Child and adolescent mental health and the digital world: A double-edged sword

Rachana Desai[i] and Patrick Burton[ii]

The fourth industrial revolution has increasingly blurred the boundaries between the physical and digital worlds, leading to dramatic shifts in daily life and changing the way children and adolescents live, socialise, move around and learn.[1] Never before has this been so evident than at the onset of the COVID-19 outbreak and the subsequent unprecedented exponential rise in technology and internet use.[2] Global estimates suggest that one in three internet users is a child and that the proportion of child internet users is likely to be higher in developing countries.[3]

Digital technology, especially social media use, has provided access to information, social connection, education, online support groups and professional help. There is also increasing public debate and concern that digital technologies may influence a child's ability to interact with others in 'real life' and that too much time spent on social media may contribute to mental health problems such as depression, self-harm and suicide. There are substantial research gaps in understanding the possible benefits and harms of the evolving digital world. To contribute to the collective understanding of the experiences and consequences of growing up in a digital world, this chapter aims to bring together diverse perspectives and interrogate the impact of digital worlds on children's mental health and to provide recommendations for policy and practice.

How do South Africa's children use digital technology?

South Africa has approximately 38 million internet users (1.5 million households).[4] Children most often go online on smartphones, using mobile data at home, and the level of online engagement increases with age.[5] Home computer and tablet access at home is relatively rare in lower socio-economic contexts.[3, 6] Cell phone plans in South Africa also provide free or cheaper access to social media platforms, resulting in social media use being much more prevalent than any other online activity, driving the content that children engage with online. For children, access is not only mediated by device and cost, but also by parents, who play the greatest role in determining when, how and where their children can use devices and connect to the internet.

Through the COVID-19 pandemic, access to reliable internet access became even more important, as teaching, connection with friends, play, and access to support services increasingly moved online. While significant progress may have been made to extend internet access to under-served areas prior to the COVID-19 pandemic,[7, 8] children across the country did not have equitable access to the internet during the lockdown periods. Socio-economic barriers to accessing the internet prior to the pandemic, which included the high cost of mobile data, the price of devices, and poor signal, were exacerbated during the COVID-19 lockdowns, deepening existing social and digital inequalities or the 'digital divide'.[9]

Globally, regional differences in internet access during the lockdowns associated with the COVID-19 pandemic were also found, with only 20% of children in Africa being able to access the internet often and very often compared to 86% of children in Eastern Europe.[10] A generational digital divide is also evident in digital skills and knowledge between parents and children. One in two children report being better internet users than their parents in South Africa.[6] Parents may have limited knowledge of the risks and opportunities that the digital world may offer, which in turn may prevent parents from appropriately intervening and guiding their child's online activities in line with their evolving capacities.[8, 11]

How does the digital environment impact on child and adolescent mental health?

Understanding the impact of the digital environment on children's mental health requires a balanced consideration of the risks, opportunities, and full range of children's rights in a digital world. Using a child-centred approach developed by EU Kids Online,[12] online risks and opportunities can be classified according to four criteria, as outlined in Figure 25.

While access to and affordability of reliable high-speed

i DSI/NRF Centre of Excellence in Human Development, Faculty of Health Sciences, University of Witwatersrand, Johannesburg, South Africa
ii Centre for Justice and Crime Prevention

Figure 25: Classification of online risks and opportunities

Content: The child is a recipient of digital content that is either mass-produced or user-generated (including by the child), which may or may not be shared widely.	**Contact:** The child is a participant of an interactive encounter.	**Conduct:** The child as actor in a peer-to-peer exchange.	**Contract:** The child is an active participant in the digital market. This can be mediated by the automated (algorithmic) processing of data.
Content risks include: Violent, hateful or pornographic content that may be illegal and age inappropriate. Receiving misleading information or "fake news", advertising and spam.	**Contact risks include:** The child experiences or is targeted by contact in a adult-initiated interaction resulting in harms, harassment (including sexual), stalking, hateful behaviour, sexual grooming⁺ and sextortion.	**Conduct risks include:** Bullying, hateful peer activity, trolling*, sexual messages, pressures or harassment, participation in potentially harmful user communities (e.g., self-harm or eating disorders).	**Contract risks include:** Digital fraud, identity theft and age-inappropriate marketing messages.
Content opportunities include Seeking out educational material, mental health information and support e.g. resources from the South African Depression and Anxiety Group (SADAG).	**Contact opportunities include** Digital health interventions such as computerised cognitive behavioural therapy (CBT) for depression and anxiety for adolescents[14], and access to digital playgrounds that mimic offline play[15].	**Conduct opportunities include** Fostering a sense of social inclusion and connection. Children enjoy, express themselves, develop, learn, and participate in the digital world.	**Contract opportunities include** Social media uses search words such as 'suicide' and 'depression' to access contact details of local organisations that provide critical mental health resources.

