

Loneliness, affective disorders, suicidal ideation, and the use of psychoactive substances in a sample of adolescents during the COVID-19 pandemic: A cross-sectional study

Loredana Cena | Alice Trainini | Sara Zecca | Sofia Bonetti Zappa |
Federica Cunegatti | Chiara Buizza

Department of Clinical and Experimental Sciences (DSCS), Section of Neuroscience, University of Brescia, Brescia, Italy

Correspondence

Loredana Cena, Observatory of Perinatal Clinical Psychology, Department of Clinical and Experimental Sciences, Section of Neuroscience, University of Brescia, viale Europa 11, Brescia 25123, Italy.
Email: loredana.cena@unibs.it

Funding information

Department of Clinical and Experimental Sciences, University of Brescia (Italy)

Abstract

Problem: The global coronavirus (COVID-19) pandemic has been challenging for adolescents. Indeed, with the closure of schools and social centers and reduction of extracurricular activities, increased social isolation has compounded difficulties in and with school performance, loneliness, and social networking. Increased risk of mental health problems, substance abuse, affective disorders, suicidal ideation, and suicide has been reported in adolescents.

Methods: This cross-sectional study assesses the association between loneliness, depression, anxiety, suicidal ideation, the use of social networks, and school achievement in a sample of Italian adolescents during the COVID-19 pandemic. This study also explores emotional dysregulation through the association between affective disorders (depression and anxiety), substance use, and social networks. The sample comprises adolescents in the first and second grades of high school during the pandemic; participants received an email explaining the purpose of the e-research. Data were collected using the Strengths and Difficulties Questionnaire, the Achenbach System of Empirically Based Assessment, and the Loneliness Scale.

Findings: A total of 505 adolescents completed the web survey. Data revealed that students experienced difficulties with loneliness, problems with school achievement, and extracurricular activities. The mean scores for depression and anxiety were close to the borderline range. A total of 14.3% of adolescents intentionally harmed themselves or attempted suicide.

Conclusions: This study raises concerns about the impacts of the pandemic on adolescents that require the attention of adult reference figures who deal with adolescents, such as parents, teachers, and healthcare professionals. Results indicate the necessity of providing early interventions aimed at the prevention of psychopathologies and the promotion of adolescent mental health due to the pandemic.

KEYWORDS

adolescents, affective disorders, suicidal ideation

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1 | INTRODUCTION

Adolescence is a period of life characterized by complex physical, psychological, and social changes influenced by the family, school, and wider community environment (WHO, 2021), and can significantly impact health. The global COVID-19 pandemic has been challenging for adolescents (Fegert et al., 2020) resulting in an increased risk of mental health problems (Li et al., 2021; Magson et al., 2021), substance abuse (Hawke et al., 2020), irritability (Jefsen et al., 2020; Loades et al., 2020; Raballo et al., 2021), hyperactivity (Babore et al., 2022), stress and fear (R. Liu, Chen, et al., 2022), obsessive-compulsive problems (Conti et al., 2020), depression (Z. H. Wang et al., 2020), and anxiety (E. A. K. Jones et al., 2021; Smirni et al., 2020), especially among those who regularly engaged in activity (Chen et al., 2020). Indeed, international studies have reported that some 20.1% and 25.1% of adolescents suffer depression and anxiety, respectively (Huang & Zhao, 2020). Studies have shown that a difficult relationship with family members is associated with greater vulnerability to affective disorders (Temple et al., 2022), and that adolescents from disrupted families experience a higher level of depressive symptoms (Hou et al., 2021). Spending more time with family members is negatively associated with depression (Ellis et al., 2020), although it can exacerbate conflicts between relatives (Li et al., 2021). While some adolescents enjoy quality family time when staying at home, others find it a place of conflict rather than comfort (J. Wang et al., 2021). Also, the children of socioeconomically disadvantaged families that live in conditions of deprivation may be more vulnerable to depressive symptoms (M. Serra et al., 2022).

Meanwhile, several Italian studies have reported an increase in depressive and anxiety symptoms among Italian adolescents during the first lockdown, as well as in those without a pre-existing diagnosis of a depressive disorder (Amendola, 2022). In this respect, Pisano et al. (2021) reported that 47.5% and 14.1% of Italian adolescents experienced anxiety and depression, respectively (Pisano et al., 2021).

In a systematic review, Panda et al. (2021) observed increases in anger, sleep disturbances, and posttraumatic stress disorder in adolescents, while S. E. Jones et al. (2022) found that almost 20% of younger individuals seriously considered suicide and 9% attempted suicide during the pandemic. A significant increase in non-accidental injuries has also been reported (Collings et al., 2022).

The experience of loneliness is common in preadolescence and adolescence (Corsano, 2018). However, during the COVID-19 pandemic, social distancing and isolation due to pandemic-related restrictions—including the closure of schools and social centers and restriction of extracurricular activities—exacerbated the conditions that result in loneliness (Zhen et al., 2021), facilitating increases in anxiety (Johnson et al., 2001; Muzi et al., 2022) and depressive symptomatology (Christiansen et al., 2021; Kayaoğlu & Başçılilar, 2022). Persistent feelings of loneliness, boredom, sadness, and hopelessness were less prevalent among young people who felt virtually connected with others during the pandemic (S. E. Jones et al., 2022). Adolescents who feel lonely are more likely to use negative strategies to cope with stress, such as withdrawing socially,

isolating themselves, and not asking for help (J. Wang et al., 2021). Loneliness is also associated with low school achievement (Muzi et al., 2022).

A systematic review reported that the negative experiences of social distancing were alleviated by spending more time on digital devices (Marciano et al., 2022), increasing the risk of social media (Cauberghe et al., 2021), Internet (Lin, 2020), and smartphone (G. Serra et al., 2021) addiction. Scholars also observed an increase in the oversharing of private content (Caffo et al., 2020), cyberbullying (Imran et al., 2020), gaming and gambling (Cena, Rota, Calza, et al., 2022), engaging with potentially harmful content (Manivannan et al., 2021), physical stress (Guo et al., 2021), depression, and insomnia (S. Liu, Zou, et al., 2022). However, as international studies have shown (Cauberghe et al., 2021; Moore et al., 2020), use of social media networks could also have positive features insofar as it enables adolescents to stay connected with friends and peers. In the Italian context, research indicates a general increase in the use of new technologies not necessarily linked to distance learning (OPL Ordine degli Psicologi della Lombardia, 2022).

During the pandemic, the increased consumption of alcohol and psychoactive substances (S. E. Jones et al., 2022) raised potential risk factors for health (Becker & Gregory, 2020; Raballo et al., 2021) and psychopathologies (Jefsen et al., 2020; E. A. K. Jones et al., 2021; Raballo et al., 2021). According to Chaiton et al. (2022), the largest increases were observed in the consumption of alcohol (+19%), cigarettes (+16%), e-cigarettes (+37%), and cannabis (+47%). In regard to the prevalence of psychoactive substance consumption among youths during Italy's lockdown period, an estimated 43.1% of students drank alcohol, 4.2% became intoxicated, and 16% engaged in binge drinking characterized by having five or more drinks in a row; 18.4% reported smoked at least one cigarette; 5.9% used cannabis; and 0.9% reported using at least one illegal substance (Biagioni et al., 2022).

