week)	Mean ± SD	3.05 ± 2.25
	Median (IQR)	3 (1–5)
Physical education classes (days/week)	Mean ± SD	2.56 ± 1.73
	Median (IQR)	3 (1–4)
Sports or games outside school (days/week)	Mean ± SD	3.08 ± 2.32
	Median (IQR)	3 (1–5)
Vigorous-intensity physical activity (days/week)	Mean ± SD	3.61 ± 2.20
	Median (IQR)	4 (2–5)
Physical activity duration (minutes/day)	Mean ± SD	52.84 ± 26.21
	Median (IQR)	45 (30–75)

Physical activity status	Sufficient (≥60 min/day)	106 (48.2%)
	Insufficient (<60 min/day)	114 (51.8%)

The distribution of psychiatric morbidity across selected sociodemographic and lifestyle variables is presented in Table 4. Psychiatric morbidity was distributed across all age groups, sexes, educational grades, family types, and socioeconomic strata. The proportion of adolescents with psychiatric morbidity was higher among females compared to males, among those reporting screen time greater than two hours per day, and among adolescents with insufficient physical activity. Psychiatric morbidity was also observed across different age groups, educational levels, family types, and socioeconomic classes. The complete bivariate distribution is shown in Table 4.

Table 4. Bivariate association between sociodemographic and lifestyle variables and psychiatric morbidity among adolescents (n = 220)

Variable	**Category**	**Psychiatric morbidity absent n (%)**	**Psychiatric morbidity present n (%)**	**χ^2**	**p-value**
Age group (years)	10–12 (n=82)	66 (80.5)	16 (19.5)	0.53	0.768
	13–15 (n=64)	50 (78.1)	14 (21.9)		
	16–18 (n=74)	56 (75.7)	18 (24.3)		
Sex	Male (n=113)	99 (87.6)	14 (12.4)	11.00	0.001
	Female (n=107)	73 (68.2)	34 (31.8)		
Educational grade	Class 7–8 (n=107)	82 (76.6)	25 (23.4)	0.85	0.654
	Class 9–10 (n=40)	30 (75)	10 (25)		
	Class 11–12 (n=73)	60 (82.2)	13 (17.8)		
Family type	Nuclear (n=117)	92 (78.6)	25 (21.4)	0.54	0.673
	Joint (n=103)	80 (77.7)	23 (22.3)		
Socio-economic status (Kuppuswamy)	Upper (n=24)	19 (79.2)	5 (20.8)	3.13	0.536
	Upper middle (n=26)	18 (69.2)	8 (30.8)		
	Lower middle (n=70)	59 (84.3)	11 (15.7)		
	Upper lower (n=60)	45 (75.0)	15 (25.0)		
	Lower (n=40)	31 (77.5)	9 (22.5)		
Screen time category	≤2 h/day (n=51)	47 (92.2)	4 (7.8)		0.010
	>2 h/day (n=169)	125 (74.0)	44 (26.0)	6.57	
Physical activity status	Sufficient (n=106)	92 (86.8)	14 (13.2)		0.005
	Insufficient (n=114)	80 (70.2)	34 (29.8)	7.94	

Discussion

The present school-based cross-sectional study estimated the prevalence of psychiatric morbidity and examined its association with selected lifestyle factors among adolescents in Chengalpattu district, Tamil Nadu. Using the validated GHQ-28, psychiatric morbidity was identified in 21.8% of adolescents, indicating a considerable burden of psychological symptoms in this population.

Psychiatric morbidity was significantly more prevalent among female adolescents, and was also significantly associated with excessive screen time (>2 hours/day) and insufficient physical activity (<60 minutes/day). Similar associations between lifestyle behaviours and adolescent mental health outcomes have been reported in Indian studies by Pahwa et al. (2019)(Pahwa et al., n.d.) and Moitra and Madan (2022),(Moitra & Madan, 2022) supporting the relevance of behavioural factors in adolescent psychological well-being.

