



ADDICTION AND ITS IMPACT AMONG ADOLESCENTS' HEALTH DURING COVID-19: A SYSTEMATIC REVIEW

Dipa Ghosh

Government School of Nursing, Ghatal, Department of Health and Family Welfare, GN-29, Swasthya Bhawan Sector-V, Salt Lake, Kolkata, West Bengal, India 700091

gdipa01@gmail.com

ABSTRACT

The COVID-19 pandemic is a considerable burden for countries which hinder to maintain high quality health services among child and adolescent. According to UNICEF 16% of the world's population is between 10 to 19 (UNICEF, 2019). The objectives of this systematic review was to examine the addiction and its impact among adolescents' health during Covid-19. PubMed and Google Scholar databases were searched from 08 September 2021 to 17 September 2021. A systematic literature search was performed in accordance with PRISMA chart and 09 literatures were selected. Out of 09 studies, 05 studies are related to internet addiction (one study for ADHD child and adolescents) and 04 studies are related to substance abuse. The reviewed literatures related to internet addiction revealed that, adolescents suffered from irregular sleep patterns, and increased the risk of 'addictive' gamers, neuroticism, impulsivity, depression, anxiety, stress, irritability, concentration problems and a deterioration of ADHD symptoms. The quality of life and social life are also influenced. The reviewed literatures related to substance use revealed that the prevalence of nicotine, smoking, alcohol drinking, cannabis and misuse of prescription drugs were higher among adolescents which leads to mental health problems during this period. These addictions have long term effect on adolescent's mental, social and physical health. So, we should take care of them and aware the adolescents and their parents regarding various impact of addiction. Government and legislative bodies must take action towards the use substances and accessibility of prescribed drugs.

Keywords: adolescent; COVID-19; internet addiction; pandemic; substance use

First Received

11 August 2021

Revised

18 September 2021

Accepted

22 November 2021

Final Proof Received

24 November 2021

Published

28 November 2021

How to cite (in APA style)

Ghosh, D. (2021). Addiction and Its Impact among Adolescents' Health during Covid-19: A Systematic Review. *Indonesian Journal of Global Health Research*, 3(4), 673-682. <https://doi.org/10.37287/ijghr.v3i4.788>.

INTRODUCTION

In December 2019, an outbreak of a novel coronavirus, known as COVID-19, occurred in China and has spread rapidly across the globe within a few months (World Health Organization, 2020). The COVID-19 pandemic is a considerable burden for countries which hinder to maintain high quality health services among child and adolescent. There is a lower risk of becoming severely ill and dying from COVID-19 among adolescents. The world constitutes by more than 2.2 billion children, which is approximately 28% of the world's population. According to UNICEF 16% of the world's population is between 10 to 19 (UNICEF, 2019). COVID-19 has a great impact among adolescents physical, social and mental health outcome. So, adolescents are a focal point of research during COVID-19. The mental health challenges among adolescents are greater among during this period of crisis, due to isolation, feelings of uncertainty, lack of daily routines, lack of access to health services provided through schools, and lack of advanced emotional development (Jones et al., 2021). Due to home confinement and sustained lockdown leads to incapable economic burden

at community level and are bearing the people to face various unwanted emotional reactions, psychological difficulties, behavioral changes including excessive substance abuse, internet addiction etc(Jana et al., 2020).

Due to this pandemic situation, schools are closed, so, students' daily activity and routine work are changed. The consequence of school closure has a negative impact among students. The cancellation of sports, activity classes and recreational facilities leads to addicted in internet, Zoom, YouTube, Instagram, and proprietary mobile applications. The studies result showed that there are several adverse effects on psychological wellbeing such as anxiety, worrying, irritability, depressive symptoms and even post-traumatic stress disorder symptoms among children due to COVID-19 pandemic situation (Cusinato et al., 2020).

