

Review

Youth psychosocial resilience during the COVID-19 pandemic

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Abstract

Globally, youth have experienced heightened levels of stress due to the COVID-19 pandemic, though many youth showed resilience to mental health problems despite this increased stress. The current review covers emerging literature published in the past three years on resilience factors that promote more positive mental health in youth ages 10–18 years. These factors generally fall into three categories: 1) resilience factors at the level of the individual, 2) social resilience factors, and 3) interventions to enhance youth resilience during the pandemic. We include recommendations for future longitudinal research to better understand and promote resilience given the context of the pandemic, particularly for youth who experienced high levels of adversity.

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Although rates of youth mental health problems were increasing in the years before the COVID-19 pandemic began [1,2], mental health problems during the COVID-19 pandemic have increased at an even greater rate than pre-pandemic [3,4]. Psychosocial stress is a primary contributor to mental health problems, and the pandemic introduced several stressors that were particularly potent for youth [5]. For example, social distancing measures during the early pandemic forced most youth to stay at home rather than interact with peers, which is contrary to adolescents' goals of successfully navigating relationships with people outside

the family context. To this end, youth reported academic, family, friend, financial, and sickness-related challenges due to the pandemic [5]. Many youth experienced more extreme stressors such as death of a primary caregiver [6] or significant financial problems, including caregiver job loss [7]. Despite these major stressors, not all youth experienced increases in mental health problems, or they may have experienced fewer mental health problems than expected given a high burden of stress [8]. We focus in this review on the growing body of research examining factors associated with youth resilience during the COVID-19 pandemic globally, including interventions to promote resilience.

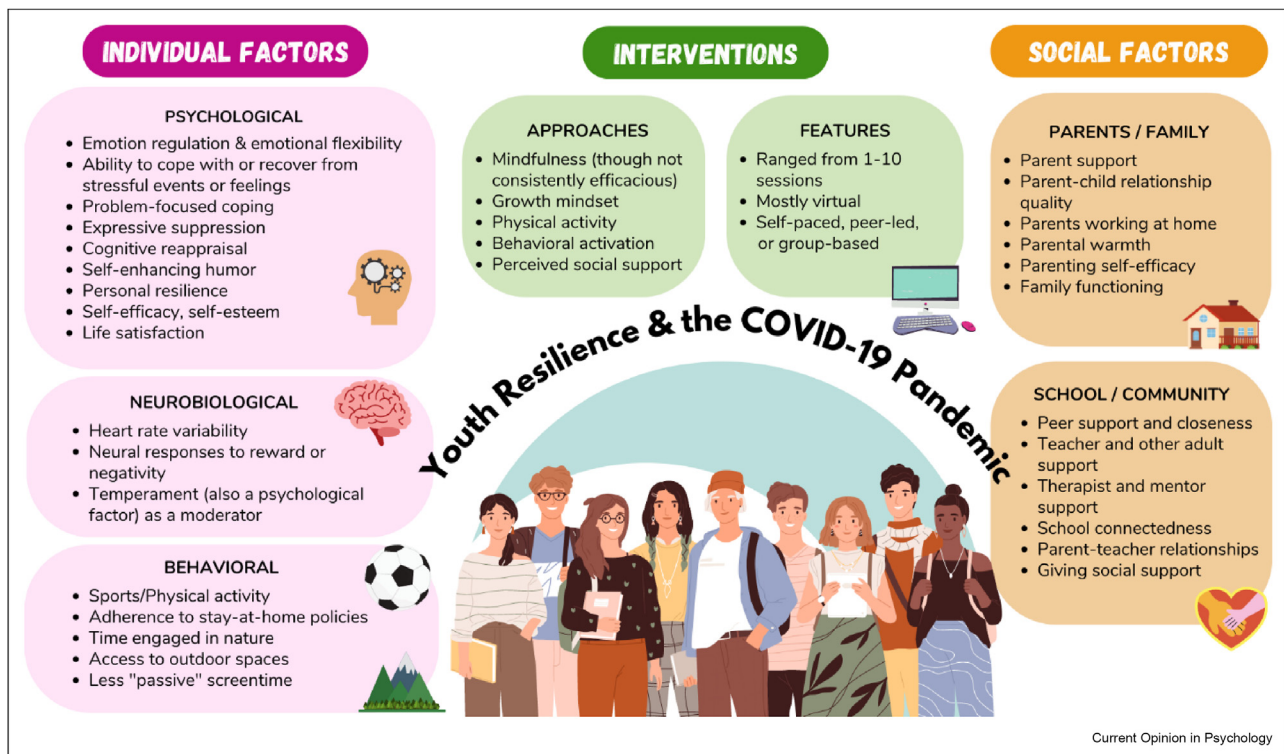
The current review will focus on resilience, or the process by which youth (ages 10–18 years) successfully adapt to challenges and show more positive psychosocial outcomes than we would expect given their circumstances. The current review is divided into three sections: 1) resilience factors at the level of the individual (e.g., emotion regulation skills, high self-esteem, youth activities), 2) social resilience factors (e.g., high social support), and 3) interventions to enhance resilience in youth (Figure 1). We then follow these sections with recommendations for future research on resilience in the context of the pandemic, which may inform future responses to global public health emergencies.