Comparison with prevalence estimates from Indian studies

The prevalence observed in the present study aligns closely with estimates reported in other Indian school-based studies. Prevalence figures ranging from 19% to 25% have been documented among adolescents in Puducherry (Srinivasan et al., 2022),(Srinivasan et al., 2022a) Punjab (Pahwa et al., 2019),(Pahwa et al., n.d.) and Assam (Saikia et al., 2023),(Saikia et al., 2023) reinforcing the consistency of adolescent psychiatric morbidity across geographically diverse settings. Higher prevalence estimates, such as 35% reported by Jain et al., (2018)(*Jain RB, Choudhary P, Sethi S et al. Prevalence of Psychiatric Morbidities in School Going Adolescents in a Rural Block of Haryana. Epidem Int 2018; 3(4): 14-19.*, n.d.) in rural Haryana, and lower estimates such as 13.5% reported by Lamba et al. (2016)(Lamba et al., 2016) in Uttar Pradesh, highlight the influence of contextual and methodological factors, including differences in screening tools (GHQ, SDQ, DASS), urban–rural settings, and sociocultural environments. The present findings fall well within the nationally reported range, supporting the external validity of the observed prevalence.

Psychiatric morbidity was significantly higher among female adolescents in the present study, a pattern consistently reported in Indian adolescent mental health research. Studies by Pahwa et al. (2019),(Pahwa et al., n.d.) Balgir et al. (2016),(*Balgir RS, Sidhu BS, Garg M, Wats A, Sohal S. Distribution of Psychiatric Morbidity among School-Going Adolescents in a District of North India. Int J Med Res Health Sci. 2016;5(5):1–9.*, n.d.) and Saikia et al. (2023)(Saikia et al., 2023) similarly documented higher levels of emotional and psychological symptoms among female students. Prior literature suggests that this disparity may reflect interactions between biological changes during puberty and psychosocial stressors, including academic pressure, social expectations, and greater tendency toward internalising symptoms among girls. In contrast, the absence of significant associations with age group, family type, and socioeconomic status in the present study is consistent with findings by Gharat et al. (2023),(Gharat et al., 2024) who reported that adolescent mental health outcomes are often shaped more by individual and behavioural contexts than by socioeconomic gradients alone.

Excessive screen time was significantly associated with psychiatric morbidity in the present study, with adolescents reporting higher screen exposure exhibiting a greater prevalence of psychological symptoms. Similar associations have been reported in Indian studies by Moitra and Madan (2022)(Moitra & Madan, 2022) and Negi and Basavantappa (2024),(Negi & C., 2024) which demonstrated links between prolonged screen use, emotional distress, and sleep disturbance among adolescents. Evidence from international studies further supports this association, with Zhang et al. (2020)(Zhang et al., 2020) reporting increased psychological symptoms among Chinese adolescents with screen time exceeding two hours per day, and Frei et al. (2023)(Frei et al., 2023) identifying associations between excessive digital engagement and depressive and anxiety symptoms. While causal relationships cannot be inferred from cross-sectional data, these findings collectively suggest that higher screen exposure was associated with psychological distress in adolescent populations.

Insufficient physical activity was also significantly associated with psychiatric morbidity in the present study. Adolescents who did not meet the World Health Organization–recommended threshold for daily physical activity demonstrated a higher prevalence of psychological symptoms. This finding is consistent with Indian studies by Moitra et al. (2021)(Moitra & Madan, 2022) and Tundia and Thakrar (2023),(Tundia & Thakrar, 2023) which reported poorer emotional well-being among adolescents with lower physical activity levels. Studies from South Asia, including Khan et al. (2018) in Bangladesh, have further shown that low physical activity combined with high screen time is associated with greater psychosocial difficulties. Prior literature suggests that physical activity may support adolescent mental health through mechanisms related to stress regulation, sleep quality, self-esteem, and social interaction, although longitudinal studies are required to clarify these pathways.