Notes: ⁺ Tactics abusers deploy through the internet to sexually exploit children *To instigate conflict, hostility, or arguments in an online social community.
Adapted from: Livingstone S, Stoilova M. The 4Cs: *Classifying Online Risk to Children*. 2021.

internet remains a challenge for large sections of South African society, the digital environment can offer significant opportunities for enhancing child health and well-being through the provision of psychosocial support, mental health services and information to children, particularly where few physical resources or services are available, or where children may feel threatened or otherwise uncomfortable seeking physical services or consulting offline sources of information.[13]

Yet, children in the digital world are also exposed to a range of threats to their emotional, physical or mental well-being. The degree of potential harm depends on:

- The nature and severity of the online risk
- The design, regulation and management of the digital environment (privacy settings, moderation services[iii] and access to mental health support)
- Offline risk and protective factors (including the child's age, gender, digital skills, resilience, personality, socio-economic situation)
- Family relationships (harsh discipline, neglect, parent-child conflict, positive parent-child relationships),
- School environment (poor teacher and peer relationships, bullying) and
- Community context (exposure to violence, lack of green spaces for play)

It is therefore useful to consider how to foster the (digital) resilience of children so that they understand what risks they are likely to encounter at different ages and know when they are at risk, what to do when they encounter risks, how to seek help, and how to recover – and learn – from adverse experiences.

How can a child rights approach be used to strike the optimal balance between children's rights to protection and participation?

Much of the initial focus of legislation and policy within South Africa has been focused on protecting children from exposure to online risks and harms, often at the expense of participation and privacy.

Yet, the United Nations Committee on the Rights of the Child's General Comment No. 25, issued in 2021, provides

iii Moderation services refers to the reviewing, filtering and monitoring of user-generated content online, often undertaken by the organizations or companies on whose platforms the content is posted.

substantive guidance to states and other duty bearers on what the digital environment means for children's civil rights and freedoms, and their rights to privacy, non-discrimination, protection, education, play and more. It also explains why and how states should give effect to children's rights in the digital environment.[16]

Notably, the Committee conducted consultations with children around the globe who expressed their lived experiences, opinions and hopes for a safer and more inclusive digital world. In acknowledging the important role of children's participation, the General Comment begins by sharing some of the children's views:

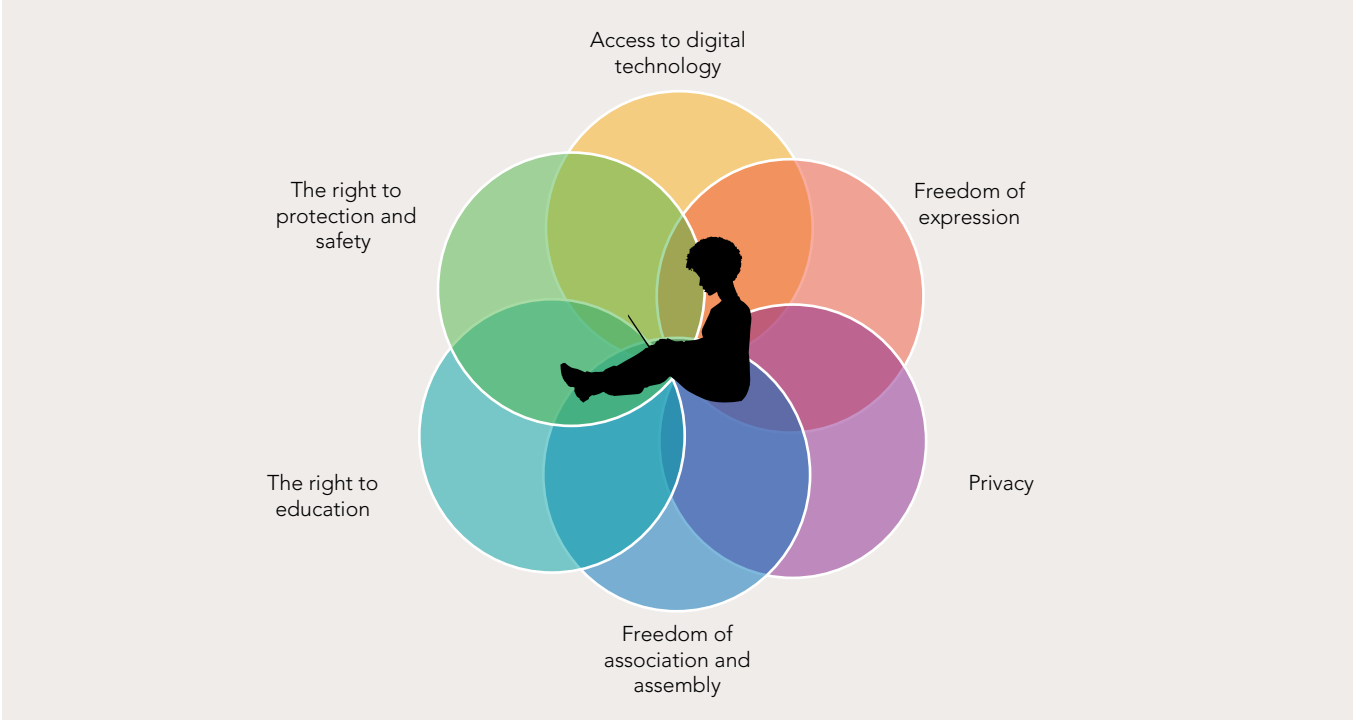
Children in diverse contexts see digital technology as critical to their current lives, and the future. They find benefits in using digital technology: "By the means of digital technology, we can get information from all around the world"; "When you are sad, the internet can help you see something that brings you joy". Children also called for action to support, promote and protect their safe engagement with these technologies: "I would like the government, technology companies and teachers to help us manage untrustworthy information online"; "I would like to obtain clarity about what really happens with my data … Why collect it? How is it being collected?"[16(p.1)]