The quality of the learning experience and students' mental health were affected by COVID-19 pandemic. Internet addiction (IA) among adolescents is a major public health problem around the world. Electronic devices such as television, computers, mobile phone and tablet PC become the main element for learning and social life which leads to more internet addiction among school children(Barrot et al., 2021). People engaged in substance use such as smoke, vape (e-cigarette use), use opioids, cannabis, alcohol, or psychoactive prescription drugs during this COVID-19 pandemic situation. Lockdowns and social isolation may initiate to increase the rate of substance use(Kumar et al., 2021). The objective of this study was to perform a systematic review of available published literature about addiction in terms of internet, substance use and its impact among adolescents' health during Covid-19, which help to take necessary step to improve the quality in adolescents. The objectives of this systematic review was to examine the addiction and its impact among adolescents' health during Covid-19.

METHODS

This systematic literature review was performed in accordance to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) chart. Published studies were found using a thorough search strategy of the PubMed and Google Scholar databases from 08 September 2021 to 17 September 2021. The search terms used included title of systemic review, keywords, text words, medical subject headings (MeSH) terms of the following: COVID-19, SARS-CoV-2, Adolescent, Addiction, Substance-Related Disorders, Marijuana, Heroin, Cocaine, Smoking, Cigarette Smoking. References of the articles also were reviewed and the corresponding abstracts and full articles were reviewed and accessed if relevant. All references were imported into Mendeley, where duplicates were also removed. Both the titles, abstract and full-text screening were conducted by one reviewer. The target population for this review was adolescent and age limit 10-19 years (as per WHO).

The reviewer selects only articles with English language. There were no restriction for regional literatures, the date of publication, gender, race or health condition. Reviewer excluded unpublished reports, unspecified date and location of the study, repeat data points due to updates, systematic reviews, narrative reviews, suspicion of duplicate, brief commentaries, and editorial communications from this review. The extracted information from 09 literatures are study data (author, year, geographic area, study age group, study title, type of study, number of adolescents), demographics data (including age and where available, mean age and age range), data related to addiction and its impact on health. After a primary search, total of 457 publications were reviewed. After primary review, 47 articles were removed due to duplication. The remaining 410 eligible papers were reviewed initially and then 237 irrelevant articles were excluded (PRISMA flow chart: Fig. 1) and 173 eligible

articles were selected for full text review. Ultimately, 9 articles were included in the final review. The selected studies are presented through table-1.

