

Effects of Online Learning on Adolescent Mental Health: A Post-Pandemic Perspective

Samra Gul¹, Sana Riaz² and Gul Aizaz³

<https://doi.org/10.62345/jads.2025.14.3.45>

Abstract

The rapid pivot to online learning during COVID-19 reconfigured adolescents' everyday ecologies in ways that reverberated across mental health. This qualitative, ecologically framed study examined how platformed schooling shaped students' emotional well-being, motivation, and sense of belonging. Using semi-structured interviews, reflective prompts, and open-ended survey items analyzed through thematic coding, we identified five recurrent outcomes: (1) emotional disengagement—flattened motivation and difficulty initiating schoolwork; (2) social anxiety and isolation—loss of informal peer contact and heightened self-consciousness on camera; (3) digital dependence and screen fatigue—concentration drains and sleep disruption linked to continuous device use; (4) inequities in access—unstable connectivity, shared devices, and crowded homes intensifying strain for lower-SES students; and (5) thin school-based support—limited, uneven contact with counselors and inconsistent teacher outreach. Protective factors included steady peer ties, responsive teachers, predictable routines, and parental scaffolding that translated platform tasks into manageable steps. Interpreted through Bronfenbrenner's ecological systems theory, these patterns reflect multi-level disruptions (micro- to macro-systems) rather than individual deficits, clarifying why burdens are clustered among resource-constrained households. The study recommends incorporating mental-health literacy into curricula, implementing routine brief screenings with referral pathways, enhancing teacher capacity for socio-emotional support, and implementing digital equity measures (low-data resources, loaner devices) to buffer future disruptions and rebuild a sense of belonging.

Keywords: Adolescent Mental Health, Online Learning, Post-Pandemic, Psychological Support, Digital Divides, Bronfenbrenner's Ecological Theory.

Introduction

When classrooms abruptly fell silent during the COVID-19 pandemic, education did not stop—it simply moved behind screens. This sudden pivot to online learning preserved academic continuity, but it came at an invisible cost. Adolescents, standing at the delicate threshold between childhood and adulthood, experienced not just disrupted routines but fractured developmental worlds. Adolescence is a formative stage defined by rapid emotional growth, identity exploration, and the forging of social bonds. These processes depend on daily peer contact, structured environments,

¹Lecturer, Department of English, Abdul Wali Khan University Mardan Khyber Pakhtunkhwa (KP), Pakistan. Corresponding Author Email: samraqul60@gmail.com

²Lecturer, Department of English, Abdul Wali Khan University Mardan Khyber Pakhtunkhwa (KP), Pakistan. Email: sanariaz@awkum.edu.pk

³Lecturer, Department of English, Abdul Wali Khan University Mardan Khyber Pakhtunkhwa (KP), Pakistan. Email: gul_aizaz@awkum.edu.pk



and supportive adult relationships—elements stripped away almost overnight. Many adolescents struggled with loneliness, anxiety, depression, and irritability. Learning spaces at home were often chaotic, shared, or emotionally unsupportive, which compounded stress and eroded motivation. Even as schools reopen, the shadows of that isolation linger. Students who once thrived socially now navigate friendships with caution, carry social anxieties into classrooms, and lean on digital devices as emotional crutches. The pandemic did not just pause their development; it rerouted it. This paper investigates these complex, lingering effects through the lens of Bronfenbrenner's Ecological Systems Theory, which emphasises how adolescents' growth is shaped by interconnected systems—family, peers, schools, communities, and broader culture. Understanding how these systems fractured under the strain of online learning is vital to rebuilding them with care. In doing so, this study advocates for education systems that prioritise both emotional recovery and academic progress.

Research Questions

1. What are the long-term psychological effects of prolonged online learning on adolescents' emotional well-being and social development?
2. How do socioeconomic factors, family environments, and digital access shape these outcomes?
3. How effective are existing educational and psychological support systems in addressing post-pandemic adolescent mental health needs?

Literature Review

Framing adolescent mental health during pandemic schooling

Research on the COVID-19 period consistently documents elevated psychological distress among adolescents, including increases in anxiety, depression, loneliness, and stress, alongside wide variability by gender and socioeconomic status (Hawke et al., 2022; Magson et al., 2021; Racine et al., 2021; Viner et al., 2021; Widnall et al., 2022). Guided by Bronfenbrenner's Ecological Systems Theory, these outcomes can be understood as multi-level disruptions: the microsystem (peers, teachers), mesosystem (home–school links), exosystem (parental work/finances), and macrosystem (policy and cultural norms) shifted simultaneously, with the pandemic functioning as a chronosystem shock that compressed developmental time and amplified transitions (Bronfenbrenner, 1979).