The General Comment then identifies six principles that should inform state-led efforts to respect, protect and fulfil the rights of the child in the digital environment as outlined in Figure 26:

In addition, the following rights should be applied to all stages of the policy, implementation and intervention development process:

- *Best interests of the child*
  Legislation and policies should not focus on the protection and safeguarding of children in a way that undermines or restricts children's other rights within the digital environment – such as their rights to privacy, information and participation.
- *Evolving capacities*
  Laws, policies and interventions should adopt a more active and empowering approach that recognises how children's need for protection diminishes and their capacity to take responsibility for decisions affecting their lives grows across the life course.
- *Non-discrimination*
  Interventions and policy guidelines should be attuned to the diverse experiences of children which affect their access to, and experience of, digital technology and take care that the measures introduced do not exclude or discriminate against particular groups of children, such as children living with disabilities or those who do not have access to the internet.[17]
- *Child participation*
  Children have a right to be heard on matters that affect them and children's participation is essential to ensure that policies and programmes are attuned and responsive

Figure 26: Six principles that should guide the realisation of children's rights in the digital environment



to children's needs. Policies and programmes should also foreground and foster children's own agency, but without placing an undue burden on children for their own safety and well-being.

What are the opportunities to strengthen policy and practice?

Realising the potential of digital technology to enhance children's mental health and well-being requires a whole-of-society approach and will require interventions to transform both policy and practice.

Legislation and policy

Children's access to digital technology and their digital literacy and skills impact on their safety online, their ability to successfully navigate risks, manage and balance healthy digital technology use, and bounce back from adversity.[18] Therefore, policies at a national and provincial level should explicitly focus on prioritising universal broadband access and accompany this with obligatory training and skills development for children, educators, parents and caregivers.

While there is not yet a substantive body of evidence from South Africa on the interaction of online and offline risk, there is sufficient global evidence and evidence-informed guidance[16, 19] to justify the integration of children's online protection, including the addressing of online risks to children's mental health and well-being, as a substantive aspect of policies and legislation addressing violence against children. Therefore, all policies and legislation relating to the provision of digital technology and services, and to the prevention of violence and promotion of safety, should explicitly integrate steps to ensure the safety and well-being of children online.

Steps taken should be integrated into the regulatory framework of all digital technology services that children may encounter. The White Paper on Audio and Audio-visual Content Services, for example, provides a framework to protect children from harmful and exploitative marketing practices by commercial enterprises. This policy approach could be strengthened by placing further obligations on industry to ensure that products and services take into account the fact that children may access services not directly intended for use by children. This could include the introduction of mandatory Child Rights Impact Assessments on all digital services, the implementation of an Age-Appropriate Design Code,[iv] and strengthening reporting and accountability mechanisms to ensure that swift action is taken to address user complaints and remove inappropriate content.