Individual resilience factors

The bulk of research on individual resilience factors for youth in the context of the COVID-19 pandemic has focused on emotion regulation. Youth with better pre-pandemic emotion regulation skills experienced fewer increases in a variety of mental health symptoms compared to youth with poorer emotion regulation skills [9]. The ability to recover quickly from adverse events or negative emotional states and greater emotional flexibility may have protected youth against poorer mental health [10,11]. Specific strategies such as problem-focused coping [12], frequent expressive suppression [13], and high cognitive reappraisal and self-enhancing humor [14] are also protective for youth mental health.

Several studies have examined resilience as a personal factor associated with youth mental health during the

Figure 1



An overview of individual and social factors and interventions associated with youth resilience during the COVID-19 pandemic.

COVID-19 pandemic. Personal resilience is generally conceptualized as youth's capability to cope with stressful events and negative feelings. In the context of the pandemic, personal resilience often included self-efficacy and seeking out social support [15,16], perseverance, emotion regulation, and positive thinking [17]. Personal resilience and related factors such as higher self-efficacy, self-esteem, and life satisfaction have been linked to better youth mental health (e.g., reduced anxiety, depressive symptoms, behavior problems, and psychological distress) during the pandemic [15–18].

In addition to emotion regulation and personal resilience, several studies have investigated the associations of individual behaviors and youth activities with mental health. Multiple studies have reported that youth who spent more time in nature and had more access to outdoor spaces reported lower internalizing symptoms [19,20], better general mental health [21], and better subjective well-being [22]. Youth who engaged in physical activity and sports participation and adhered to stay-at-home policies similarly had lower symptoms of anxiety and depression [23–25].

Other studies have explored potential benefits of lower screentime for youth [20,21,26,27]. Studies that focus on more "passive" screentime, which includes activities

such as social media scrolling, TV viewing, and video games, have found that lower screentime can be beneficial for youth mental health during the pandemic [20,21]. However, screentime that is used for socialization (e.g., texting, video calls), rather than passive activities, may be protective. One longitudinal study found that youth who increased their digital socialization during the pandemic were protected from later increases in internalizing symptoms in the face of pandemic-related stress [27]. These studies document that more time outside in nature, more physical activity, and less passive screen time may be protective for mental health.

A compelling body of work has integrated neurobiological factors into research on youth resilience during COVID-19. Youth with lower pre-pandemic heart rate variability (flexibility in autonomic nervous system responses) had a weaker link between COVID-19 related stress and emotional problems [28]. Temperament and neural factors are also implicated. Individual differences in shy/fearful temperament were related to divergent associations between neural responses to social reward and depressive symptoms during the pandemic [29]. Another study demonstrated that greater frequency/severity of stressors predicted greater depressive symptoms, but only for adolescents with greater

difficulty modulating neural responses to negative images before the pandemic [8]. This body of work suggests that psychological, behavioral, and neurobiological factors may all contribute to resilience during the pandemic.

Social resilience factors

Family support and parenting behaviors were likely protective against mental health difficulties during the pandemic. Parent support has been associated with lower depressive and anxiety symptoms [30] as well as better emotional well-being [31] during the pandemic. Improvement in adolescent–parent relationship quality during the pandemic was similarly related to better psychosocial functioning [32] and lower depressive symptoms [33]. Even among youth with elevated levels of mental health difficulties, better family functioning was related to lower mental health difficulties during the pandemic [34]. Other family factors are likely beneficial for youth’s mental health. For example, parents who worked at home were more likely to demonstrate increased parental warmth, which was associated with youth’s emotional well-being [35]. Parenting self-efficacy, even in the face of parent psychological distress, also appeared to be a protective factor for youth emotion regulation [36].