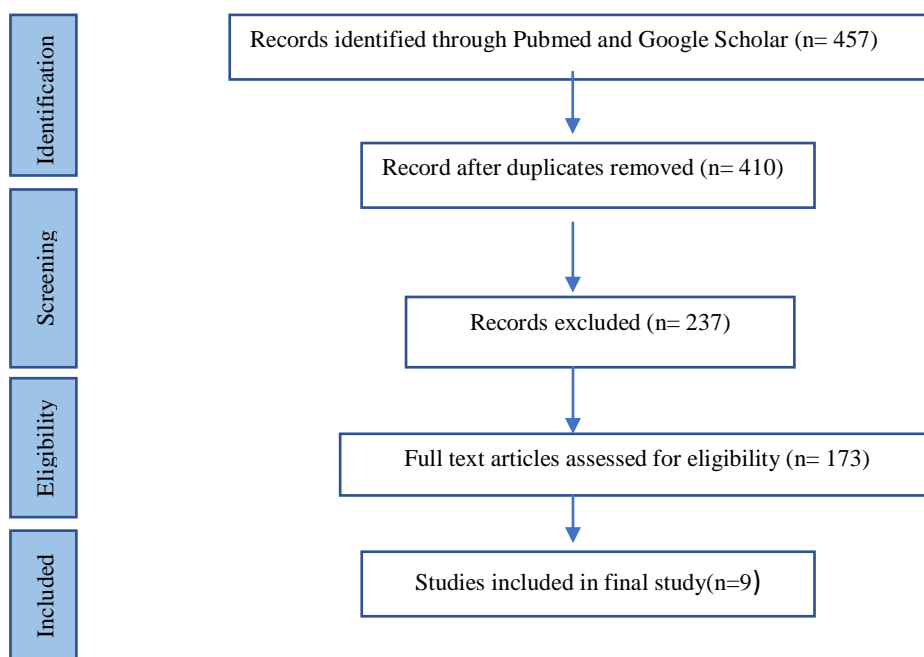


Fig. 1 Search Strategy using PRISMA flowchart

Table 1. Articles Included in Systematic Review

Author	Year	Country	Study Title	Type of Study	No of adolescent	Type of Addiction	Mean Age (years)	Age ranges (Years)
(ÖZAY KAN et al., n.d.)	2020	Turkey	Internet addiction and quality of life of adolescents who apply to family medicine outpatient clinics during the COVID-19 Pandemic Process.	cross-sectional	126	Internet	13.2	10-19
(Kim & Lee, 2021)	2020	South Korea	Addictive internet gaming usage among Korean adolescents before and after the outbreak of the COVID-19 Pandemic.	longitudinal	2906	Internet Gaming	13.62	Elementary students (four to six) middle school students (seven)
(Lin, 2020)	2020	Taiwan	Prevalence of internet addiction during the COVID-19 outbreak and Its risk factors among Junior High School Students in Taiwan.	cross-sectional	1060	Internet Addiction	-	Junior high school students
(Fazeli et al., 2020)	2020	Iran	Depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak	cross-sectional	1512	Internet gaming	15.51	13-18
(Werling et al., 2021)	2020	Switzerland	Impact of the COVID-19 lockdown on screen media use in patients referred for ADHD to child and adolescent psychiatry: an introduction to problematic use of the internet in ADHD and results of a survey.	longitudinal	126	Screen media	-	10-18
(Thorisdottir et	2020	Iceland	Depressive symptoms, mental wellbeing, and substance use	longitudinal	17475	Substance use	-	13-18

al., n.d.)			among adolescents before and during the COVID-19 pandemic in Iceland: a longitudinal, population-based study.					
(Leatherdale et al., 2021)	2020	Canada	Examining the impact of the early stages of the COVID-19 pandemic period on youth cannabis use: adjusted annual changes between the pre-COVID and initial COVID-lockdown waves of the COMPASS study.	cross-sectional	1937	Cannabis	-	grades 9 through 12
(Gilic et al., 2021)	2020	Bosnia and Herzegovina	Evidencing the influence of pre-pandemic sports participation and substance misuse on physical activity during the COVID-19 lockdown: A Prospective Analysis among Older Adolescents.	Prospective Analysis	661	Substance Misuse	-	15-18
(Pelham et al., 2021)	2020	United States	Early adolescent substance use before and during the COVID-19 Pandemic: A Longitudinal survey in the ABCD study cohort William	Longitudinal	7,842	Substance Use	12.4	10.5-14.6

RESULTS

Demographics data

09 studies were selected for this systematic review. The total sample size was 33,645 adolescents (Table 1). Age range of this study is 10-18 years adolescents. Age range was mentioned in six studies, grades was mentioned in two studies and junior high school students was mentioned in one study. The mean age of adolescents in four studies are 13.2, 13.62, 15.51 and 12.4 years.

Summary of selected studies

A cross-sectional study was conducted on internet addiction and quality of life among 126 adolescents, 10 to 19 years old, who admitted to İstanbul Umraniye Training and Research Hospital Family Medicine Outpatient unit during the COVID-19 Pandemic situation between July 10 and September 10, 2020 (ÖZAYKAN et al., n.d.). Socio demographic questionnaire, young internet addiction scale (YIAT-SF), World Health Organization Quality of Life Short form, Turkish Version (WHOQOL-BREF-TR) were used to assess the level of internet addiction and quality of life. 87% of the adolescents had internet connection at their home. The study result revealed that, due to internet addiction irregular sleep patterns and hours of sleep during daylight have increased in adolescents (97%). 83% adolescents gained weight due to irregular sleep. The quality of life decreased the most in social domain but the quality of life scores was higher for females compared to males (P=0.049). The present study revealed that an increase in internet addiction and a decrease in the quality of life in adolescents during the Covid-19 Pandemic.