Educational institutions

Schools offer a critical platform for intervention and engagement with teachers, learners and the wider school community. School policies, regulations and guidelines should aim to balance the protection of children with their rights to privacy and to use technology in a way that is appropriate to their age and evolving capacities.[v] Such policies should promote positive use of digital technologies, while taking steps to restrict access to harmful content.[16]

The Department of Basic Education has revised its Guidelines on E-safety in schools, which is intended as a framework and resource for schools, governing bodies and parents.[20] However, these guidelines, even in their revised form, are dated, and fail to integrate more recent evidence on children's use of technology, the critical issues and challenges facing schools and children, and emerging best practice on how to address these challenges. This includes the failure to address data protection and management which may result in harmful outcomes – mental and physical – to learners, particularly as schools adopt EdTech and various forms of e-learning and school-parent communication platforms. There is similarly no uniform integration of online safety and digital well-being into the formal curriculum, although there is emerging good-practice available from interventions offered by NGOs as outlined in Case 22.

In their efforts to keep children safe, schools may inadvertently collect or utilise data in ways that may pose a risk to children's mental health and well-being.[21] For example, digital technology intended to aid communication with parents and children may lead to direct harm if children are identified and their behaviour discussed in a public forum (an unintentional 'shaming' exercise). Similarly, as learning has gone online, the systems that schools use may expose children to risks through unregulated data collection by education technology companies. Institutional policies are thus required to manage the use of digital technologies and social media in a way that promotes their utility and opportunities while safeguarding and protecting children.

Interventions aimed at developing cognitive functioning and socio-emotional learning skills of younger children, including

iv See for example, https://5rightsfoundation.com/our-work/design-of-service/age-appropriate-design-code.html.

v While it is recognised that schools and other institutions function in very different contexts, and have variable access to resources (including in some instances having limited or no access to digital technology), a model set of guidelines and policies are important to ensure that those schools who are well-connected implement the most appropriate policies, and that as more schools are connected and introduce digital technology, they adopt and implement evidence-based policies and guidelines from the outset.

early childhood development programmes, should consider integrating digital literacy. This ranges from the inclusion of material targeting parents and caregivers on age-appropriate internet and device access and usage, to digital literacy programming for parents and caregivers themselves.

Training for educators is also needed so that they are able to identify children who exhibit symptoms of trauma or distress as a result of online harm and can refer them to psychosocial support services. This should be incorporated into broader care and support for teachers and learners programming, rather than being seen as a distinct symptomology.

Health care services

Digital technology has the potential to expand access to much needed psychosocial support and mental health services for children in South Africa. This includes digital mental health services from the state as well as psychosocial support and trauma counselling from non-governmental organisations (NGOs) and civil society.

These investments are particularly pressing given the treatment gap for children in South Africa, as they have the potential to extend the reach of specialist child and adolescent mental services which remain extremely limited

Case 22: Web Rangers – Building the digital literacy skills of South Africa's children

Phakamile Khumalo and William Bird[i]

The Web Rangers programme is led by Media Monitoring Africa (MMA) and partners[ii] in South Africa and aims to empower children (aged 12 – 17 years old) with digital and media literacy skills so they can become active digital citizens. This means having the tools and skills to use the internet, social media and other digital tools in a responsible and ethical way.

Since 2016, the programme has trained over 1,300 children using MMA's Web Rangers curriculum.[23] Once trained, Web Rangers are tasked with creating innovative online safety videos that promote active digital citizenry within their schools and communities. They also host online safety webinars, school presentations and engage in high-level information and communications technology (ICT) related policy discussions and submissions to ensure that children's voices are heard, and their participation prioritised.

The programme uses a child rights approach and combines training, advocacy work and policy engagement opportunities to challenge the mindset that children are just vulnerable victims with little or no agency. For example, key highlights include the Web Rangers representing South Africa at the 2019 Internet Governance Forum in Berlin, and creating the first ever South African comic book educating children about misinformation and disinformation[24].

Tumelo, a 2017 Web Ranger ambassador, tells a beautiful story of the impact of the programme:

> *"The Web Rangers is unique because the education system does not teach this or parents at home. There are reported suicides, molestation, human trafficking that happens through social media and it happens at a high rate because children are not responsible and that's where the Web Rangers fit, to educate and shape our view on social media. I do not reply to a lot of messages from strangers. I avoid negative comments even on my posts because I know people are angry with themselves and they try to make everyone angry as well so they can feel better. Unfortunately for them, I am a Web Ranger, and it has made me a hard nut to crack. I do not succumb to the social media world of being reckless."*

This is one of many powerful quotes from programme participants that illustrate how becoming an active digital citizen helps challenge children's violent online behaviour patterns, offers them ways to manage conflict, build core skills and resilience, and helps strengthen children's mental health.