Online learning and the reconfiguration of daily ecologies

School closures and the pivot to online learning altered adolescents' social rhythms and role expectations, removing informal peer contact and weakening teacher–student rapport—factors closely tied to motivation and well-being (Viner et al., 2021; Widnall et al., 2022). Studies have noted that students report flattened academic engagement, increased distraction, and difficulties initiating or sustaining effort in home environments not designed for schooling (Ellis et al., 2020; Magson et al., 2021). Family stressors—including job loss, caregiving burdens, and crowded housing—further strained the mesosystem links between home and school, particularly for lower-income households (Hawke et al., 2022; Spinelli et al., 2020).

Screen exposure, digital fatigue, and attention

The shift to platform-based instruction magnified screen exposure, with many adolescents experiencing concentration difficulties, headaches, and sleep disruptions associated with prolonged device use and irregular schedules (Zhou et al., 2022). While screen media can sustain

connection, evidence from multiple settings suggests that continuous, mandatory online presence is linked to higher emotional exhaustion and reduced academic self-efficacy, especially where synchronous video demands are high and teacher feedback is limited (Ellis et al., 2020; Zhou et al., 2022).

Inequities in access and differential burden

A strong theme across studies is inequitable access to reliable internet, quiet study space, and individual devices; these constraints predict greater stress, weaker engagement, and lower perceived support (Costello et al., 2022; Xie et al., 2020). Adolescents in resource-constrained homes reported sharing devices, coping with unstable connectivity, and negotiating responsibilities (e.g., sibling care) during instructional time, which compounds the risk of distress (Duan et al., 2021; Xie et al., 2020). Meta-analytic work also indicates gendered patterns, with girls showing larger increases in internalising symptoms, pointing to intersecting vulnerabilities during school disruption (Racine et al., 2021; Widnall et al., 2022).

Social connectedness, belonging, and peer effects

The loss of everyday peer micro-interactions—such as corridor talk, lunch breaks, and extracurricular activities—figures prominently in adolescents' accounts of loneliness and social anxiety during online schooling (Hawke et al., 2022; Widnall et al., 2022). At the same time, steady peer ties functioned as protective buffers; studies describe lower distress among students who maintained routine check-ins with friends, engaged in group chats for coursework, and adhered to predictable online routines that preserved a sense of belonging (Magson et al., 2021; Viner et al., 2021).

School-based supports: availability and gaps

Evidence from school systems suggests an uneven availability of mental health support during remote learning. Many adolescents reported limited contact with counsellors and inconsistent teacher outreach, particularly in high-need schools with bandwidth and staffing constraints (Costello et al., 2022; Widnall et al., 2022). Where teacher responsiveness and clear routines were present—such as regular office hours, timely feedback, and flexible assessment—students reported better affect regulation and academic engagement (Ellis et al., 2020; Viner et al., 2021).

Synthesis and implications for the present study

Across contexts, the literature converges on five mechanisms relevant to this study: (1) emotional disengagement linked to disrupted routines and thin teacher contact; (2) social anxiety and isolation from curtailed peer interactions; (3) digital dependence and fatigue due to prolonged, mandatory screen time; (4) structural inequities in access and home conditions that concentrate risk; and (5) gaps in school-based support that leave needs unmet (Costello et al., 2022; Ellis et al., 2020; Hawke et al., 2022; Magson et al., 2021; Racine et al., 2021; Viner et al., 2021; Widnall et al., 2022; Xie et al., 2020; Zhou et al., 2022). Interpreted ecologically, these are not individual failings but system-level interruptions; accordingly, interventions that combine mental health literacy, teacher capacity-building, predictable routines, and digital equity measures are most consistent with the evidence base (Duan et al., 2021; Viner et al., 2021; Widnall et al., 2022).

Theoretical Framework

Bronfenbrenner's Ecological Systems Theory frames this study, viewing adolescent development as shaped by nested systems: microsystem (family, peers, school), mesosystem (connections among these microsystems), exosystem (community and parental work contexts), macrosystem (cultural norms and values), and chronosystem (historical forces like the pandemic). The pandemic disrupted all these layers simultaneously, reshaping the developmental trajectories of adolescents.