A comparative longitudinal study was conducted on addictive internet gaming usage and time spent playing games on the internet among Korean adolescents before and after the outbreak of the COVID-19 Pandemic in 2018 and 2020 (Kim & Lee, 2021). Seven factors of a maladaptive gaming usage scale and a four-profile model were used for data analysis. The two-way ANCOVA result showed that, there was a significant interaction between the cohorts group, 2018 cohort vs. 2020 cohort, (F = 44.059, p < 0.001). The study result showed that adolescents spent the longest play time on both a PC (173 min) and mobile phones (183 min).

The study result also revealed that, the mean difference in addictive internet gaming usage among Korean adolescents was 1.2% to 4.9% between the year 2018 and 2020. As per this study, male respondents of the 2020 cohort were at greater risk of being classified as 'addictive' gamers due to COVID-19.

A cross-sectional study was conducted on prevalence of internet addiction during the COVID-19 outbreak and its risk factors among 1060, Junior High School Students in Taiwan (Lin, 2020). Data were collected by stratified and cluster sampling methods. The study result revealed that, prevalence of internet addiction among junior high school students was 24.4% (95% confidence interval, 21.8–27.0). As per Logistic regression analyses, internet addiction leads to increase the risk of high impulsivity, high virtual social support, low subjective well-being, low family function, and high alexithymia. The mean percentages of neuroticism (18.83), impulsivity (33.61), depression (6.41) and alexithymia (59.88) are higher in internet addiction group.

A cross-sectional study was conducted to evaluate the depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak among 1512 Iranian adolescents (Fazeli et al., 2020). Internet Gaming Disorder (IGD) Scale-Short Form, Depression, Anxiety, and Stress Scale-21, Insomnia Severity Index and Pediatric Quality of Life Inventory™ 4.0 Short Form were utilized for data collection. The mean IGD score was 19.07 (SD = 7.31), psychological distress scores was 7.24 for depression (SD = 4.93), 8.46 for anxiety (SD = 5.64), and 6.87 for stress (SD = 5.11). The quality of life score among adolescents were 74.38 (SD = 19.30). The insomnia severity score was 9.94 (SD = 5.59). The study result showed that, there was interrelationships between insomnia, depression, anxiety, stress, IGD, and quality of life with internet gaming. The study result showed that, all the correlations among variables were significant and they are in the anticipated direction ($p < 0.05$, absolute r range 0.19–0.71) and Internet gaming disorder had direct influence in insomnia and quality of life among the participants.

A longitudinal study was conducted on impact of the COVID-19 lockdown on screen media use in patients referred for ADHD to child and adolescent psychiatry and psychotherapy (CAPP), University of Zurich, Switzerland (Werling et al., 2021). Online survey was conducted for three times and observed the behavior before, during and 1–2 months after the lockdown. The study result revealed that, the use of smartphone was increased over 4 h per day from 15% (before the Corona crisis) to 36% (under lockdown), tablet/PC use from 2 to 22% and gaming console use from 3 to 11%. A small group (4%) began to watch TV for more than 4 h per day. It was observed that girls used high social media time (over 4 h: 28%, $N = 9$) but low gaming time (over 4 h: 3%, $N = 1$; no gaming: 53%, $N = 17$) under lockdown. Screen media had a negative impact on everyday life which was significantly increased under lockdown period. Use of media time under lockdown was elevated with high irritability, concentration problems and a deterioration of ADHD symptoms. As per this study, due to lockdown, the duration of media use increased by 46% but spending time for the media use did not completely return to pre-Corona levels afterwards.