A systematic review of the impact of digital skills training for young people in the United Kingdom[25] confirms the positive link between digital literacy and mental health. The research found that digitally skilled children aged 12 – 17 years experienced less distress after facing online harm.

This by no means makes Web Rangers immune from potential harm online, but they are equipped with the tools and resources to take advantage of new opportunities that technology and the internet offers, and they have the knowledge and skills to successfully navigate the challenges they encounter online.

i Media Monitoring Africa

ii Web Ranger partners include Google, Meta, TikTok, Department of Communications and Digital Technologies, the Film and Publications Board, Walt Disney and Dentons.

Case 23: Human-centred design of apps to support adolescent mental health

Alastair van Heerden[i]

The phenomenal growth of mobile technologies over the past 15 years has stimulated innovation and the development of digital interventions to support child and adolescent mental health. Understanding the needs, wants and limitations of end users is a critical component of any human-centred design (HCD) process. Key elements of HCD include:

- Developing personas or fictional characters based on research and data that describe the generic types of people involved in or benefiting from a digital intervention. The persona is then used to help the project team understand the needs and motivations of the target user.
- Using cards to help visualise the journeys or the sequence of steps that users take to complete a task or use the service.
- Convening co-design workshops to bring the intended users into the design process and build trust. It is a more creative approach to public engagement that allows people to work together to explore the design of digital solutions.[26]

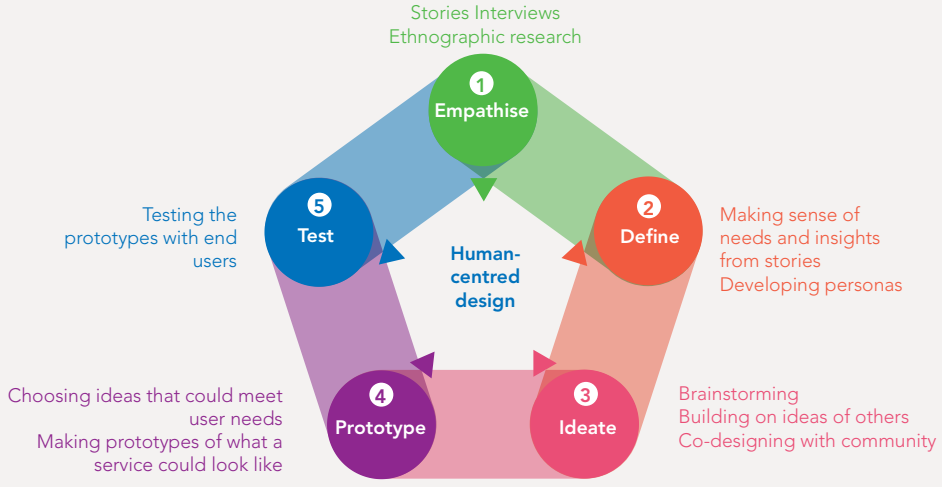
An example of how these principals lead to very different real-world outcomes can be seen in a recent set of apps designed to support adolescent mental health – the STARS[27] and step-by-step[28] apps.

Sustainable Technology for Adolescents and youth to Reduce Stress (STARS) used an HCD process to design a digital mental health intervention for adolescents. The intervention was created through an iterative cycle of idea creation, prototype development and feedback from adolescents. The end product was not pre-determined, but rather allowed to evolve through the design process. The final product was a chatbot intervention delivering transdiagnostic cognitive behavioural therapy content to adolescents aged 15 – 18 years. The intervention was designed to be adaptable across different settings, including low- and middle-income countries (LMICs).

The Step-by-Step study had a similar goal to design a digital mental health intervention that could be rolled out to adolescents in LMICs. The design process began by engaging key stakeholders and experts and included formative qualitative work with populations in Lebanon. These consultations provided important information that went on to inform the development of the content, the guidance model and the delivery system (e.g., app or website). The result was an illustrated narrative game that used animated characters to provide psychoeducation and training in behavioural activation therapy. The characters and story are provided in four "flavours", with users selecting the one they preferred (e.g. a man with or without a beard).

While both had the same goal, using an HCD process resulted in two very different digital health tools. Often described as contextual adaptation, the co-design of digital tools using HCD principles ensures that the end product is fit for purpose and relevant to the culture and context in which it will be used, thereby maximising the likelihood of success. A library of mental health apps is available at the following link: https://mindapps.org/Apps.