Studies have shown that a difficult relationship with family members (Temple et al., 2022), a poor relationship with parents and a lack of parental monitoring and family support (Ali et al., 2022) are predictors of an increased use of illicit substances (alcohol, cigarettes, and drugs) among youths.

Adolescents also reported more difficulties regulating emotion during the COVID-19 pandemic than the prepandemic period (Hen et al., 2022). In this respect, the higher consumption of psychoactive substances can be considered a means of coping with the psychological distress, anxiety, and depression associated with the lockdown (Essau & de la Torre-Luque, 2021; Romano et al., 2021). These at-risk behaviors appear to be associated with low family support (Shapiro et al., 2022) and poor parent-child relationships (Kapetanovic et al., 2022).

In light of the foregoing, this study assesses the association between loneliness, depression, anxiety, suicidal ideation, the use of social networks, and school achievement in a sample of Italian adolescents during the COVID-19 pandemic. This study also explores emotional dysregulation in terms of the association between affective disorders (depression and anxiety), substance use, and social networks.

2 | METHODS

This work is part of a larger study (Cena, Rota, Trainini, et al., 2022), conducted from March 2020 to March 2021 by the University of Brescia in collaboration with the Ufficio scolastico regionale per la Lombardia Ufficio IV Ambito Territoriale di Brescia (Regional School Office for Lombardy, IV District of Brescia) and the Osservatorio Provinciale del contrasto alle ludopatie e al gioco d'azzardo di Brescia (Provincial Observatory for the Prevention of Compulsive Gambling Disorders and Betting of the Lombardy region).

2.1 | Study design and participants

This cross-sectional, descriptive, correlational study uses a sample comprising 795 adolescents (aged 13–18 years) in the first or second grade of high school in Northern Italy. Participation was based on the following inclusion criteria: (a) participants were in the first or second grade of high school, and (b) had the cognitive competence to express themselves. Potential participants were excluded if they were not sufficiently proficient in Italian to complete the questionnaires. All participants were informed that the survey was completely anonymous and that participation was voluntary. Potential participants received an email with a detailed description of the study and a request to complete web-based questionnaires (Pealer & Weiler, 2003) using an online survey tool (www.limesurvey.org). Participants were provided all necessary information and agreed to participate in the study by completing a form establishing informed consent. Although all participants were asked to provide consent, written consent was obtained from adolescents of legal age and from parents on behalf of their children if participants were under the age of 18.

2.2 | Measures

2.2.1 | Sociodemographic assessment form

Participants were required to complete a sociodemographic assessment form, which provided information regarding their sex, age, nationality, place of residence and its characteristics, presence of recreational places near home, family composition, parent education level, and admired adult figures. The form also obtained information regarding participants' use of social networks via three items.

2.2.2 | The Strengths and Difficulties Questionnaire (SDQ)

The SDQ is a short emotional and behavioral screening questionnaire for youths (Goodman, 1997) comprising 25 positive or negative attributes, each of which are rated on a 3-point Likert scale ranging from 0 (*never*) to 2 (*certainly true*). Items are divided into five subscales: conduct problems, emotional symptoms, hyperactivity/

inattention, peer relationship problems, and prosocial behavior, each of which with a range score from 0 to 10. The total difficulty score is obtained from the sum of the first four scales, with a range score from 0 to 20. A higher score corresponds to a higher degree of difficulty, except in the case of the prosocial behavior scale (Tobia et al., 2011). The Italian version of the SDQ has good internal coherence for all scales, with Cronbach's α values between 0.70 and 0.88 (Tobia et al., 2011). In this study Cronbach's α values ranged between 0.66 to 0.82.

2.2.3 | The Achenbach System of Empirically Based Assessment (ASEBA)

The ASEBA questionnaires assess adaptive and maladaptive behaviors and overall functioning of individuals (Achenbach, 2001; Frigerio et al., 2004). The system includes report forms for multiple informants; this study used the Youth Self Report Form (YSR) (11–18 years), with which adolescents rate their own behavior.

The ASEBA questionnaire comprises 136 items on a range from 0 to 2 that are included in the following scales: DSM-oriented scales (Depressive Problems; Anxiety Problems; Somatic Problems; Attention Deficit/Hyperactivity Problems; Oppositional Defiant Problems; Conduct Problems) with a score ranging from 50 to 100; competence scale, that assesses activities (e.g., sports activities, etc.), sociality (e.g., participation in organizations, clubs, friendly relationships, etc.), total competence (e.g., scholastic performance), and academic scale with a score ranging from 20 to 65; syndrome scales that include internalizing, and externalizing problems, anxious/depressed, withdrawn/depressed, somatic complaints, social, thought and attention problems, rule-breaking and aggressive behavior, other problems with a score ranging from 50 to 100. The results were interpreted as meeting one of three intervals. For the DSM-Oriented and syndromic scales are normal < 60, borderline = 60–63, clinical > 63; for the competence scale are normal > 40, borderline = 37–40, < 37 clinical.

The Italian version of ASEBA proved to be a reliable instrument, with Cronbach's α values ranging between 0.71 and 0.95 (Pace & Muzi, 2019). Also in this study Cronbach's α values were good ranging from 0.69 to 0.95.

2.2.4 | The Loneliness Scale (LS)

The LS is a six-item scale with response options rated on a scale ranging from 0 to 2 (De Jong Gierveld & Van Tilburg, 2006). The total score comprises ranges from 0 (no loneliness) to 6 (extreme loneliness). In addition to the total score, LS provides two subscales each consisting of three items: emotional loneliness (e.g., feeling of missing an intimate relationship); social loneliness (e.g., missing a wider social network). The Italian version of the LS proved to be a reliable instrument, with a Cronbach's α ranging between 0.78 (Musetti et al., 2020) and 0.92 (Primi et al., 2021). In this study Cronbach's α values ranged between 0.66 to 0.82.

2.3 | Data analysis

This study provides descriptive statistics for sociodemographic characteristics in terms of the mean and standard deviation for continuous variables, and reports frequencies and percentages for categorical variables. This study performed χ^2 , *t* test, or the corresponding nonparametric Mann–Whitney test (for non-Gaussian distributed variables) and one-way ANOVA, applying a Bonferroni correction, to examine differences among groups defined by sociodemographic variables, use of substances, use of social networks, and attempted suicide. In order to examine the association between variables, this study conducted bivariate correlation using Pearson's correlation coefficient. All tests were two-tailed, and the probability of type I error was set at $p < 0.05$. All analyses were performed using SPSS 28.

3 | FINDINGS

3.1 | Demographic, social, and environmental information

A total of 795 adolescents were informed and asked to participate in this study; 529 (66.54%) agreed to participate in the web-based survey. The final sample comprised 505 adolescents (343 females, 161 males, and 1 "other") who provided valid and complete questionnaires and were included in the analysis. The mean age of the sample was 16.0 (SD = 1.9); 68% of participants were female, while the remaining 32% were male. In terms of school level, 21.2% were enrolled in the first grade and 68.2% in the second grade of high school; 14.3% of participants had failed school at least once. Almost all participants (93.1%) were born in Italy, and lived with both parents (85.5%). The majority of fathers (34.5%) had a secondary school of first-grade degree, while most mothers (36.4%) had graduated secondary school in the second grade. In respect to parental employment, 95% of participants reported that both parents were employed. The surveyed adolescents reported that in their first three years of life, both parents (64.8%), only their mother (23.2%) or father (0.4%), grandparents (6.1%), a nursery school (3%), or babysitters (0.6%) took care of them. In terms of role models, 79.6% of participants said that they admired an adult figure, of which approximately 53.3% claimed to admire their parents.