Support from peers and other important figures in youth’s lives may also have been potent protective factors for mental health during the pandemic. Support from peers [31], teachers [17], as well as therapists and mentors [37], have been linked to better youth mental health in the face of pandemic-related adversity. In addition, giving social support predicted less aggressive behavior in youth who were highly impacted by the pandemic [13]. A few studies have also examined protective associations with community and school-related factors. One study found that higher cohesion (closeness with other youths and caregivers) was associated with lower emotional distress among a sample of youths in residential care [38]. Similarly, school connectedness has been documented as a protective factor against pandemic-related increases in mental health problems [24,39]. Additionally, students who felt their concerns were being heard by their teachers and other adults at school had lower symptoms of anxiety and depression [30]. Interestingly, a better parent–teacher relationship was also related to lower youth mental health concerns [40].

Interventions to enhance resilience

Barriers to in-person interventions, including technological barriers, made high-quality interventions challenging for youth during the pandemic despite the high need. Mental health interventions during the pandemic typically ranged from one to 10 sessions and were mostly administered virtually in either a self-paced [41,42],

peer-led [43], or group-based manner [44]. However, at least one intervention was notably delivered in an in-person group setting [45]. Interventions often targeted psychological factors (e.g., mindfulness, growth mindset), behaviors (e.g., physical activity, behavioral activation), or perceived social support. Importantly, these interventions often targeted skills and resources that were helpful for coping with pandemic-related stressors (e.g., decreased social connection, increased physical health challenges) but were relevant to everyday life.

Two interventions were evaluated by randomized controlled trials [41,45] and others were evaluated by comparing non-randomized intervention and control groups. Interventions were typically associated with improvements in a range of mental health and well-being outcomes, including lower anxiety and depressive symptoms, and hopelessness [41]; higher emotional intelligence, self-rated health, life satisfaction, and agency [41,42,44]; and more traits that contribute to resilience (e.g., strength, optimism) [42,43]. Of note, mindfulness interventions were not consistently efficacious for improving psychosocial outcomes [42,45]. Discrepancies in findings could be due to differences in intervention administration (e.g., modality, dosage) and study design.

While most interventions were effective, feasibility and acceptability were not widely assessed. Previous research suggests that single-session interventions (SSIs) are generally brief, reliable, and accessible [46,47]. Furthermore, Schleider and colleagues [41] reported adequate acceptability of SSIs among youth during the COVID-19 pandemic. More intensive interventions, however, require more time commitment and may not be as feasible or accepted by youth. Some research suggests that interventions that have been shown to be effective in other contexts may be challenging to deliver remotely [48].

Future research directions

The current literature provides several targetable factors that may have promoted resilience in youth in the context of the pandemic. However, there are still many unanswered questions. First, more research is needed to understand which factors may have led to greater resilience in the face of pandemic-related stressors, particularly in youth who have been systemically excluded from research and may face higher rates of stressors (e.g., racially/ethnically minoritized, gender or sexual minority, youth with disabilities, youth living in poverty). It is especially important that interventions are developed and evaluated with diverse populations of youth and tested with randomized controlled trial study designs. Second, while many individual and family-related factors have been examined, there is a dearth

of research on factors that promoted resilience within schools and neighborhoods (e.g., school cohesion, neighborhood connection). It is also imperative that researchers assess which government-level supports improved youth mental health during the pandemic to inform future public health efforts. Lastly, more longitudinal work on youth mental health is needed to understand which factors may best promote positive adaptation and development long-term, as much of the literature is currently cross-sectional.