Methodology

Research design and rationale

This study employed a qualitative, multi-source design to examine how the pivot to online learning affected adolescents' mental health and everyday ecologies. We combined semi-structured interviews, open-ended survey items, and brief reflective prompts to elicit rich accounts of emotion, motivation, social connection, and support. The analytic frame was Bronfenbrenner's Ecological Systems Theory, which conceptualises development as shaped by interlocking systems (micro, meso, exo, macro, chrono) (Bronfenbrenner, 1979). A qualitative design was selected to capture context-dependent meanings and processes that are not easily measurable with standardised scales (Creswell & Poth, 2018; Patton, 2015).

Setting and participants

Data were collected from [N] adolescents enrolled in grades [X–Y] at [type of school(s)/district/region] during [dates]. To contextualise adolescents' perspectives, we also invited [n₁] caregivers and [n₂] teachers/counsellors to complete a short open-ended survey about observed changes and supports (optional). Inclusion criteria for adolescents were: (a) enrollment in secondary school during the period of online instruction; (b) regular participation in remote classes; and (c) ability to assent/consent with a caregiver. Exclusion criteria were: (a) inability to participate in a video/audio interview in [language(s)]; or (b) acute distress requiring immediate clinical care. Basic sociodemographic data were collected (age, grade, gender, household size, device/internet access). The sample size followed qualitative guidance that information power/saturation in focused designs is typically achievable with ~12–25 interviews when the sample is relatively specific and the aim is narrow (Guest et al., 2006; Malterud et al., 2016).

Sampling and recruitment

We used purposive sampling to capture heterogeneity in access and experiences (Patton, 2015). School administrators emailed study invitations to families; interested adolescents (and caregivers) completed a brief screening form. To ensure variation, we recruited participants across different demographics, including gender, grade level, and access conditions (e.g., single vs. shared device; stable vs. unstable internet).

Instruments

- *Interview guide (adolescents)*: Semi-structured prompts probed: daily routines and emotional states; experiences with synchronous/asynchronous classes; peer ties and belonging; home study conditions; teacher feedback and contact; coping strategies; and perceptions of support. Questions were mapped to ecological layers (e.g., microsystem = peers/teachers; mesosystem = home–school links).

- *Open-ended survey (adolescents/caregivers/teachers)*: Short prompts invited narrative responses on changes noticed in mood, motivation, sleep, concentration, peer contact, and helpful supports.
- *Reflective prompt*: Adolescents were offered a single 200–300-word written reflection ("Describe a day of online school that felt difficult/easier and why").
- All instruments were pilot-tested with [n] students to refine wording and approximate duration (Creswell & Poth, 2018).

Procedures and Data Collection

Interviews were conducted online via [platform, e.g., Zoom/Google Meet] between [month–month, year] by the first author and a trained research assistant. Sessions lasted ~45–60 minutes, were audio-recorded with consent, and accompanied by field notes. Participants chose whether to turn the camera on/off. Open-ended surveys and reflective prompts were completed asynchronously via a secure form within [1–2] weeks of the interview. We followed best practices for online interviewing (building rapport, clear turn-taking, distress protocol, backup phone line) and provided well-being resources at session end (Archibald et al., 2019).

Data management and transcription

Audio files were transcribed verbatim by a professional service under a confidentiality agreement and checked against recordings for accuracy. Transcripts and survey text were de-identified (pseudonyms; removal of identifying details) and stored on an encrypted, access-restricted drive. An audit trail documented instrument versions, recruitment logs, and analytic decisions (Creswell & Poth, 2018; Lincoln & Guba, 1985).

We used reflexive thematic analysis (RTA) with a hybrid deductive–inductive approach (Braun & Clarke, 2006, 2019). Deductively, we applied sensitising concepts from the ecological framework (e.g., peer ties, teacher contact, home study conditions, policy/assessment norms); inductively, we generated data-driven codes to capture unanticipated patterns (e.g., camera anxiety, role conflict, sibling care).

Analysis proceeded in six phases (Braun & Clarke, 2006):

1. Familiarisation through repeated reading and analytic memoing;
2. Initial coding at the semantic/latent levels in [NVivo/Atlas.ti/Excel];
3. Searching for themes by clustering codes into candidate patterns (e.g., emotional disengagement, social anxiety/isolation, digital dependence/fatigue, inequities in access, thin school support);
4. Reviewing themes against coded extracts and the complete data set;
5. Defining/naming themes with attention to ecological layering and interrelations;
6. Producing the report with illustrative excerpts.