A longitudinal, population-based study was conducted to evaluate the depressive symptoms, mental wellbeing and substance use among 13-18 years adolescents before and during the COVID-19 pandemic in Iceland (Thorisdottir et al., n.d.). Surveys were done in 2016 (21404), 2018(20822), and 2020 (during the COVID-19 pandemic). Depressive symptoms, mental wellbeing, and the frequency of cigarette smoking, e-cigarette use, and alcohol intoxication

were assessed by surveys. In this study, it was observed that the depressive symptoms (β 0.57, 95% CI 0.53 to 0.60) increased and mental wellbeing (β -0.46, 95% CI -0.49 to -0.42) worsened during the pandemic compared with same-aged group before COVID-19 and outcomes of substance use was significantly worsen in adolescent girls compared to boys (β 4.16, 95% CI 4.05 to 4.28, and β -1.13, 95% CI -1.23 to -1.03, respectively). The study result reported that, the rate of cigarette smoking (OR 2.61, 95% CI 2.59 to 2.66), e-cigarette use (OR 2.61, 95% CI 2.59 to 2.64), and alcohol intoxication (OR 2.59, 95% CI 2.56 to 2.64) decreased among 15–18-year-olds during COVID-19. The study result also suggested that COVID-19 influenced and impaired adolescent mental health but the number of substance use decreased during the pandemic period.

A cross-sectional study was conducted on examining the impact of the early stages of the COVID-19 pandemic period on youth cannabis use (Leatherdale et al., 2021). Three surveys were done in 2018 and 2019 (pre-COVID-19) and 2020 (online survey during the early pandemic). The study reported that, the use of cannabis among respondents was 11.7% ($n = 882$) in 2020. The study result presented that, 27.3% ($n = 241$) of respondents reported that their cannabis use increased because of COVID-19, whereas 23.2% ($n = 205$) of respondents reported that their cannabis use decreased because of COVID-19 and 27.4% ($n = 242$) of respondents reported that they were using cannabis to cope with changes related to COVID-19. past year.

A Prospective analysis was conducted to evaluate the influence of before pandemic sports participation and substance misuse on physical activity among 661 high-school students from Bosnia and Herzegovina during the COVID-19 lockdown (Gilic et al., 2021). Data were collected, two times, before the COVID-19 pandemic and during the COVID-19 lockdown. The Physical Activity Questionnaire for Adolescents (PAQ-A) was used for the assessment of physical activity level (PAL) and Substance use and misuse were assessed by questioning regarding cigarette smoking, alcohol consumption, and drug consumption. The study result revealed that, the adolescents with an insufficient PAL during the COVID-19 lockdown had higher smoking rate (MWZ: 1.56, $p = 0.04$). The number of harmful alcohol drinking and illicit drugs were more in the adolescents with an insufficient PAL during the COVID-19 lockdown. This study concluded that, sports are important in many challenging situations, such as the COVID-19 lockdown.

A Longitudinal Survey was conducted on early adolescent substance use before and during the COVID-19 pandemic across the U.S. (Pelham et al., 2021) Three-wave assessment of substance use were completed in May, June and August 2020. At each survey, youth reported regarding the use of alcohol, nicotine, cannabis, or other substances in the past 30 days. Collected data were linked to prepandemic surveys that the same youth had completed the survey in 2018, 2019 and January 2020. The study result revealed that 8.0% of youth ever reported use of any substance, 3.4% ever reported use of alcohol, and 3.6% ever reported use of nicotine. The pretest/posttest design showed that the change in rates of substance use from before the pandemic to the first survey during the pandemic. The prevalence of alcohol use decreased from 1.9% to 0.7% ($p = .03$). The prevalence increased for use of nicotine (0% to 1.5%; $p = .005$) and misuse of prescription drugs (0% to 0.7%; $p = .05$). The study reported that, stress, anxiety, and depressive symptoms during the pandemic were positively associated with the use of substance use ($p < .001$). The study result identified that, alcohol consumption decreased and nicotine and misuse of prescription drugs consumption increased.