Conclusions

Consistent with the concept of “ordinary magic” [49], many youth during the COVID-19 pandemic have been able to draw on ordinary capabilities, relationships, and resources to protect their mental health during the pandemic. However, youth should not be expected to “be resilient” without support from caregivers and society. The aftermath of the pandemic provides an opportunity to harness the knowledge gained about resilience to improve mental health throughout adolescence and in the transition to adulthood during global public health emergencies.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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References

Papers of particular interest, published within the period of review, have been highlighted as:

- * of special interest
- ** of outstanding interest

1. Bitsko RH, Holbrook JR, Ghandour RM, Blumberg SJ, Visser SN, Perou R, Walkup JT: **Epidemiology and impact of health care provider–diagnosed anxiety and depression among US children.** *J. Dev. Behav. Pediatr. JDBP.* 2018, **39**:395.
2. Lu W: **Adolescent depression: national trends, risk factors, and healthcare disparities.** *Am J Health Behav* 2019, **43**: 181–194.
3. Jones SE, Ethier KA, Hertz M, DeGue S, Le VD, Thornton J, Lim C, Dittus PJ, Geda S: **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 Suppl* 2022, **71**:16.
4. Ravens-Sieberer U, Erhart M, Devine J, Gilbert M, Reiss F, Barkmann C, Siegel NA, Simon AM, Hurrelmann K, Schlack R: **Child and adolescent mental health during the COVID-19 pandemic: results of the three-wave longitudinal COPSY study.** *J Adolesc Health* 2022, **71**:570–578.
5. Scott SR, Rivera KM, Rushing E, Manczak EM, Rozek CS, Doom JR, Hate This” I: **A qualitative analysis of adolescents’ self-reported challenges during the COVID-19 pandemic.** *J Adolesc Health* 2021, **68**:262–269.
6. Hillis SD, Blenkinsop A, Villaveces A, Annor FB, Liburd L, Massetti GM, Demissie Z, Mercy JA, Nelson III CA, Cluver L: **COVID-19–associated orphanhood and caregiver death in the United States.** *Pediatrics* 2021, **148**.
7. Krause KH, Verlenden JV, Szucs LE, Swedo EA, Merlo CL, Niolon PH, Leroy ZC, Sims VM, Deng X, Lee S: **Disruptions to school and home life among high school students during the COVID-19 pandemic—adolescent behaviors and experiences survey, United States, January–June 2021.** *MMWR Suppl* 2022, **71**:28.
8. Gupta RS, Dickey L, Kujawa A: **Neural markers of emotion regulation difficulties moderate effects of COVID-19 stressors on adolescent depression.** *Depress Anxiety* 2022, **39**:515–523.
- ** Adolescents (14–17 years) with a previous clinical depression episode did not have increases in depressive symptoms during the pandemic (N = 28), though adolescents who had not had a depressive episode showed increases in depressive symptoms (N = 34). Increased pandemic-related stressful events predicted greater depressive symptoms but only for adolescents with difficulty with neural modulation of responses to negative images pre-pandemic, suggesting an underlying vulnerability to depression that may be activated by increased stress levels.
9. Breaux R, Dvorsky MR, Marsh NP, Green CD, Cash AR, Shroff DM, Buchen N, Langberg JM, Becker SP: **Prospective impact of COVID-19 on mental health functioning in adolescents with and without ADHD: protective role of emotion regulation abilities.** *JCPPP (J Child Psychol Psychiatry)* 2021, **62**:1132–1139.
10. İme Y, Ümmet D: **Adaptation of emotional flexibility scale: its association with subjective well being and resilience during COVID-19 Pandemic.** *Child Indic. Res.* 2022, **15**:2141–2154.
11. Wang Q, Zhao X, Yuan Y, Shi B: **The relationship between creativity and intrusive rumination among Chinese teenagers during the COVID-19 pandemic: emotional resilience as a moderator.** *Front Psychol* 2021, **11**, 601104.
12. Stein GL, Salcido V, Gomez Alvarado C: **Resilience in the time of COVID-19: familial processes, coping, and mental health in latinx adolescents.** *J Clin Child Adolesc Psychol* 2023:1–15.
13. Kuhlman KR, Antici E, Tan E, Tran M-L, Rodgers-Romero EL, Restrepo N: **Predictors of adolescent resilience during the COVID-19 pandemic in a community sample of hispanic and latinx youth: expressive suppression and social support.** *Res. Child Adolesc. Psychopathol.* 2023:1–13.
14. Kuhlman KR, Straka K, Mousavi Z, Tran M-L, Rodgers E: **Predictors of adolescent resilience during the COVID-19 pandemic: cognitive reappraisal and humor.** *J Adolesc Health* 2021, **69**:729–736.
15. Beames JR, Li SH, Newby JM, Maston K, Christensen H, Werner-Seidler A: **The upside: coping and psychological resilience in Australian adolescents during the COVID-19 pandemic, Child Adolesc. Psychiatry Ment. Health** 2021, **15**:77.
- * Adolescents (N = 760; 12–18 years) completed self-reports of resilience, positive experiences, and coping strategies during the COVID-19 pandemic. Results suggested that adolescents frequently reported positive experiences and engaged in active coping strategies. Furthermore, adolescents with higher levels of resilience exhibited lower levels of psychological distress.
16. Scheiner C, Seis C, Kleindienst N, Buerger A: **Psychopathology, protective factors, and COVID-19 among adolescents: a structural equation model.** *Int J Environ Res Publ Health* 2023, **20**:2493.
17. Zhu Q, Cheong Y, Wang C, Sun C: **The roles of resilience, peer relationship, teacher–student relationship on student mental health difficulties during COVID-19.** *Sch Psychol* 2022, **37**:62.