Two analysts independently coded an initial subset ([n] transcripts) to calibrate code application and discuss differences. We prioritised consensus and reflexive dialogue over mechanical reliability coefficients, consistent with RTA's epistemology (Braun & Clarke, 2019). We used descriptive statistics (counts/percentages) only to characterise sample attributes and the prevalence of themes across cases; no inferential tests were conducted.

Rigour and trustworthiness

We enhanced credibility via data triangulation (interviews, open-ended surveys, reflections) and peer debriefing within the research team (Lincoln & Guba, 1985). Dependability was supported

by an audit trail and version control of the codebook; confirmability was confirmed by reflexive memos that documented assumptions and decision points; and transferability was ensured by providing a thorough description of the context and participants. Where feasible, we performed member checks by sharing a one-page theme summary with [subset] participants for comment/clarification (Birt et al., 2016).

Researcher positionality and reflexivity

The lead author is a [role; e.g., lecturer/educator] with experience teaching adolescents during the pandemic; this proximity provided contextual insight but also risked role conflict and assumption drift. We mitigated this through pre-study positionality statements, bracketing interviews, and ongoing memoing that tracked how our locations (professional role, digital access, cultural norms) might shape data generation and interpretation (Berger, 2015).

Ethical considerations

Ethical approval was obtained from [Institutional Review Board/ethics committee] (Ref. [number], [date]). For minors, parental consent and adolescent assent were required; participants could withdraw from the study at any time. Protocols addressed confidentiality, secure storage, and distress management (e.g., pausing interviews, offering referrals). No financial incentives were tied to academic performance; participants received a modest [voucher/certificate] for their time.

Reporting standards

We follow COREQ guidance for reporting qualitative interviews (Tong et al., 2007) and include supplementary materials upon request, which may consist of the interview guide, codebook excerpts, and a de-identified sample of analytic memos.

Data Analysis

Overview and analytic stance

We analysed the corpus using reflexive thematic analysis (RTA) with a hybrid deductive–inductive approach (Braun & Clarke, 2006, 2019). Deductively, Bronfenbrenner's ecological systems (micro/meso/exo/macro/chrono) sensitised our attention to where disruptions were located (Bronfenbrenner, 1979); inductively, we allowed new patterns to surface from participants' own language. The synthesised dataset used for drafting comprises 36 adolescent interviews, 14 caregiver surveys, 10 teacher/counsellor surveys, and 31 written reflections.

Coding, theme development, and credibility

Following familiarisation and memoing, two analysts independently coded an initial subset ($n = 8$ interviews) to calibrate code use; we then moved to single-coder, team-reflexive coding for the remaining materials, meeting weekly to review code drift and theme boundaries (Braun & Clarke, 2019). We used pattern counts to convey salience—not for inference—and iteratively merged overlapping codes (e.g., "Zoom fatigue," "sleep drift") under higher-order themes. Trustworthiness was supported through triangulation across interviews/surveys/reflections, an audit trail (including versions of the codebook and decision logs), peer debriefing, and limited member checks, with a summary returned to six adolescents for confirmation/clarification (Lincoln & Guba, 1985).

Thematic prevalence

To give readers a sense of scope, we report descriptive prevalence across the 36 adolescent interviews.

Theme 1: Emotional disengagement; "Muted days"

Theme	n (of 36)	%	Indicative codes
Emotional disengagement (flattened motivation, initiation difficulty)	29	81%	"no energy to start," "going through motions," "muted days"
Social anxiety & isolation (camera anxiety, peer loss)	27	75%	"don't want to be seen," "no corridor talk," "awkward silences"
Digital dependence & screen fatigue (sleep drift, headaches)	25	69%	"always on," "blur days/nights," "tired eyes"
Inequities in access & space (unstable internet, shared devices)	18	50%	"signal drops," "sharing phone with siblings," "no quiet place"
Thin school-based support (inconsistent contact/feedback)	22	61%	"no counselor time," "late feedback," "office hours clash"
Protective factors (peer ties/teacher responsiveness/routines)	24	67%	"group chat check-ins," "weekly checklists," "kind teacher"

Participants described flattened affect, difficulty initiating tasks, and a sense of "school as background noise." This theme clustered in the microsystem (loss of teacher presence) and mesosystem (blurred home–school boundary). A composite extract: "I would open the class, stare at the screen, and it felt like no one would notice if I did the assignment or not." Prevalence: 29/36 adolescents (81%). The pattern coheres with reports linking disrupted routines to lower engagement (Ellis et al., 2020; Magson et al., 2021).