Figure 27: Key components of a human-centred design process



i Human and Social Development Programme, Human Sciences Research Council

Case 24: The potential to use digital technologies to reduce youth suicide risk

Jason Bantjes[i]

Improving access to effective, age-appropriate, and acceptable psychological treatments for common mental disorders is integral to youth suicide prevention in South Africa. However, this is not as simple as it sounds because of the large number of adolescents who require psychological support and because of the shortage of mental health professionals and the lack of accessible adolescent psychiatric services in the public health care system. Digital technologies could be one cost-effective way to scale-up interventions and improve access to adolescent mental health care in South Africa. Indeed, there are effective digital interventions for most common mental disorders[29-32] and young people in particular seem to be open to using technology to access psychological support.[33]

A recent pragmatic trial of an online group intervention for South African university students with depression and anxiety is an apt example of how technology could be utilised to scale up treatment on university campuses.[34] This intervention was developed as part of the ongoing work of the WHO World Mental Health Surveys International College Student initiative to develop scalable and effective interventions to promote the well-being of university students globally.[34]

The intervention, which is based on cognitive behavioural therapy (CBT), was delivered remotely to groups of 8 – 12 students via a video conferencing platform in weekly one-hour workshops over 10 weeks. The groups were facilitated by registered counsellors and psychology masters students, under supervision of a psychologist. The content was organised into five themes with each theme spanning two workshops. Themes included problem solving, recognising emotional triggers, identifying unhelpful thoughts, emotional regulation skills, behaviour activation, and stress management.

The intervention materials were developed in consultation with students, who gave advice about the format, exercises and examples used in the intervention. Participants were provided with electronic interactive PDF workbooks consisting of exercises and brief summaries of the main ideas and skills for each session. Students were also invited to use the web-based chat function to type comments, questions, or responses during the sessions if they felt uncomfortable speaking in the group. Strategies used to improve retention included giving participants permission to miss sessions but encouraging attendance at each new session, sending follow-up emails to students who missed sessions prompting them to join the following week, and giving a brief recap of the previous workshop at the start of each new session.

In 2020, during the covid pandemic, 175 students were enrolled in the intervention, 90% of whom initiated treatment. The level of engagement was good with most students attending sessions regularly, and with very low attrition rates. Crucially, students who participated in the intervention showed significant reductions in symptoms of depression and anxiety. Remission rates among participants with clinically significant baseline symptoms were 68%-79% and were not associated with baseline symptom severity.

Students reported high levels of satisfaction with the online intervention. Most of the participants rated intervention quality as good or excellent (91%), were satisfied with the kind (86%) and amount (86%) of help received and reported being better able to deal effectively with their problems following the intervention (90%). These high rates of satisfaction with treatment support the idea that digital interventions may be appealing to some university students and could be integrated into existing student counselling services.

It remains to be seen if the good outcomes observed in the initial pragmatic trial will also be seen in well controlled clinical trials and if the reductions observed in symptoms of depression and anxiety will translate into lower rates of fatal and non-fatal suicidal behaviour. Nonetheless, the pragmatic trial conducted in 2020 serves as a proof of concept for the use of web-based group CBT to promote the mental health of university students in South Africa. The intervention is currently being tested in a randomised control trial in South Africa.

i Alcohol, Tobacco and Other Drug Research Unit, South African Medical Research Council; and the Institute for Life Course Health Research, Department of Global Health, Stellenbosch University.

and concentrated in a handful of urban centres. For example, a digital clinical decision support system that was developed in India enables general practitioners working in primary care settings to access supervision and guides them through the assessment and management of children and adolescents with mental disorders.[54]

There is also growing evidence of how digital platforms can be used effectively to provide therapeutic programmes to children and young people, including an online intervention for South African university students that has shown promise in alleviating symptoms of depression and anxiety (Case 24). Key to successful programming is the adoption of human-centred design principles which actively engage with children and young people in the design and co-creation of digital solutions (Case 23). Strict data control and security measures also need to be put in place to limit and safeguard the data collected to ensure that this poses no inadvertent risks to children.

Building capacity and transforming practice

What happens online is a broader reflection of societal and community attitudes and behaviours. Just as schools are microcosms of communities, so the online space reflects values, attitudes and norms that are espoused in the offline space. While specific intervention and programming areas are required, these should be framed within a broader approach to modelling appropriate behaviours and attitudes. This ranges from the modelling of healthy digital habits by adults, including the management of time spent on devices within family or social contexts, to the language and behaviours that adults, including parents and caregivers, engage in themselves online, and the tolerance or intolerance towards unacceptable behaviour and language both on- and offline.