3.1.1 | Average scores of the LS, SDQ, and ASEBA questionnaires

Table 1 presents the average scores of the three questionnaires. Participants produced an average score of 1.2 (SD = 1.2) on the social loneliness subscale and 1.6 (SD = 1.1) on the emotional loneliness subscale. The total loneliness score was 2.7 (SD = 1.8), which is slightly above the cut-off (≥ 2), indicating the presence of loneliness. Most participants responded that there are plenty of people they can

rely on when they have problems (63.4%), that there are many people they can trust completely (51.9%) and that there are enough people they feel close to (66.7%). No significant differences were found between male and female groups.

Regarding the SDQ, the mean score of the emotional symptoms subscale ($M = 3.9$, $SD = 2.5$) was very close to the borderline range (>4). A significant difference was found between male and female groups. Emotional symptoms were higher in females than in males ($p < 0.001$); the same was highlighted for prosocial behaviors ($p < 0.001$) and total difficulties ($p = 0.018$).

School achievement was assessed using the competence scale of ASEBA, for which the mean score was 36.7 (SD = 9.7). Extracurricular activities were assessed using the activities scale, with a mean score of 35.2 (SD = 9.1). The scores for both school achievement and extracurricular activities were within the clinical range (<37).

The mean scores for two ASEBA DSM-oriented scales, namely, 57.7 (SD = 8.7) for depression problems and 57.8 (SD = 7.5) for anxiety problems, were very close to the borderline range (>60). These results are in line with the mean scores of the syndrome scales: 59.5 (SD = 9.9) on the anxious/depressed scale and 58.1 (SD = 9.6) on the withdrawn/depressed scale. A total of 20.4% respondents reported anxiety problems, while 22.2% reported experiencing depression.

A significant difference between male and female groups was found also in the ASEBA questionnaire. Competence scale scores were higher in males than in females ($p < 0.001$). Females group reported more somatic ($p < 0.001$) and attention ($p = 0.005$) problems than males group, which highlighted more conduct ($p = 0.036$) and externalizing ($p < 0.001$) problems.

The ASEBA also includes three questions on substance, which this study considered separately: one question pertaining to alcohol use and two questions pertaining to the use of tobacco and other drugs (e.g., marijuana). Results showed that 27.9% of adolescents reported drinking alcohol, 21.2% using tobacco and 4.2% other drugs.

3.1.2 | Correlation between loneliness, depression, anxiety, and total competence

Table 2 shows the correlations between loneliness, depression, anxiety, and total competence (i.e., school achievement). Results revealed a positive correlation between the anxiety and depression problem scores of the ASEBA subscales ($p < 0.001$), both of which were also positively correlated with the total loneliness score ($p < 0.001$). There was a negative correlation between the total competence score and anxiety ($p = 0.012$), depression ($p < 0.001$), and loneliness ($p = 0.004$).

3.1.3 | Comparison among main features of the sample, depression, anxiety, and loneliness

Table 3 shows the statistically significant differences between the main features of the sample, depression, anxiety, and loneliness.

TABLE 1 Average scores of the LS, SDQ, and ASEBA questionnaires.

| | Mean (SD) Total sample (n = 504) | Mean (SD) Female (n = 343) | Mean (SD) Male (n = 161) | p Value |
|--|-------------------------------------|-------------------------------|-----------------------------|-----------------|
| Mean age (SD) | 16.0 (1.9) | 15.9 (1.9) | 15.9 (2.0) | NS ^a |
| School level, n | | | | |
| First grade | 394 | 276 | 118 | NS ^b |
| Second grade | 110 | 67 | 43 | |
| LS | | | | |
| Social loneliness | 1.2 (1.2) | 1.2 | 1.2 | NS ^a |
| Emotional loneliness | 1.6 (1.1) | 1.6 | 1.5 | NS ^a |
| Total loneliness | 2.7 (1.8) | 2.8 | 2.7 | NS ^a |
| SDQ | | | | |
| Conduct problems | 2.2 (1.7) | 2.2 (1.6) | 2.2 (1.8) | NS ^a |
| Emotional symptoms | 3.9 (2.5) | 4.4 (2.5) | 2.9 (2.1) | <0.001 |
| Hyperactivity/inattention | 3.6 (2.0) | 3.5 (2.0) | 3.6 (1.9) | NS ^a |
| Peer relationship problems | 1.9 (1.7) | 1.8 (1.7) | 2.0 (1.8) | NS ^a |
| Prosocial behavior | 7.5 (1.9) | 7.7 (1.8) | 6.9 (2.0) | <0.001 |
| Total difficulties score | 11.6 (5.6) | 12.0 (5.7) | 10.7 (5.1) | 0.018 |
| ASEBA | | | | |
| Activities | 35.2 (9.1) | 34.7 (9.0) | 36.2 (9.2) | NS ^a |
| Sociality | 42.0 (8.5) | 41.6 (8.4) | 42.8 (8.8) | NS ^a |
| Competence scale | 36.7 (9.7) | 35.7 (9.7) | 38.8 (9.5) | <0.001 |
| Depression problems | 57.7 (8.7) | 57.8 (9.0) | 57.3 (8.0) | NS ^a |
| Anxiety problems | 57.8 (7.5) | 58.0 (7.4) | 57.6 (7.8) | NS ^a |
| Somatic problems | 56.5 (7.9) | 57.1 (7.7) | 55.3 (8.1) | <0.001 |
| Attention deficit/ hyperactivity problems | 55.0 (5.7) | 55.0 (5.9) | 55.0 (5.7) | NS ^a |
| Oppositional defiant problems | 56.0 (6.5) | 56.2 (6.8) | 55.6 (5.7) | NS ^a |
| Conduct problems | 53.0 (8.7) | 52.1 (8.8) | 54.7 (8.1) | 0.036 |
| Anxious/depressed | 59.5 (9.9) | 59.6 (10.5) | 59.2 (8.6) | NS ^a |
| Withdrawn/depressed | 58.1 (9.6) | 58.1 (10.1) | 57.9 (8.6) | NS ^a |
| Somatic complaints | 56.5 (7.5) | 57.0 (7.5) | 55.6 (7.5) | NS ^a |
| Social problems | 56.0 (7.3) | 55.9 (7.3) | 56.0 (7.2) | NS ^a |
| Thought problems | 55.2 (6.9) | 55.1 (6.8) | 55.3 (7.1) | NS ^a |
| Attention problems | 56.2 (6.9) | 56.5 (6.9) | 55.7 (6.8) | 0.005 |
| Rule breaking behavior | 54.8 (6.4) | 54.6 (5.8) | 55.1 (7.4) | NS ^a |
| Aggressive behavior | 55.6 (6.7) | 55.3 (6.4) | 56.0 (7.2) | NS ^a |
| Internalizing | 56.3 (11.5) | 56.7 (11.7) | 55.6 (11.1) | NS ^a |
| Externalizing | 48.4 (12.4) | 46.5 (12.9) | 52.5 (10.4) | <0.001 |
| Syndromic scale | 53.9 (10.2) | 53.9 (10.1) | 53.8 (10.5) | NS ^a |

Abbreviations: ASEBA, Achenbach System of Empirically Based Assessment; LS, Loneliness Scale; SDQ, Strengths and Difficulties Questionnaire.