18. Tamari A, De la Barrera U, Schoeps K, Castro-Calvo J, Montoya-Castilla I: **Analyzing the role of resilience and life satisfaction as mediators of the impact of COVID-19 worries on mental health.** *J Community Psychol* 2023, **51**:234–250.
19. Hazlehurst MF, Muqueeth S, Wolf KL, Simmons C, Kroshus E, Tandon PS: **Park access and mental health among parents and children during the COVID-19 pandemic.** *BMC Publ Health* 2022, **22**:1–11.
20. Rosen ML, Rodman AM, Kasperek SW, Mayes M, Freeman MM, Lengua LJ, Meltzoff AN, McLaughlin KA: **Promoting youth mental health during the COVID-19 pandemic: a longitudinal study.** *PLoS One* 2021, **16**, e0255294.
Two-hundred twenty-four children (7-10 years) and adolescents (13-15 years) participated in this study at three timepoints: prior to the pandemic, during the stay-at-home orders, and six months after. The participants reported on pandemic-related stressors, internalizing and externalizing symptoms, and protective factors. Greater time in nature, less screen time, greater consumption of news media, getting adequate sleep, and having a structured routine were associated with reduced adolescent psychopathology.
21. Camerini A-L, Albanese E, Marciano L, Group CIR: **The impact of screen time and green time on mental health in children and adolescents during the COVID-19 pandemic.** *Comput. Hum. Behav. Rep.* 2022, **7**, 100204.
22. Jackson SB, Stevenson KT, Larson LR, Peterson MN, Seekamp E: **Outdoor activity participation improves adolescents' mental health and well-being during the COVID-19 pandemic.** *Int J Environ Res Publ Health* 2021, **18**:2506.
Adolescents (N = 624; 10-18 years) were surveyed in the first few months of the pandemic about changes in their subjective well-being and participation in outdoor activities since the beginning of the pandemic. Adolescents who participated in more outdoor activities (e.g., hiking, bicycling, skateboarding) reported smaller declines in subjective well-being.
23. Laurier C, Pascuzzo K, Beaulieu G: **Uncovering the personal and environmental factors associated with youth mental health during the COVID-19 pandemic: the pursuit of sports and physical activity as a protective factor.** *Traumatology* 2021, **27**:354.
24. Magson NR, Freeman JY, Rapee RM, Richardson CE, Oar EL, Fardouly J: **Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic.** *J Youth Adolesc* 2021, **50**:44–57.
25. Oliva S, Russo G, Gili R, Russo L, Di Mauro A, Spagnoli A, Alunni Fegatelli D, Romani M, Costa A, Veraldi S: **Risks and protective factors associated with mental health symptoms during COVID-19 home confinement in Italian children and adolescents: the# understandingkids study.** *Front. Pediatr.* 2021, **9**, 664702.
26. Liu SR, Davis EP, Palma AM, Sandman CA, Glynn LM: **The acute and persisting impact of COVID-19 on trajectories of adolescent depression: sex differences and social connectedness.** *J Affect Disord* 2022, **299**:246–255.
27. Rodman AM, Rosen ML, Kasperek SW, Mayes M, Lengua L, Meltzoff AN, McLaughlin KA: **Social experiences and youth psychopathology during the COVID-19 pandemic: a longitudinal study.** *Dev Psychopathol* 2022:1–13.
A total of 224 children (7-10 years) and adolescents (13-15 years) reported on their social behaviors, stressors, and both externalizing and internalizing psychopathology symptoms at three timepoints (prior to the pandemic, in the first few months during lockdown, and after lockdown). Adolescents who reported less social isolation and increased digital socialization during the pandemic exhibited lower risk for psychopathology following pandemic-related stressors.
28. Miller JG, Chahal R, Kirshenbaum JS, Ho TC, Gifuni AJ, Gotlib IH: **Heart rate variability moderates the effects of COVID-19-related stress and family adversity on emotional problems in adolescents: testing models of differential susceptibility and diathesis stress.** *Dev Psychopathol* 2022, **34**:1974–1985.
29. Sequeira SL, Silk JS, Hutchinson E, Jones NP, Ladouceur CD: **Neural responses to social reward predict depressive symptoms in adolescent girls during the CoViD-19 pandemic.** *J Pediatr Psychol* 2021, **46**:915–926.