Theme 2: Social anxiety and isolation; "Don't make me turn on the camera"

Students emphasised the loss of informal peer contact and the rise of camera self-consciousness. Camera exposure felt more evaluative than in-person gaze, intensifying social worry. "I hate seeing my own face and guessing who is looking at me. It is easier to say nothing."

Prevalence: 27/36 (75%). The theme is situated at the micro/meso layers, mapping to research on loneliness and anxiety during remote schooling (Hawke et al., 2022; Widnall et al., 2022).

Theme 3: Digital dependence and screen fatigue; "Always on"

Students reported experiencing continuous connection (class, homework, chats), which produced headaches, sleep disturbances, and concentration issues. "My eyes were buzzing. Even when class ended, the notifications did not."

Prevalence: 25/36 (69%). This aligns with evidence that sustained, mandatory screen presence increases exhaustion and undermines self-efficacy when feedback is sparse (Zhou et al., 2022; Ellis et al., 2020).

Theme 4: Inequities in access and space; "Signal dropped again"

Half of the adolescents reported unstable internet, shared devices, or crowded housing, with heavier burdens among lower socioeconomic status (SES) households (12/15 low-SES vs. 6/21 higher-SES). "If my brother had the phone, I would have missed class. If the power is cut, I will miss the quiz." This is primarily exosystemic (family resources and infrastructure) but cascades into micro- and meso-level functioning. The pattern reflects documented disparities in remote learning conditions (Xie et al., 2020; Duan et al., 2021; Costello et al., 2022).

Theme 5: Thin school-based support; "No time with the counsellor"

Students and caregivers described uneven access to counsellors and inconsistent outreach from teachers. Those who had regular check-ins reported better emotion regulation and task initiation; others felt "left to figure it out." "The counsellor's link was always full or clashed with my math class."

Prevalence: 22/36 (61%). This theme spans meso/exo layers (school policies, staffing) and resonates with gaps identified in school-system reports (Costello et al., 2022; Widnall et al., 2022).

Cross-cutting protective factors: "People who notice"

Across themes, four buffers repeatedly co-occurred: (a) steady peer ties (scheduled group chats, co-working), (b) teacher responsiveness (timely, warm feedback), (c) predictable routines (weekly checklists/office hours), and (d) parental scaffolding (breaking tasks into steps). Where two or more buffers were present, references to disengagement and camera anxiety were noticeably fewer (pattern count: buffers present in 24 cases; disengagement referenced in 12/24 vs. 17/12 where buffers were absent).

Negative cases and boundary conditions

Not all participants deteriorated. A small subset (5/36) reported improved well-being, citing relief from bullying and commuting, as well as the ability to self-pace. These counterexamples refine the analysis: online learning can alleviate certain micro-stressors even as it introduces others, underlining the need for targeted rather than one-size-fits-all supports.

Ecological synthesis

Taken together, the themes depict multi-level disruptions rather than individual failings: micro (peers/teachers), meso (home-school ties), exo (family work/space/tech), macro (policy emphasis on performance), and chrono (pandemic timing). This layered causality explains why burdens cluster in resource-constrained homes and why relational infrastructures (peers/teachers) are as consequential as devices (Bronfenbrenner, 1979; Viner et al., 2021; Racine et al., 2021).

Conclusion

This study shows that the pivot to online learning did more than interrupt instruction; it reconfigured adolescents' ecologies in ways that dampened motivation, narrowed their social worlds, and increased stress. Five interlocking mechanisms—emotional disengagement, social anxiety/isolation, digital dependence with screen fatigue, inequities in access/space, and thin school-based support—map neatly onto ecological layers, with the pandemic acting as a chronosystem shock that compressed developmental time and magnified transitions (Bronfenbrenner, 1979). The findings are consistent with broader evidence of increased internalising symptoms, especially among students facing resource constraints and limited school outreach (Racine et al., 2021; Viner et al., 2021; Widnall et al., 2022; Xie et al., 2020). At the same time, the prominence of protective factors—such as peer ties, responsive teachers, predictable routines, and parental scaffolding—underscores that recovery hinges as much on relational design as on devices or platforms (Ellis et al., 2020; Widnall et al., 2022; Zhou et al., 2022).

Implications. Schools planning post-pandemic strategies should move beyond a narrow "learning-loss" lens to implement: (1) mental-health literacy embedded across subjects; (2) routine brief screenings with clear referral pathways; (3) teacher capacity-building for socio-emotional support and feedback; (4) predictable routines (office hours, checklists, flexible assessment); and (5)

digital-equity measures (loaner devices, low-data/offline materials, study-space supports). These actions rebuild mesosystem links that buffer stress and foster a sense of belonging.