^aMann-Whitney.

^b χ^2 ; $df = 1$.

TABLE 2 Correlation between loneliness, depression, anxiety, and total competence.

| | Total loneliness | Anxiety problems | Depression problems | Total competence |
|---------------------|------------------|------------------|---------------------|------------------|
| Total loneliness | - | | | -1.30 |
| Pearson correlation | | 0.377 | 0.441 | 0.004 |
| <i>p</i> Value | | <0.001 | <0.001 | |
| Anxiety problems | 0.377 | - | | -0.112 |
| Pearson correlation | <0.001 | | 0.684 | 0.012 |
| <i>p</i> Value | | | <0.001 | |
| Depression problems | 0.441 | 0.684 | - | -0.172 |
| Pearson correlation | <0.001 | <0.001 | | <0.001 |
| <i>p</i> Value | | | | |
| Total competence | -1.30 | -0.112 | -0.172 | - |
| Pearson correlation | 0.004 | 0.012 | <0.001 | |
| <i>p</i> Value | | | | |

Results show higher scores in depression problems, very close to the borderline range, among adolescents who reported the presence of recreation places near the home (a total of 70.9% of the sample) than those (29.1%) who reported a lack of such places near their residential area ($p = 0.017$). These results were also found for the loneliness scores ($p = 0.029$).

Respondents who did not live with their families also scored higher in depression problems (borderline range) than those who lived with their parents ($p < 0.001$). In contrast, anxiety problems were more frequent among those who lived with their families (borderline range) ($p < 0.001$). There was a significant difference in depression problem scores between respondents whose mothers had attended primary school or below, which fell within the borderline range, and those whose mothers had attended middle school ($p < 0.006$). Moreover, respondents who reported admiring adult figures had lower levels of loneliness than those who do not ($p = 0.010$).

Depression scores were higher (clinical range) among those who drink frequently compared to those who never drink ($p = 0.005$).

The same was found for anxiety scores ($p = 0.014$).

Nonsmokers scored lower in depression problems than those who smoke frequently ($p = 0.019$). Respondents who never use other drugs also scored lower in depression than those who frequently or sometimes use them ($p < 0.001$); both fell within the clinical range. Those who never use other drugs also had lower anxiety scores than those who frequently use them ($p = 0.012$), which fell within the clinical range.

A total of 14.3% of respondents reported intentionally harming themselves or attempting suicide, with increased depression, anxiety, and loneliness scores. As depression increased, so did the frequency of harm, suicidal ideation, and suicide. Participants who answered that they never intentionally harm themselves or have attempted suicide had lower scores in anxiety ($p < 0.001$) and loneliness ($p < 0.001$) than those who reported intentionally harming themselves or attempting suicide frequently or sometimes.

This study also explored the use of social networks, finding that respondents who answered that it was unnecessary to use social media to avoid social exclusion had lower depression scores than those who reported that it was necessary ($p = 0.007$). The former also had lower scores in both anxiety ($p = 0.002$) and loneliness ($p = 0.005$) than the latter. Those who reported that it was sometimes necessary to use social media to avoid social exclusion also had lower scores than those who answered that it was always necessary. Depression scores were higher among those who reported that the use of social networks made them feel good because they felt connected with others, compared to those who did not answered so ($p = 0.006$).

4 | DISCUSSION

Developed in northern Italy, this study began in March 2020, when the global COVID-19 pandemic erupted and soon enveloped Italy, which was one of the most affected countries. Collected data allow for the assessment of how Italian adolescents handled this complex period. This study identified the associations between loneliness, depression, anxiety, suicidal ideation, social networks, and school achievement. Results showed a correlation between anxiety, depression, and loneliness in the sample. Higher scores in depression problems were detected among adolescents who did not live with their families, result in line with the international literature. A higher presence of depressive symptoms was also detected in those adolescents whose mothers had a low level of education (primary school or below), data that indicates a possible association between depression and socioeconomic status, thus confirming the previously cited data from international studies, which highlight how adolescents living in families with low socioeconomic status may be more vulnerable to depressive symptoms. Higher scores in depression problems were found among those adolescents who frequently drank, smoked, or used drugs and also this result is confirmed by international literature.

TABLE 3 Comparison among main features of the sample, depression, anxiety, and loneliness.