30. Luthar SS, Pao LS, Kumar NL: **COVID-19 and resilience in schools: implications for practice and policy.** *Soc Pol Rep* 2021, **34**:1–65.
Middle schoolers and high schoolers (N = 14,603; 6th-12th grade) were surveyed in the first three months of the pandemic about their depressive and anxiety symptoms, resilience factors such as parental support, and whether their concerns were being heard in school. Students who reported high levels of parental support and that their concerns were heard and addressed by adults in school, reported lower depression and anxiety symptoms.
31. Wang M-T, Henry DA, Scanlon CL, Del Toro J, Voltin SE: **Adolescent psychosocial adjustment during COVID-19: an intensive longitudinal study.** *J Clin Child Adolesc Psychol* 2022: 1–16.
32. Martin-Storey A, Dirks M, Holfeld B, Dryburgh NS, Craig W: **Family relationship quality during the COVID-19 pandemic: the value of adolescent perceptions of change.** *J Adolesc* 2021, **93**:190–201.
33. Afriat M, De France K, Stack DM, Serbin LA, Hollenstein T: **Relationship quality and mental health implications for adolescents during the COVID-19 pandemic: a longitudinal study.** *J Child Fam Stud* 2023:1–11.
Across three timepoints from Fall 2019 to Fall 2020, adolescents (N = 163; 14-16 years) reported on their anxiety symptoms, depressive symptoms, perceived stress, emotion dysregulation, and relationship quality. An improvement in parent-adolescent relationship quality was associated with reductions in mental health difficulties. This relation was not present for increases in peer-adolescent relationship quality.
34. Penner F, Ortiz JH, Sharp C: **Change in youth mental health during the COVID-19 pandemic in a majority Hispanic/Latinx US sample.** *J Am Acad Child Adolesc Psychiatry* 2021, **60**: 513–523.
35. Wang M-T, Henry DA, Del Toro J, Scanlon CL, Schall JD: **COVID-19 employment status, dyadic family relationships, and child psychological well-being.** *J Adolesc Health* 2021, **69**:705–712.
36. Morelli M, Cattellino E, Baiocco R, Trumello C, Babore A, Candelori C, Chirumbolo A: **Parents and children during the COVID-19 lockdown: the influence of parenting distress and parenting self-efficacy on children's emotional well-being.** *Front Psychol* 2020, **11**, 584645.
37. Koper N, Creemers HE, van Dam L, Stams GJJ, Branje S: **Resilience, well-being and informal and formal support in multi-problem families during the Covid-19 pandemic.** *Child Adolesc Psychiatr Ment Health* 2022, **16**:1–14.
38. Costa M, Matos PM, Santos B, Carvalho H, Ferreira T, Mota CP: **We stick together! COVID-19 and psychological adjustment in youth residential care.** *Child Abuse Negl* 2022, **130**, 105370.
39. Hertz MF, Kilmer G, Verlenden J, Liddon N, Rasberry CN, Barrios LC, Ethier KA: **Adolescent mental health, connectedness, and mode of school instruction during COVID-19.** *J Adolesc Health* 2022, **70**:57–63.
40. Goodwin AK, Roberson AJ, Watson A, Chen GL, Long AC: **The impact of COVID-19, mental health distress, and school-based sociocultural protective factors among elementary-aged children and their caregivers.** *Sch Psychol Int* 2023, **44**:154–171.
Caregivers reported on their children's behavioral and emotional functioning as well as the parent-teacher relationship twice during the pandemic. Better parent-teacher relationships (e.g., parent-teacher affiliation and support, shared expectations and beliefs) were associated with lower mental health concerns for their children (N = 174; 4-14 years).
41. Schleider JL, Mullarkey MC, Fox KR, Dobias ML, Shroff A, Hart EA, Roulston CA: **A randomized trial of online single-session interventions for adolescent depression during COVID-19.** *Nat Human Behav* 2022, **6**:258–268.
Using a randomized controlled trial, the authors tested the effectiveness of two different online single-session interventions for adolescents (N = 2,452, 13-16 years) with high depressive symptoms during the COVID-19 pandemic. The intervention was associated with reduced hopelessness and increased agency as compared to controls. Single session intervention participation also predicted reduced depressive symptoms, hopelessness, and restrictive eating at three months post-intervention.