DISCUSSION

In this systematic review, there were conclusive evidence of addiction and its impact on adolescent health due to the potential negative impact of COVID-19 pandemic. Pandemic has adverse effect on adolescents physical and mental health due to the social isolation, school closure, fall down of family income. Adolescents may be more vulnerable to develop behavioral addictions and substance abuse due to the impacts of COVID-19 pandemic. In this literature review, 09 articles were taken for review according to PRISMA flowchart from nine country(Turkey, South Korea, Taiwan, Iran, Switzerland, Iceland, Canada, Bosnia and Herzegovina and United States). All studies are conducted in 2020. Out of 09 studies, 04 studies are cross-sectional, 04 studies are longitudinal and 01 study is prospective analysis. Out of 09 studies, 05 studies are related to internet addiction (one study for ADHD child and adolescents) and 04 studies are related to substance abuse.

From above literature review, all the studies on internet addiction during the COVID-19 outbreak suggested that the level of internet addiction, internet gaming and smartphone uses are increased among adolescents. The above studies result revealed that, impact of internet addiction are irregular sleep patterns , day time sleep , and increased the risk of ‘addictive’ gamers, neuroticism, impulsivity, depression, anxiety, and stress among adolescents. The quality of life and social life are also influenced by internet addiction. But, the quality of life scores was higher for females compared to males. High irritability, concentration problems and a deterioration of ADHD symptoms are also found due to elevated media time under lockdown.

During the pandemic, adolescents are more prone to use substances like cigarette, alcohol, cannabis, drugs because, they were more stressed by pandemic-related uncertainty. 27.3% of respondents reported increased cannabis use , 23.2% reported decreased cannabis use. Similarly, 27.4% (n = 242) of respondents reported that cannabis helps to cope with COVID-19. Prevalence of nicotine, smoking, alcohol drinking and misuse of prescription drugs were higher among adolescents. Adolescents mental, social and physical health and sports participation are significantly impaired which leads to stress, anxiety, and depressive symptoms. Only one reviewer reviewed all the articles, the reviewed literature is only 09. The quality of literatures, statistical calculation and publication bias were not measured.

CONCLUSIONS

So, addiction in terms of internet and substance use during COVID-19 could become a major public health threat among adolescents. The use of digital entertainment, internet addiction and substance use could emerge as an important issue for adolescents. Maintain social isolation, social distancing, staying at home and online learning helped to increase the internet addiction and substance use. Addictions have several adverse effects on psychological wellbeing such as anxiety, worrying, irritability, depressive symptoms, social life and quality of life. These addictions have long term effect on adolescent’s health. So, as a nurse, we should take care of the them and aware the adolescents and their parents regarding various impact of addiction. Parents need to pay special attention to how much time and how frequently their children use internet, spent time with them, and engage in physical exercise, creative works. Government and legislative bodies must take action towards upholding the social security of substance use and accessibility of prescribed drugs.

REFERENCES

Barrot, J. S., Llenares, I. I., & Leo, S. (2021). Students ’ online learning challenges during the pandemic and how they cope with them : The case of the Philippines. *Education and*

Information Technologies, 0123456789. <https://doi.org/10.1007/s10639-021-10589-x>