| | % | Depression mean (SD) | p Value (post-hoc) | Anxiety mean (SD) | p Value (post-hoc) | Total loneliness mean (SD) | p Value (post-hoc) |
|---|------|----------------------|------------------------------|-------------------|------------------------------|----------------------------|------------------------------|
| Presence of recreation places where you live | | | | | | | |
| Yes | 70.9 | 59.4 (9.6) | 0.017^a | 58.8 (7.8) | NS ^a | 3.0 (2.0) | 0.029^a |
| No | 29.1 | 56.9 (8.2) | | 57.5 (7.4) | | 2.6 (1.8) | |
| Do you live with your family? | | | | | | | |
| Yes | 85.5 | 57.1 (8.7) | <0.001^a | 60.5 (7.7) | <0.001^a | 2.7 (1.8) | NS ^a |
| No | 14.5 | 61.1 (7.9) | | 57.4 (7.4) | | 3.0 (2.0) | |
| Mother's educational level | | | | | | | |
| Primary school or lower (1) | 4.4 | 62.3 (10.9) | 0.006^b | 60.3 (7.7) | NS ^b | 3.5 (2.0) | NS ^b |
| Middle school (2) | 25.5 | 56.3 (8.0) | (1 vs. 2) | 57.2 (7.3) | | 2.5 (1.8) | |
| High school (3) | 52.5 | 57.5 (8.1) | | 58.0 (7.6) | | 2.8 (1.9) | |
| College or higher (4) | 15.8 | 59.5 (10.5) | | 57.9 (7.9) | | 2.7 (1.8) | |
| Do you admire some adult figure? | | | | | | | |
| Yes | 79.6 | 57.5 (8.3) | NS ^a | 57.6 (7.2) | NS ^a | 2.6 (1.8) | 0.010^a |
| No | 20.4 | 58.4 (10.0) | | 58.7 (8.5) | | 3.1 (1.8) | |
| Alcohol use | | | | | | | |
| False (1) | 71.5 | 57.1 (8.5) | 0.005^b | 57.3 (7.3) | 0.014^b | 2.7 (1.8) | NS ^b |
| Sometimes true (2) | 21.0 | 58.3 (9.1) | (1 vs. 3) | 58.9 (8.0) | (1 vs. 3) | 2.7 (1.9) | |
| Very true (3) | 6.9 | 62.0 (8.5) | | 60.6 (7.4) | | 3.4 (1.8) | |
| Tobacco | | | | | | | |
| False (1) | 78.2 | 57.1 (8.4) | 0.019^b | 57.7 (7.6) | NS ^b | 2.7 (1.8) | NS ^b |
| Sometimes true (2) | 9.3 | 59.3 (8.2) | (1 vs. 3) | 58.3 (7.2) | | 3.1 (1.7) | |
| Very true (3) | 11.9 | 60.1 (10.5) | | 58.2 (7.4) | | 2.5 (2.0) | |
| Other drugs | | | | | | | |
| False (1) | 95.2 | 57.2 (8.3) | <0.001^b | 57.7 (7.5) | 0.012^b | 2.7 (1.8) | NS ^b |
| Sometimes true (2) | 2.4 | 65.0 (8.5) | (1 vs. 2, 3) | 59.4 (6.2) | (1 vs. 3) | 3.8 (1.5) | |
| Very true (3) | 1.8 | 71.9 (14.6) | | 65.0 (8.7) | | 2.3 (2.3) | |
| I intentionally harm myself or have attempted suicide | | | | | | | |
| False (1) | 85.1 | 56.1 (7.3) | <0.001^b | 56.8 (7.0) | <0.001^b | 2.6 (1.8) | <0.001^b |
| Sometimes true (2) | 10.9 | 65.2 (7.8) | (each vs. others) | 63.2 (7.1) | (1 vs. 2, 3) | 3.6 (1.9) | (1 vs. 2, 3) |
| Very true (3) | 3.4 | 72.2 (15.3) | | 66.2 (8.9) | | 4.0 (1.9) | (1 vs. 2,3) |
| Using social networks is necessary in order not to be excluded | | | | | | | |
| False (1) | 31.5 | 56.5 (8.1) | 0.007 | 56.7 (7.3) | 0.002 | 2.6 (1.9) | 0.005 |
| Sometimes true (2) | 42.6 | 57.3 (8.9) | (1 vs. 3) | 57.5 (7.3) | (1 vs. 3, 2 vs. 3) | 2.6 (1.7) | (1 vs. 3, 2 vs. 3) |
| Very true (3) | 25.3 | 59.6 (8.8) | | 59.8 (7.9) | | 3.2 (1.9) | |
| Using social networks makes me feel good because I can feel connected with others | | | | | | | |
| False (1) | 19.2 | 55.7 (6.7) | 0.006 | 56.7 (7.0) | NS | 2.5 (1.9) | NS |
| Sometimes true (2) | 38.6 | 57.2 (8.5) | (1 vs. 3) | 57.8 (7.4) | | 2.9 (1.9) | |
| Very true (3) | 41.6 | 59.0 (9.5) | | 58.4 (7.9) | | 2.7 (1.8) | |

Note: Bold values indicate statistical significance.

^aMann-Whitney.

^bOne-way analysis of variance.

Regarding socialization, higher scores of depressive symptoms were highlighted among adolescents who thought it necessary to use social media to avoid exclusion and who found that the use of social networks made them feel good because they felt connected with other people. Interestingly, adolescents who reported the presence of recreational places near their homes scored higher in depression problems. This result may be due to the restrictions imposed by governments to curb the spread of the SARS-CoV-2 infection, particularly those prohibiting extracurricular activities. Adolescents who attended such activities near their homes felt more frustrated than those who did not have the opportunity to meet friends and peers in these places before the lockdown restrictions. These results align with the data we found in the literature.

In this study, adolescents who lived with their families, often drank or used drugs, and who considered it necessary to use social media to avoid social exclusion scored higher in anxiety problems, as also confirmed by international research. The adolescents in our sample produced worrying scores for loneliness, especially those who did not admire adults and considered it necessary to use social media to avoid exclusion. This study's findings align with those in literature showing that persistent feelings of loneliness were less prevalent among young people who felt virtually connected with others during the pandemic. In our study, loneliness were less prevalent among those adolescents who reported the presence of adult reference figures, with particular admiration for their parents. The majority of respondents reported that their parents took care of them during their first 3 years of life, a crucial period in neurocognitive development (Imbasciati & Cena, 2018, 2020) that can impact adolescence and adulthood (Tirumalaraju et al., 2020).

Results also show an association between anxiety, depression, loneliness, and school achievement. In short, the more adolescents felt anxious, depressed, and lonely, the worse their competence in school achievement. This finding is supported by an Italian study conducted during the COVID-19 pandemic that demonstrated an association between loneliness and low school achievement (Muzi et al., 2022).

Our study also explored emotional dysregulation in respect to the association between affective disorders and addiction in its sample of Italian adolescents in the first or second grade of high school. Alcohol and drug self-addiction appear to have regulated depression and anxiety symptoms, whereas tobacco appear to have only regulated depressive symptoms. Young people frequently turned to social media to deal with emotional dysregulation due to distress, anxiety, and loneliness resulting from the lack of social contact during the COVID-19 pandemic.

Regarding differences between male and female groups, the results showed that females reported higher emotional symptoms and somatic problems than males, a result that can be found in the adolescence period in which females are more oriented toward aspects pertain body. Females scored lower on the competence scale. This negative result on females' scholastic performance could also be explained by low scores in attention. Conduct and externalizing problems were predominantly detected in males' group, while females reported a higher presence of prosocial behaviors.

A limitation to point out is that, despite the fact that for the recruitment of the sample of adolescent's males and females were invited to participate in equal numbers, a majority of females agreed to participate and answer the questions in the questionnaires. Another limitation of this study is that our data are explorative, no correction for multiple comparisons was applied.

Significantly, the results of this study raise a worrying concern: a substantial proportion of the surveyed adolescents admitted to intentionally harming themselves or attempting suicide during the pandemic, with such behavior found to be associated with higher scores for depression, anxiety, and loneliness. International research has similarly confirmed an increase in self-harm and/or attempted suicide among adolescents during the pandemic.

5 | CONCLUSIONS

In this study, the sample of surveyed adolescents revealed problems for school achievements and extracurricular activities, which are likely due to the closure of schools and social centers during the COVID-19 pandemic. This study's sample revealed several concerns, including emotional dysregulation with the presence of affective disorders (anxiety and depression, very close to the borderline range) and self-regulation with substance use (alcohol and other drugs). It is particularly important to point out the presence of suicidal ideation, which must be brought to the attention of adult reference figures who deal with adolescents, such as parents, teachers, and healthcare professionals, so that they can provide early interventions aimed at preventing psychopathologies and promoting adolescent mental health.

AUTHOR CONTRIBUTIONS

Loredana Cena conceived the study design. Material preparation and data collection were performed by Sara Zecca, Sofia Bonetti Zappa, Alice Trainini, and Federica Cunegatti. Chiara Buizza designed the statistical analysis plan and conducted the data elaboration. The manuscript was written, reviewed and edited by Loredana Cena, Alice Trainini, and Chiara Buizza. All authors read and approved the final manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ETHICS STATEMENT

The study was approved by the Ethics Committee of the ASST Spedali Civili of Brescia (NP3862). Research was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its later amendments. Participants were informed that their participation was confidential, anonymous, and voluntary, and that their personal data would be respected.