Support to parents and caregivers on parenting practices within a digital world should be prioritised, including through the inclusion of digital parenting into existing parenting programmes offered by the state and NGOs. Restrictive parenting practices, which prevent children from developing the necessary skills and capacities to both stay safe online and to realise the benefits and opportunities that the internet and technology offer, are often fuelled by fear and a sense of disempowerment on the part of parents and caregivers.[22] Yet, these parenting styles and approaches to keeping children safe also undermine children's own sense of agency, and ultimately, their safety. Programmes are therefore needed to empower parents and caregivers, foster their own digital literacy and competencies, and support them in fostering healthy, resilient and positive online behaviours in their children.

Finally, and most importantly, children need access to information, education and training to support the development of their own digital literacy skills and ensure that they are equipped with age-appropriate knowledge and skills to successfully navigate both threats and opportunities online, and with the confidence and knowledge to seek help and assistance when needed, and know that it will be provided.

Conclusion

The COVID-19 pandemic and the digital revolution has led to an exponential rise in technology and internet use. Growing up in a digital world has offered children opportunities as well as exposure to risk. To comprehensively understand children's mental health in relation to the digital environment, a balanced consideration of both risks and opportunities is required, recognising the full range of children's rights in a digital world. This balance should inform the provision of services to children to manage the risks and fully realise the potential benefits that digital technology and social media offer for children's well-being and mental health. This includes recognising the role that parents and caregivers, educators, government regulators and industry, and children themselves have to play in promoting children's mental health and well-being in all aspects of children's online engagement, from online play to learning to civic participation.

References

1. World Health Organization. *Critical preparedness, readiness and response actions for COVID-19: Interim guidance, 22 March 2020*: WHO; 2020. Accessed: 19 April 2022. Available from: https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19.
2. UNICEF. *COVID-19 and its implications for protecting children online*: 2020. Accessed: 27 May 2020. Available from: https://www.unicef.org/media/67396/file/COVID-19%20and%20Its%20Implications%20for%20Protecting%20Children%20Online.pdf.
3. Livingstone S, Winther DK, Saeed M. *Global Kids Online Comparative Report*. 2019. [https://ideas.repec.org/p/ucf/inorer/inorer1059.html]
4. Kemp S. *Digital 2021: South Africa*: 2021. Accessed: 1 December 2021. Available from: https://datareportal.com/reports/digital-2021-south-africa.
5. Phokeer A, Densmore M, Johnson D, Feamster N, editors. *A first look at mobile internet use in township communities in South Africa*. Proceedings of the 7th Annual Symposium on Computing for Development; 2016.
6. Burton P, Leoschut L, Phyfer J. *South African Kids Online: A glimpse into children's internet use and online activities*. Cape Town: The Centre for Justice and Crime Prevention. 2016.
7. Singh A. Bridging the digital divide: The role of universities in getting South Africa closer to the global information society. *South African Journal of Information Management*. 2004;6(2).
8. Beger G, Sinha A, Pawelczyk K. *South African mobile generation: Study on South African young people on mobiles*. New York: UNICEF. 2012.
9. Stewart R, El-Harakeh A, Cherian SA. Evidence synthesis communities in low-income and middle-income countries and the COVID-19 response. The Lancet. 2020;396(10262):1539-1541.