- Cusinato, M., Iannattone, S., Spoto, A., Poli, M., Moretti, C., Gatta, M., & Miscioscia, M. (2020). Stress, resilience, and well-being in Italian children and their parents during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 17(22), 1–17. <https://doi.org/10.3390/ijerph17228297>
- Fazeli, S., Mohammadi Zeidi, I., Lin, C. Y., Namdar, P., Griffiths, M. D., Ahorsu, D. K., & Pakpour, A. H. (2020). Depression, anxiety, and stress mediate the associations between internet gaming disorder, insomnia, and quality of life during the COVID-19 outbreak. *Addictive Behaviors Reports*, 12. <https://doi.org/10.1016/J.ABREP.2020.100307>
- Gilic, B., Zenic, N., Separovic, V., Savicevic, A. J., & Sekulic, D. (2021). Evidencing the influence of pre-pandemic sports participation and substance misuse on physical activity during the COVID-19 lockdown: A prospective analysis among older adolescents. *International Journal of Occupational Medicine and Environmental Health*, 34(2), 151–163. <https://doi.org/10.13075/IJOMEH.1896.01733>
- Jana, M., Ghosh, R., Chatterjee, S., & Biswas, P. (2020). *Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website. Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active. Diabetes & Metabolic Syndrome: Clinical Research & Reviews COVID-19 and addiction. January.*
- Jones, E. A. K., Mitra, A. K., & Bhuiyan, A. R. (2021). Impact of covid-19 on mental health in adolescents: A systematic review. *International Journal of Environmental Research and Public Health*, 18(5), 1–9. <https://doi.org/10.3390/ijerph18052470>
- Kim, D., & Lee, J. (2021). Addictive internet gaming usage among korean adolescents before and after the outbreak of the covid-19 pandemic: A comparison of the latent profiles in 2018 and 2020. *International Journal of Environmental Research and Public Health*, 18(14). <https://doi.org/10.3390/IJERPH18147275>
- Kumar, N., Janmohamed, K., Nyhan, K., Martins, S. S., Cerda, M., Hasin, D., Scott, J., Pates, R., Ghandour, L., Wazaify, M., & Khoshnood, K. (2021). *Substance use and substance use disorder, in relation to COVID-19: protocol for a scoping review.* 1–6.
- Leatherdale, S. T., Bélanger, R. E., Gansaonré, R. J., Patte, K. A., deGroh, M., Jiang, Y., & Haddad, S. (2021). Examining the impact of the early stages of the COVID-19 pandemic period on youth cannabis use: adjusted annual changes between the pre-COVID and initial COVID-lockdown waves of the COMPASS study. *BMC Public Health*, 21(1). <https://doi.org/10.1186/S12889-021-11241-6>
- Lin, M. P. (2020). Prevalence of internet addiction during the covid-19 outbreak and its risk factors among junior high school students in Taiwan. *International Journal of Environmental Research and Public Health*, 17(22), 1–12.

<https://doi.org/10.3390/IJERPH17228547>

- ÖZAYKAN, E., Emin, P., & Science, S. E.-B. S. J. of H. (n.d.). Internet Addiction and Quality of Life of Adolescents Who Apply to Family Medicine Outpatient Clinics During the COVID-19 Pandemic Process. *Dergipark.Org.Tr.* <https://doi.org/10.19127/bshealthscience.897980>
- Pelham, W. E., Tapert, S. F., Gonzalez, M. R., McCabe, C. J., Lisdahl, K. M., Alzueta, E., Baker, F. C., Breslin, F. J., Dick, A. S., Dowling, G. J., Guillaume, M., Hoffman, E. A., Marshall, A. T., McCandliss, B. D., Sheth, C. S., Sowell, E. R., Thompson, W. K., Van Rinsveld, A. M., Wade, N. E., & Brown, S. A. (2021). Early Adolescent Substance Use Before and During the COVID-19 Pandemic: A Longitudinal Survey in the ABCD Study Cohort. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 69(3), 390–397. <http://www.ncbi.nlm.nih.gov/pubmed/34452728>
- Thorisdottir, I. E., Asgeirsdottir, B. B., Kristjansson, A. L., Valdimarsdottir, H. B., Maria, E., Tolgyes, J., Sigfusson, J., Allegrante, J. P., Sigfusdottir, I. D., & Halldorsdottir, T. (n.d.). Articles Depressive symptoms , mental wellbeing , and substance use among adolescents before and during the COVID-19 pandemic in Iceland : a longitudinal , population-based study. *The Lancet Psychiatry*, 8(8), 663–672. [https://doi.org/10.1016/S2215-0366\(21\)00156-5](https://doi.org/10.1016/S2215-0366(21)00156-5)
- Werling, A. M., Walitza, S., & Drechsler, R. (2021). Impact of the COVID-19 lockdown on screen media use in patients referred for ADHD to child and adolescent psychiatry: an introduction to problematic use of the internet in ADHD and results of a survey. *Journal of Neural Transmission*, 128(7), 1033–1043. <https://doi.org/10.1007/S00702-021-02332-0>