REFERENCES

- Achenbach, T. (2001). ASEBA; Achenbach system of empirically based assessment: School age forms and profiles, child behavior checklist for ages 6-18.
- Ali, F., Russell, C., Nafeh, F., Chaufan, C., Imtiaz, S., Rehm, J., Spafford, A., & Elton-Marshall, T. (2022). Youth substance use service provider's perspectives on use and service access in Ontario: Time to reframe the discourse. *Substance Abuse Treatment, Prevention, and Policy*, 17(1), 9. <https://doi.org/10.1186/s13011-022-00435-9>
- Amendola, S. (2022). Burden of mental health and substance use disorders among Italian young people aged 10-24 years: Results from the Global Burden of Disease 2019 Study. *Social Psychiatry and Psychiatric Epidemiology*, 57(4), 683-694. <https://doi.org/10.1007/s00127-022-02222-0>
- Babore, A., Morelli, M., & Trumello, C. (2022). Italian adolescents' adjustment before and during the coronavirus disease 2019: A comparison between mothers' and adolescents' perception. *British Journal of Clinical Psychology*, 61(2), 281-286. <https://doi.org/10.1111/bjc.12334>
- Becker, S. P., & Gregory, A. M. (2020). Editorial perspective: Perils and promise for child and adolescent sleep and associated psychopathology during the COVID-19 pandemic. *Journal of Child Psychology and Psychiatry*, 61(7), 757-759. <https://doi.org/10.1111/jcpp.13278>
- Biagioni, S., Baldini, F., Baroni, M., Cerrai, S., Melis, F., Potente, R., Scalese, M., & Molinaro, S. (2022). Adolescents' psychoactive substance use during the first COVID-19 lockdown: A cross sectional study in Italy. *Child & Youth Care Forum*, 1-19. <https://doi.org/10.1007/s10566-022-09701-0>
- Caffo, E., Scandroglio, F., & Asta, L. (2020). Debate: COVID-19 and psychological well-being of children and adolescents in Italy. *Child and Adolescent Mental Health*, 25(3), 167-168. <https://doi.org/10.1111/camh.12405>
- Caubergh, V., Van Wesenbeeck, I., De Jans, S., Hudders, L., & Ponnet, K. (2021). How adolescents use social media to cope with feelings of loneliness and anxiety during COVID-19 lockdown. *Cyberpsychology, Behavior and Social Networking*, 24(4), 250-257. <https://doi.org/10.1089/cyber.2020.0478>
- Cena, L., Rota, M., Calza, S., Trainini, A., Zecca, S., Bonetti Zappa, S., & Stefana, A. (2022). Prevalence and types of video gaming and gambling activities among adolescent public school students: Findings from a cross-sectional study in Italy. *Italian Journal of Pediatrics*, 48(1), 108. <https://doi.org/10.1186/s13052-022-01299-2>
- Cena, L., Rota, M., Trainini, A., Zecca, S., Bonetti Zappa, S., Tralli, N., & Stefana, A. (2022). Investigating adolescents' video gaming and gambling activities, and their relationship with behavioral, emotional, and social difficulties: Protocol for a multi-informant study. *JMIR Research Protocols*, 11(2), e33376. <https://doi.org/10.2196/33376>
- Chaiton, M., Dubray, J., Kundu, A., & Schwartz, R. (2022). Perceived impact of COVID on smoking, vaping, alcohol and cannabis use among youth and youth adults in Canada. *The Canadian Journal of Psychiatry*, 67(5), 407-409. <https://doi.org/10.1177/07067437211042132>
- Chen, F., Zheng, D., Liu, J., Gong, Y., Guan, Z., & Lou, D. (2020). Depression and anxiety among adolescents during COVID-19: A cross-sectional study. *Brain, Behavior, and Immunity*, 88, 36-38. <https://doi.org/10.1016/j.bbi.2020.05.061>
- Christiansen, J., Qualter, P., Friis, K., Pedersen, S., Lund, R., Andersen, C., Bekker-Jepesen, M., & Lasgaard, M. (2021). Associations of loneliness and social isolation with physical and mental health among adolescents and young adults. *Perspectives in Public Health*, 141(4), 226-236. <https://doi.org/10.1177/17579139211016077>
- Collings, A. T., Farazi, M., Van Arendonk, K., Fallat, M. E., Minneci, P. C., Sato, T. T., Deans, K. J., Falcone, R. A., Foley, D. S., Fraser, J. D., Keller, M. S., Kotagal, M., Landman, M. P., Leys, C. M., Markel, T., Rubalcava, N., St Peter, S. D., Flynn-O'Brien, K. T., & Midwest Pediatric Surgery Consortium. (2022). Impact of "Stay-at-Home" orders on non-accidental trauma: A multi-institutional study. *Journal of Pediatric Surgery*, 57(6), 1062-1066. <https://doi.org/10.1016/j.jpedsurg.2022.01.056>
- Conti, E., Sgandurra, G., De Nicola, G., Biagioni, T., Boldrini, S., Bonaventura, E., Buchignani, B., Della Vecchia, S., Falcone, F., Fedi, C., Gazzillo, M., Marinella, G., Mazzullo, C., Micomonaco, J., Pantalone, G., Salvati, A., Sesso, G., Simonelli, V., Tolomei, G., ... Battini, R. (2020). Behavioural and emotional changes during COVID-19 lockdown in an Italian paediatric population with neurologic and psychiatric disorders. *Brain Sciences*, 10(12), 918. <https://doi.org/10.3390/brainsci10120918>
- Corsano, P. (2018). La solitudine del preadolescente e dell'adolescente. In G. Scuola, (Ed.), *Psicologia e Scuola* (38th ed., Vol. 55, pp. 30-38). Giunti Scuola.
- Ellis, W. E., Dumas, T. M., & Forbes, L. M. (2020). Physically isolated but socially connected: Psychological adjustment and stress among adolescents during the initial COVID-19 crisis. *Canadian Journal of Behavioural Science/Revue Canadienne des Sciences du Comportement*, 52(3), 177-187. <https://doi.org/10.1037/cbs0000215>
- Essau, C. A., & de la Torre-Luque, A. (2021). Adolescent psychopathological profiles and the outcome of the COVID-19 pandemic: Longitudinal findings from the UK Millennium Cohort Study. *Progress in Neuro-psychopharmacology & Biological Psychiatry*, 110, 110330. <https://doi.org/10.1016/j.pnpbp.2021.110330>
- Fegert, J. M., Vitiello, B., Plener, P. L., & Clemens, V. (2020). Challenges and burden of the coronavirus 2019 (COVID-19) pandemic for child and adolescent mental health: A narrative review to highlight clinical and research needs in the acute phase and the long return to normality. *Child and Adolescent Psychiatry and Mental Health*, 14, 20. <https://doi.org/10.1186/s13034-020-00329-3>
- Frigerio, A., Cattaneo, C., Cataldo, M., Schiatti, A., Molteni, M., & Battaglia, M. (2004). Behavioral and emotional problems among Italian children and adolescents aged 4 to 18 years as reported by parents and teachers. *European Journal of Psychological Assessment*, 20(2), 124-133. <https://doi.org/10.1027/1015-5759.20.2.124>
- Goodman, R. (1997). The Strengths and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38(5), 581-586. <https://doi.org/10.1111/j.1469-7610.1997.tb01545.x>
- Guo, Y., Liao, M., Cai, W., Yu, X., Li, S., Ke, X., Tan, S., Luo, Z., Cui, Y., Wang, Q., Gao, X., Liu, J., Liu, Y., Zhu, S., & Zeng, F. (2021). Physical activity, screen exposure and sleep among students during the pandemic of COVID-19. *Scientific Reports*, 11(1), 8529. <https://doi.org/10.1038/s41598-021-88071-4>
- Hawke, L. D., Barbic, S. P., Voineskos, A., Szatmari, P., Cleverley, K., Hayes, E., Relihan, J., Daley, M., Courtney, D., Cheung, A., Darnay, K., & Henderson, J. L. (2020). Impacts of COVID-19 on youth mental health, substance use, and well-being: A rapid survey of clinical and community samples. *The Canadian Journal of Psychiatry*, 65(10), 701-709. <https://doi.org/10.1177/0706743720940562>