42. Yuan Y: **Mindfulness training on the resilience of adolescents under the COVID-19 epidemic: a latent growth curve analysis.** *Pers Individ Differ* 2021, **172**:110560.

In a quasi-experimental study, the authors examined whether mindfulness training for youth with low self-reported resilience predicted improved resilience and emotional intelligence in adolescents (N = 174; 12-14 years). The intervention was associated with increased resilience, but not emotional intelligence, from pre- to post-test. The control group participants did not exhibit changes in resilience or emotional intelligence. While the control group reported higher mean resilience score than the intervention group at baseline, both groups showed similar resilience scores at follow-up.

43. Glaser M, Green G, Zigdon A, Barak S, Joseph G, Marques A, Ng K, Erez-Shidlov I, Ofri L, Tesler R: **The effects of a physical activity online intervention program on resilience, perceived social support, psychological distress and concerns among at-risk youth during the COVID-19 pandemic.** *Children* 2022, **9**:1704.

The authors examined whether participating in an online mentoring health intervention could improve adolescents' psychosocial outcomes. Adolescents (N = 56; Mage = 16 years) who participated in the intervention reported increased social support and resilience traits and less psychological distress from pre- to post-test, but there were no significant differences in the control group.

44. Constantini K, Markus I, Epel N, Jakobovich R, Gepner Y, Lev-Ari S: **Continued participation of Israeli adolescents in online sports programs during the covid-19 pandemic is associated with higher resilience.** *Int J Environ Res Publ Health* 2021, **18**:4386.

The authors examined associations between adolescents' participation in online sports programs during the COVID-19 lockdown period and psychosocial outcomes. Adolescents (N = 473; 16-18 years) who participated in organized online sports programs reported higher

physical activity, self-rated health, life satisfaction, morale, and ability to cope compared to those who did not participate.

45. Dunning D, Ahmed S, Foulkes L, Griffin C, Griffiths K, Leung JT, Parker J, Pi-Sunyer BP, Sakhardande A, Bennett M: **The impact of mindfulness training in early adolescence on affective executive control, and on later mental health during the COVID-19 pandemic: a randomised controlled trial.** *BMJ Ment Health* 2022, **25**:110–116.

Using a randomized controlled trial, the authors tested whether an in-person group-based mindfulness training intervention could improve adolescents' mental health outcomes (N = 460; 11-16 years). Compared to psychoeducation, the mindfulness training group did not differ on mental health outcomes or affective executive control.

46. Schleider JL, Dobias M, Sung J, Mumper E, Mullarkey MC: **Acceptability and utility of an open-access, online single-session intervention platform for adolescent mental health.** *JMIR Ment. Health* 2020, **7**, e20513.

47. Schleider JL, Weisz JR: **Little treatments, promising effects? Meta-analysis of single-session interventions for youth psychiatric problems.** *J Am Acad Child Adolesc Psychiatry* 2017, **56**:107–115.

48. Gonsalves PP, Bhat B, Sharma R, Jambhale A, Chodankar B, Verma M, Hodgson E, Weiss HA, Leurent B, Cavanagh K: **Pilot randomised controlled trial of a remotely delivered online intervention for adolescent mental health problems in India: lessons learned about low acceptability and feasibility during the COVID-19 pandemic.** *BJPsych Open* 2023, **9**:e7.

49. Masten AS: **Ordinary magic: resilience processes in development.** *Am Psychol* 2001, **56**:227.