10. Terre des Hommes. *#CovidUnder19: Life under coronavirus – results of the survey*: 2021. Accessed: 20 August 2021. Available from: http://globalkidsonline.net/covidunder19-summit/.
11. Byrne J, Burton P. Children as internet users: How can evidence better inform policy debate? *Journal of Cyber Policy*. 2017;2(1):39-52.
12. Livingstone S, Stoilova M. *The 4Cs: Classifying Online Risk to Children*. 2021.
13. Drouin M, McDaniel BT, Pater J, Toscos T. How parents and their children used social media and technology at the beginning of the COVID-19 pandemic and associations with anxiety. *Cyberpsychology, Behaviour and Social Networking*. 2020;23(11):727-736.
14. Stasiak K, Fleming T, Lucassen MF, Shepherd MJ, Whittaker R, Merry SN. Computer-based and online therapy for depression and anxiety in children and adolescents. *Journal of Child and Adolescent Psychopharmacology*. 2016;26(3):235-245.
15. Livingstone SP, K. *Playful by Design: A vision of free play in a digital world*. London: 5Rights Foundation, Digital Futures Commission; 2021.
16. United Nations Committee on the Rights of the Child. *General Comment No. 25 (2021) on children's rights in relation to the digital environment*. New York: United Nations. 2021.
17. UNICEF. *Our lives online: Use of social media by children and adolescents in East Asia—Opportunities, risks and harms*. UNICEF. 2020. [https://www.unicef.org/eap/media/4691/file/Our%20lives%20online.pdf]
18. UK Council for Internet Safety. *Digital Resilience Working Group Policy Paper*: 2021. Accessed: 12 December 2021. Available from: https://www.drwg.org.uk/the-framework
19. Kardefelt-Winther D, Maternowska C. Addressing violence against children online and offline. *Nature Human Behaviour*. 2020;4(3):227-230.
20. Department of Basic Education. Guidelines on e-safety in schools: *Educating towards responsible, accountable and ethical use of ICTs in education. (Updated)*. Pretoria: DBE. [Accessed 3 May 2022: [https://wcedonline.westerncape.gov.za/documents/eLearning/eLearningCircMins/minutes/del4_18.pdf]
21. Livingstone S, Atabey, A., Pothong, K. *Addressing the problems and realising the benefits of processing children's education data: Report on an expert roundtable*. Digital Futures Commission: 5Rights Foundation; 2021.
22. Livingstone S, Blum-Ross A. *Parenting for a digital future: How hopes and fears about technology shape children's lives*: Oxford University Press, USA; 2020.
23. See https://webrangers.co.za/web-ranger-curriculum/.
24. See chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/viewer.html?pdfurl=https%3A%2F%2Fmediamonitoringafrica.org%2Fwp-content%2Fuploads%2F2021%2F11%2FDisinformation-Comic-Book.pdf&clen=23059661&chunk=true.
25. Livingstone S, Mascheroni G, Stoilova M. The outcomes of gaining digital skills for young people's lives and wellbeing: A systematic evidence review. *New Media & Society*. 2021:14614448211043189.
26. World Health Organization. *Youth-centred digital health interventions: A framework for planning, developing and implementing solutions with and for young people*. Report No.: 9240011714. Geneva: WHO. 2020.
27. Hall J, Jordan S, van Ommeren M, Au T, Sway RA, Crawford J, Malik A. Sustainable Technology for Adolescents and youth to Reduce Stress (STARS): A WHO transdiagnostic chatbot for distressed youth. *World Psychiatry*. 2022;21(1):156.
28 Carswell K, Harper-Shehadeh M, Watts S, van't Hof E, Abi Ramia J, Heim E, van Ommeren M. Step-by-Step: A new WHO digital mental health intervention for depression. *mHealth*. 2018;4.
29. Lecomte T, Potvin S, Corbière M, Guay S, Samson C, Cloutier B, Khazaal Y. Mobile apps for mental health issues: Meta-review of meta-analyses. *JMIR mHealth and uHealth*. 2020;8(5):e17458.
30. Torous J, Wisniewski H, Liu G, Keshavan M. Mental health mobile phone app usage, concerns, and benefits among psychiatric outpatients: Comparative survey study. *JMIR Mental Health*. 2018;5(4):e11715.
31. Firth J, Torous J, Nicholas J, Carney R, Pratap A, Rosenbaum S, Sarris J. The efficacy of smartphone-based mental health interventions for depressive symptoms: A meta-analysis of randomized controlled trials. *World Psychiatry*. 2017;16(3):287-298.
32. Firth J, Torous J, Nicholas J, Carney R, Rosenbaum S, Sarris J. Can smartphone mental health interventions reduce symptoms of anxiety? A meta-analysis of randomized controlled trials. *Journal of Affective Disorders*. 2017;218:15-22.
33. Gericke F, Ebert DD, Breet E, Auerbach RP, Bantjes J. A qualitative study of university students' experience of Internet-based CBT for depression. *Counselling and Psychotherapy Research*. 2021;21(4):792-804.
34. Bantjes J, Kazdin AE, Cuijpers P, Breet E, Dunn-Coetzee M, Davids C, Kessler RC. A web-based group cognitive behavioral therapy intervention for symptoms of anxiety and depression among university students: Open-label, pragmatic trial. *JMIR Mental Health*. 2021;8(5):e27400.
35. Cuijpers P, Auerbach RP, Benjet C, Bruffaerts R, Ebert D, Karyotaki E, Kessler RC. Introduction to the special issue: The WHO world mental health international college student (WMH-ICS) initiative. *International Journal of Methods in Psychiatric Research*. 2019;28(2):e1762.