Strengths and limitations

The strengths of this study include the use of validated, widely employed instruments to assess psychiatric morbidity, screen time, and physical activity, ensuring comparability with existing national and international literature. The school-based sampling framework and inclusion of

adolescents across early, mid, and late adolescence enhance the relevance of the findings to routine educational settings. Standardised data collection procedures, prior training of investigators, and quality-control measures further support the internal validity of the study. However, several limitations should be acknowledged. The cross-sectional design precludes causal inference between lifestyle behaviours and psychiatric morbidity. Information on screen time and physical activity was self-reported, which may be subject to recall and social desirability bias. Additionally, the study was confined to government schools in a single district, potentially limiting generalisability to private school populations or other geographic settings.

Conclusion

This school-based study demonstrates that approximately one in five adolescents in Chengalpattu district experience psychiatric morbidity, with significantly higher prevalence among female students, those reporting excessive screen time, and those with insufficient physical activity. These findings highlight the clustering of psychological symptoms with modifiable lifestyle behaviours within the school environment. Given the feasibility of school-based screening, incorporation of routine mental health screening using brief validated tools such as the GHQ-28 within existing school health programmes may facilitate early identification of adolescents at risk. Interventions focusing on reducing sedentary screen exposure, promoting regular physical activity, and gender-sensitive psychosocial support, integrated into school curricula and adolescent health services, may be particularly relevant. Future research employing longitudinal designs is warranted to elucidate temporal relationships and to evaluate the effectiveness of targeted school-based mental health and lifestyle interventions in similar settings.

References

Balamurugan, G., Sevak, S., Gurung, K., & Vijayarani, M. (n.d.). Mental Health Issues Among School Children and Adolescents in India: A Systematic Review. *Cureus*, *16*(5), e61035. https://doi.org/10.7759/cureus.61035

Balgir RS, Sidhu BS, Garg M, Wats A, Sohal S. Distribution of psychiatric morbidity among school-going adolescents in a district of North India. Int J Med Res Health Sci. 2016;5(5):1–9. (n.d.).

Frei, E., Frei, O., Jaholkowski, P., Parker, N., Parekh, P., Shadrin, A. A., Hagen, E., Bakken, N. R., Birkenæs, V., Ask, H., Andreassen, O. A., & Smeland, O. B. (2023). *The phenotypic and genetic relationship between adolescent mental health and time spent on social media, gaming, and TV*. Psychiatry and Clinical Psychology. https://doi.org/10.1101/2023.09.14.23295537

Gharat, V. V., Chandramouleeshwaran, S., Nayak, S., War, R. J., Deshpande, S. N., Nimgaonkar, V. L., Shah, H. M., Patel, R. R., Kyndiah, M. D., Shylla, W. E. D., Sunil, V., Mohanraj, S., Devi, M. D., Shukla, K., & Devi, S. (2024). Prevalence of Psychiatric Morbidity and Alcohol use Disorders Among Adolescent Indigenous Tribals from Three Indian States. *Indian Journal of Psychological Medicine*, *46*(1), 39–45. https://doi.org/10.1177/02537176231196290

Global school-based student health survey. (n.d.). Retrieved December 20, 2025, from https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-school-based-student-health-survey

Jain RB, Choudhary P, Sethi S et al. Prevalence of Psychiatric Morbidities in School Going Adolescents in a Rural Block of Haryana. Epidem Int 2018; 3(4): 14-19. (n.d.).

Lamba, R., Kumar, S., & Rana, R. (2016). A study of pattern of psychogenic morbidity and associated biosocial factors in school going adolescent girls. *International Journal of Community Medicine and Public Health*, 3493–3497. https://doi.org/10.18203/2394-6040.ijcmph20164280

Malhotra, S., & Patra, B. N. (2014). Prevalence of child and adolescent psychiatric disorders in India: A systematic review and meta-analysis. *Child and Adolescent Psychiatry and Mental Health*, *8*, 22. https://doi.org/10.1186/1753-2000-8-22