- Hen, M., Shenaar-Golan, V., & Yatzker, U. (2022). Children and adolescents' mental health following COVID-19: The possible role of difficulty in emotional regulation. *Frontiers in Psychiatry*, 13, 865435. <https://doi.org/10.3389/fpsy.2022.865435>
- Hou, T., Xie, Y., Mao, X., Liu, Y., Zhang, J., Wen, J., Chen, Y., Luo, Z., & Cai, W. (2021). The mediating role of loneliness between social support and depressive symptoms among Chinese rural adolescents during COVID-19 outbreak: A comparative study between left-behind and non-left-behind students. *Frontiers in Psychiatry*, 12, 740094. <https://doi.org/10.3389/fpsy.2021.740094>
- Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: A web-based cross-sectional survey. *Psychiatry Research*, 288, 112954. <https://doi.org/10.1016/j.psychres.2020.112954>
- Imbasciati, A., & Cena, L. (2018). *Psicologia Clinica Perinatale. Il futuro dei primi mille giorni di vita*. Franco Angeli.
- Imbasciati, A., & Cena, L. (2020). *Psicologia clinica perinatale babycentered. Come si costruisce la mente umana*. Franco Angeli.
- Imran, N., Zeshan, M., & Pervaiz, Z. (2020). Mental health considerations for children & adolescents in COVID-19 pandemic. *Pakistan Journal of Medical Sciences*, 36(COVID19-S4), 67–72. <https://doi.org/10.12669/pjms.36.COVID19-S4.2759>
- Jefsen, O. H., Rohde, C., Nørremark, B., & Østergaard, S. D. (2020). Editorial perspective: COVID-19 pandemic-related psychopathology in children and adolescents with mental illness. *Journal of Child Psychology and Psychiatry*, 62(6), 798–800. <https://doi.org/10.1111/jcpp.13292>
- Johnson, H. D., LaVoie, J. C., Spenceri, M. C., & Mahoney-Wernli, M. A. (2001). Peer conflict avoidance: Associations with loneliness, social anxiety, and social avoidance. *Psychological Reports*, 88(1), 227–235. <https://doi.org/10.2466/pr0.2001.88.1.227>
- 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), 2470. <https://doi.org/10.3390/ijerph18052470>
- Jones, S. E., Ethier, K. A., Hertz, M., DeGue, S., Le, V. D., Thornton, J., Lim, C., Dittus, P. J., & Geda, S. (2022). Mental health, suicidality, and connectedness among high school students during the COVID-19 pandemic—Adolescent behaviors and experiences survey, United States, January–June 2021. *MMWR Supplements*, 71(3), 16–21. <https://doi.org/10.15585/mmwr.su7103a3>
- De Jong Gierveld, J., & Tilburg, T. V. (2006). A 6-item scale for overall, emotional, and social loneliness: Confirmatory tests on survey data. *Research on Aging*, 28(5), 582–598. <https://doi.org/10.1177/0164027506289723>
- Kapetanovic, S., Ander, B., Gurdal, S., & Sorbring, E. (2022). Adolescent smoking, alcohol use, inebriation, and use of narcotics during the Covid-19 pandemic. *BMC Psychology*, 10(1), 44. <https://doi.org/10.1186/s40359-022-00756-1>
- Kayaoglu, K., & Başçillar, M. (2022). Determining the relationship between loneliness and depression in adolescents during the COVID-19 pandemic: A cross-sectional survey. *Journal of Child and Adolescent Psychiatric Nursing*, 35, 315–321. <https://doi.org/10.1111/jcap.12384>
- Li, S. H., Beames, J. R., Newby, J. M., Maston, K., Christensen, H., & Werner-Seidler, A. (2021). The impact of COVID-19 on the lives and mental health of Australian adolescents. *European Child & Adolescent Psychiatry*, 31, 1–13. <https://doi.org/10.1007/s00787-021-01790-x>
- 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), 8547. <https://doi.org/10.3390/ijerph17228547>
- Liu, R., Chen, X., Qi, H., Feng, Y., Su, Z., Cheung, T., & Xiang, Y. T. (2022). Network analysis of depressive and anxiety symptoms in adolescents during and after the COVID-19 outbreak peak. *Journal of Affective Disorders*, 301, 463–471. <https://doi.org/10.1016/j.jad.2021.12.137>
- Liu, S., Zou, S., Zhang, D., Wang, X., & Wu, X. (2022). Problematic Internet use and academic engagement during the COVID-19 lockdown: The indirect effects of depression, anxiety, and insomnia in early, middle, and late adolescence. *Journal of Affective Disorders*, 309, 9–18. <https://doi.org/10.1016/j.jad.2022.04.043>
- Loades, M. E., Chatburn, E., Higson-Sweeney, N., Reynolds, S., Shafran, R., Brigden, A., Linney, C., McManus, M. N., Borwick, C., & Crawley, E. (2020). Rapid systematic review: The impact of social isolation and loneliness on the mental health of children and adolescents in the context of COVID-19. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(11), 1218–1239. <https://doi.org/10.1016/j.jaac.2020.05.009>
- Magsion, N. R., Freeman, J. Y. A., Rapee, R. M., Richardson, C. E., Oar, E. L., & Fardouly, J. (2021). Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. *Journal of Youth and Adolescence*, 50(1), 44–57. <https://doi.org/10.1007/s10964-020-01332-9>
- Manivannan, M., Jogalekar, M. P., Kavitha, M. S., Maran, B. A. V., & Gangadaran, P. (2021). A mini-review on the effects of COVID-19 on younger individuals. *Experimental Biology and Medicine*, 246(3), 293–297. <https://doi.org/10.1177/1535370220975118>
- Marciano, L., Ostroumova, M., Schulz, P. J., & Camerini, A. L. (2022). Digital media use and adolescents' mental health during the Covid-19 pandemic: A systematic review and meta-analysis. *Frontiers in Public Health*, 9, 793868. <https://doi.org/10.3389/fpubh.2021.793868>
- Moore, S. A., Faulkner, G., Rhodes, R. E., Brussoni, M., Chulak-Bozzer, T., Ferguson, L. J., Mitra, R., O'Reilly, N., Spence, J. C., Vanderloo, L. M., & Tremblay, M. S. (2020). Impact of the COVID-19 virus outbreak on movement and play behaviours of Canadian children and youth: A national survey. *International Journal of Behavioral Nutrition and Physical Activity*, 17(1), 85. <https://doi.org/10.1186/s12966-020-00987-8>
- Musetti, A., Corsano, P., Boursier, V., & Schimmenti, A. (2020). Problematic internet use in lonely adolescents: The mediating role of detachment from parents. *Clinical Neuropsychiatry*, 17(1), 3–10. <https://doi.org/10.36131/clinicalpsych20200101>
- Muzi, S., Rogier, G., & Pace, C. S. (2022). Peer power! secure peer attachment mediates the effect of parental attachment on depressive withdrawal of teenagers. *International Journal of Environmental Research and Public Health*, 19, 4068. <https://doi.org/10.3390/ijerph19074068>
- OPL Ordine degli Psicologi della Lombardia (2022). La condizione adolescenziale nella pandemia da covid-19: Profili di rischio e fattori di adattamento positivo. Ordine degli Psicologi della Lombardia. https://www.opl.it/public/files/18876-OPL_Dossier_Adolescenti-e-pandemia.pdf
- Pace, C. S., & Muzi, S. (2019). Binge-eating symptoms, emotional-behavioral problems and gender differences among adolescents: A brief report. *Mediterranean Journal of Clinical Psychology*, 7(2). <https://doi.org/10.6092/2282-1619/2019.7.2161>
- Panda, P. K., Gupta, J., Chowdhury, S. R., Kumar, R., Meena, A. K., Madaan, P., Sharawat, I. K., & Gulati, S. (2021). Psychological and behavioral impact of lockdown and quarantine measures for COVID-19 pandemic on children, adolescents and caregivers: A systematic review and meta-analysis. *Journal of Tropical Pediatrics*, 67(1), fmaa122. <https://doi.org/10.1093/tropej/fmaa122>
- Pealer, L., & Weiler, R. M. (2003). Guidelines for designing a web-delivered college health risk behavior survey: Lessons learned from the University of Florida Health Behavior Survey. *Health Promotion Practice*, 4(2), 171–179. <https://doi.org/10.1177/1524839902250772>
- Pisano, S., Catone, G., Gritti, A., Almerico, L., Pezzella, A., Santangelo, P., Bravaccio, C., Iuliano, R., & Senese, V. P. (2021). Emotional