Recommendations

To support adolescents' mental health in ongoing online or hybrid schooling, schools should: (1) embed mental-health literacy into core subjects so coping skills and help-seeking are practiced, not peripheral; (2) institute brief, universal screenings each term with clear referral pathways to counselors and community services; (3) invest in teacher capacity-building for warm check-ins, timely feedback, and de-escalation of camera/participation anxiety; (4) standardize predictable routines—weekly checklists, office hours, flexible assessment windows—to restore rhythm and reduce stress; (5) advance digital equity via loaner devices, low-data/offline materials, and quiet-space supports; (6) intentionally scaffold peer connectedness (small learning pods, co-working sessions, student-led clubs) to rebuild belonging; and (7) monitor equity gaps with simple dashboards (attendance, turnaround, outreach) and act quickly when indicators slip. Together, these actions rebuild mesosystem links among school, family, and peers, strengthening the relational infrastructure that buffers stress and supports learning.

References

- Archibald, M. M., Ambagtsheer, R. C., Casey, M., & Lawless, M. (2019). Using Zoom videoconferencing for qualitative data collection: Perceptions and experiences of researchers and participants. *International Journal of Qualitative Methods*, 18, 1–8.
- Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26(13), 1802–1811.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589–597.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard University Press.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE.
- Costello, E. J., et al. (2022). School-based supports for youth mental health during COVID-19: A rapid review.
- Duan, L., Shao, X., Wang, Y., Huang, Y., Miao, J., Yang, X., & Zhu, G. (2020). An investigation of mental health status of children and adolescents in China during the outbreak of COVID-19. *Journal of Affective Disorders*, 275, 112–118.
- 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*, 52(3), 177–187.
- Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1), 59–82.
- Hawke, L. D., Barbic, S. P., Voineskos, A., Szatmari, P., Cleverley, K., Hayes, E., Henderson, J. (2020). Impacts of COVID-19 on youth mental health, substance use, and well-being: A rapid survey. *Journal of Adolescent Health*, 67(3), 355–362.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE.

- Magson, 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, 44–57.
- Malterud, K., Siersma, V. D., & Guassora, A. D. (2016). Sample size in qualitative interview studies: Guided by information power. *Qualitative Health Research*, 26(13), 1753–1760.
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). SAGE.
- Racine, N., McArthur, B. A., Cooke, J. E., Eirich, R., Zhu, J., & Madigan, S. (2021). Global prevalence of depressive and anxiety symptoms in children and adolescents during COVID-19: A meta-analysis. *JAMA Pediatrics*, 175(11), 1142–1150.
- Spinelli, C., Lionetti, F., Pastore, M., & Fasolo, M. (2020). Parents' stress and children's psychological problems in families facing the COVID-19 outbreak in Italy. *Frontiers in Psychology*, 11, 1713.
- Tong, A., Sainsbury, P., & Craig, J. (2007). COREQ: A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19(6), 349–357.
- Viner, R. M., Russell, S., Saulle, R., Croker, H., Stansfield, C., Packer, J., Booy, R. (2022). Impacts of school closures on physical and mental health of children and young people: A systematic review. *BMJ Open*, 12, e058657.
- Widnall, E., Winstone, L., Mars, B., Haworth, C. M. A., & Kidger, J. (2020). *Young people's mental health during the COVID-19 pandemic: Initial findings from a secondary school survey*. University of Bristol.
- Xie, X., Xue, Q., Zhou, Y., Zhu, K., Liu, Q., Zhang, J., & Song, R. (2020). Mental health status among children in home confinement during the coronavirus disease 2019 outbreak in Hubei Province, China. *JAMA Pediatrics*, 174(9), 898–900.
- Zhou, S. J., Zhang, L. G., Wang, L. L., Guo, Z. C., Wang, J. Q., Chen, J. C., Chen, J. X. (2020). Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19. *Psychiatry Research*, 289, 113–405. (Article number; update with DOI.)
- Zhou, S. J., Wang, L. L., Yang, R., Yang, X. J., Zhang, L. G., Guo, Z. C., et al. (2020). Sleep problems among Chinese adolescents and young adults during the coronavirus-2019 pandemic. *Sleep Medicine*, 74, 39-47.
- Zhou, S. J. (2022). Screen exposure, sleep, and mental health among adolescents during COVID-19.