Mastorci, F., Lazzeri, M. F. L., Vassalle, C., Pingitore, A., Mastorci, F., Lazzeri, M. F. L., Vassalle, C., & Pingitore, A. (2024). The Transition from Childhood to Adolescence: Between Health and Vulnerability. *Children*, *11*(8). https://www.mdpi.com/2227-9067/11/8/989

Mental health of adolescents. (n.d.). Retrieved December 20, 2025, from https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

Moitra, P., & Madan, J. (2022). Impact of screen time during COVID-19 on eating habits, physical activity, sleep, and depression symptoms: A cross-sectional study in Indian adolescents. *PLOS ONE*, *17*(3), e0264951.

https://doi.org/10.1371/journal.pone.0264951

Murthy RS. National mental healthsurvey of India 2015–2016. Indian J Psychiatry 2017;59:21-6. (n.d.).

National Academies of Sciences, E., Division, H. and M., Education, D. of B. and S. S. and, Board on Children, Y., Applications, C. on the N. and S. S. of A. D. and I., Backes, E. P., & Bonnie, R. J. (2019). *Adolescent Development*. National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK545476/

Negi, M., & C., S. B. (2024). Effect of screen time and physical activity on sleep quality among adolescents. *International Journal Of Community Medicine And Public Health*, *11*(10), 4037–4042. https://doi.org/10.18203/2394-6040.ijcmph20242890

Pahwa, M. G., Sidhu, B. S., & Balgir, R. S. (n.d.). *A study of psychiatric morbidity among school going adolescents*. Retrieved December 22, 2025, from https://pmc.ncbi.nlm.nih.gov/articles/PMC6425794/

Physical activity. (n.d.). Retrieved December 20, 2025, from https://www.who.int/news-room/fact-sheets/detail/physical-activity

Questionnaire. (n.d.). Retrieved December 20, 2025, from https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-school-based-student-health-survey/questionnaire

Saikia, A. M., Das, H., & Rajendran, V. (2023). Mental Health Morbidities and their Correlates among the Adolescents in Kamrup (Metro), Assam: A School-Based Study. *Indian Journal of Community Medicine*, *48*(6), 835–840. https://doi.org/10.4103/ijcm.ijcm_614_21

Srinivasan, M., Premarajan, K. C., Reddy, M. M., Menon, V., & Kumar, S. G. (2022a). Prevalence of psychological morbidity and its correlates among school-going adolescents of urban Puducherry, India. *The National Medical Journal of India*, *35*, 88–92. https://doi.org/10.25259/NMJI_396_21

Srinivasan, M., Premarajan, K. C., Reddy, M. M., Menon, V., & Kumar, S. G. (2022b). *Prevalence of psychological morbidity and its correlates among school-going adolescents of urban Puducherry, India—The National Medical Journal of India*. https://doi.org/10.25259/NMJI_396_21

Sterling, M. (2011). General Health Questionnaire – 28 (GHQ-28). *Journal of Physiotherapy*, *57*(4), 259. https://doi.org/10.1016/S1836-9553(11)70060-1

Tundia, M., & Thakrar, D. (2023). Screen time, physical activity, dietary pattern and their interplay among adolescents: A survey from developing country. *Health Promotion & Physical Activity*, *22*(1), 1–7. https://doi.org/10.55225/hppa.489

Wang, Z., Dou, Y., Yang, X., Guo, X., Ma, X., Zhou, B., & Zhang, W. (2025). Global, regional, and national burden of mental disorders among adolescents and young adults, 1990–2021: A systematic analysis for the Global Burden of Disease Study 2021. *Translational Psychiatry*, *15*, 397. https://doi.org/10.1038/s41398-025-03623-w

Zhang, F., Yin, X., Bi, C., Ji, L., Wu, H., Li, Y., Sun, Y., Ren, S., Wang, G., Yang, X., Li, M., Liu, Y., & Song, G. (2020). Psychological symptoms are associated with screen and exercise time: A cross-sectional study of Chinese adolescents. *BMC Public Health*, *20*(1), 1695. https://doi.org/10.1186/s12889-020-09819-7