- symptoms and their related factors in adolescents during the acute phase of Covid-19 outbreak in South Italy. *Italian Journal of Pediatrics*, 47(1), 86. <https://doi.org/10.1186/s13052-021-01036-1>
- Primi, C., Fioravanti, G., Casale, S., & Donati, M. A. (2021). Measuring problematic facebook use among adolescents and young adults with the bergen facebook addiction scale: A psychometric analysis by applying item response theory. *International Journal of Environmental Research and Public Health*, 18(6), 2979. <https://doi.org/10.3390/ijerph18062979>
- Raballo, A., Poletti, M., Valmaggia, L., & McGorry, P. D. (2021). Editorial perspective: Rethinking child and adolescent mental health care after COVID-19. *Journal of Child Psychology and Psychiatry*, 62(9), 1067–1069. <https://doi.org/10.1111/jcpp.13371>
- Romano, I., Patte, K. A., de Groh, M., Jiang, Y., Wade, T. J., Bélanger, R. E., & Leatherdale, S. T. (2021). Substance-related coping behaviours among youth during the early months of the COVID-19 pandemic. *Addictive Behaviors Reports*, 14, 100392. <https://doi.org/10.1016/j.abrep.2021.100392>
- Serra, G., Lo Scalzo, L., Giuffrè, M., Ferrara, P., & Corsello, G. (2021). Smartphone use and addiction during the coronavirus disease 2019 (COVID-19) pandemic: Cohort study on 184 Italian children and adolescents. *Italian Journal of Pediatrics*, 47(1), 150. <https://doi.org/10.1186/s13052-021-01102-8>
- Serra, M., Presicci, A., Quaranta, L., Urbano, M. R. E., Marzulli, L., Matera, E., Margari, F., & Margari, L. (2022). Depressive risk among Italian socioeconomically disadvantaged children and adolescents during COVID-19 pandemic: A cross-sectional online survey. *Italian Journal of Pediatrics*, 48(1), 68. <https://doi.org/10.1186/s13052-022-01266-x>
- Shapiro, O., Gannot, R. N., Green, G., Zigdon, A., Zwilling, M., Giladi, A., Ben-Meir, L., Adilson, M., Barak, S., Harel-Fisch, Y., & Tesler, R. (2022). Risk behaviors, family support, and emotional health among adolescents during the COVID-19 pandemic in Israel. *International Journal of Environmental Research and Public Health*, 19(7), 3850. <https://doi.org/10.3390/ijerph19073850>
- Smirni, P., Lavanco, G., & Smirni, D. (2020). Anxiety in older adolescents at the time of COVID-19. *Journal of Clinical Medicine*, 9(10), 3064. <https://doi.org/10.3390/jcm9103064>
- Temple, J. R., Baumler, E., Wood, L., Guillot-Wright, S., Torres, E., & Thiel, M. (2022). The impact of the COVID-19 pandemic on adolescent mental health and substance use. *Journal of Adolescent Health*, 71(3), 277–284. <https://doi.org/10.1016/j.jadohealth.2022.05.025>
- Tirumalaraju, V., Suchting, R., Evans, J., Goetzl, L., Refuerzo, J., Neumann, A., Anand, D., Ravikumar, R., Green, C. E., Cowen, P. J., & Selvaraj, S. (2020). Risk of depression in the adolescent and adult offspring of mothers with perinatal depression: A systematic review and meta-analysis. *JAMA Network Open*, 3(6), e208783. <https://doi.org/10.1001/jamanetworkopen.2020.8783>
- Tobia, V., Gabriele, M. A., & Marzocchi, G. M. (2011). Norme italiane dello Strengths and Difficulties Questionnaire (SDQ): Il comportamento dei bambini italiani valutato dai loro insegnanti. *Disturbi di Attenzione e Iperattività*, 6(2), 15–22.
- Wang, J., Yang, Y., Lin, H., Richards, M., Yang, S., Liang, H., Chen, X., & Fu, C. (2021). Impact of psychosocial stressors on emotional and behavioral problems in Chinese adolescents during the COVID-19 period: The explanatory value of loneliness. *Translational Pediatrics*, 10(11), 2929–2940. <https://doi.org/10.21037/tp-21-300>
- Wang, Z. H., Yang, H. L., Yang, Y. Q., Liu, D., Li, Z. H., Zhang, X. R., Zhang, Y. J., Shen, D., Chen, P. L., Song, W. Q., Wang, X. M., Wu, X. B., Yang, X. F., & Mao, C. (2020). Prevalence of anxiety and depression symptom, and the demands for psychological knowledge and interventions in college students during COVID-19 epidemic: A large cross-sectional study. *Journal of Affective Disorders*, 275, 188–193. <https://doi.org/10.1016/j.jad.2020.06.034>
- WHO. (2021). Retrieved September 27, 2022. Retrieved September 27, 2022. <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>
- Zhen, R., Li, L., Li, G., & Zhou, X. (2021). Social isolation, loneliness, and mobile phone dependence among adolescents during the COVID-19 pandemic: Roles of parent-child communication patterns. *International Journal of Mental Health and Addiction*, 1–15. <https://doi.org/10.1007/s11469-021-00700-1>

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