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Multiple Impacts on Adolescent Well-Being During COVID-19 School Closures: Insights From Professionals for Future Policy Using a Conceptual Framework

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A B S T R A C T

Purpose: This study explores the impacts of school closures during the COVID-19 pandemic on the domains of adolescent well-being from the UN H6+ framework, reported by health and educational professionals worldwide.
Methods: Semistructured individual online interviews were conducted in six languages during the second wave of the COVID-19 pandemic (March–December 2021) with health and education professionals who volunteered for follow-up after participating in an anonymous online survey. The UN H6+ 5-domain conceptual framework of adolescent well-being was used as a framework for the directed content analysis of the combined interview dataset.
Results: A total of 60 interviews—translated into English—were analyzed from 38 education and 22 health professionals in 28 countries/territories. Participant reports showed impacts on all five adolescent well-being domains, but mainly domain 1 (good health and nutrition), domain 3 (safety and a supportive environment) and domain 4 (learning, competence, education, skills, and employability). Reflections of 2-connectedness and 5-agency were also present. Their reports included mainly negative impacts, but also some positive insights to take forward.
Discussion: Policymakers must recognize impacts of school closures during the pandemic on multiple domains of adolescent well-being and the potential for widening inequalities. Schools play a critical mitigating role that goes beyond education. The call to action for the adolescent health community is to recognize and address ongoing potential long-term impacts on well-being

IMPLICATIONS AND CONTRIBUTIONS

This study shows multiple, intersecting impacts of the COVID-19 pandemic on adolescent well-being, and the potential for widening inequalities, making a case for caution regarding school closures in future health crises. The UN H6+ conceptual framework facilitated the analysis of this large, diverse qualitative international dataset.

Conflicts of interest: Dr. Gray is a council member of the International Association for Adolescent Health, which is supported by a grant from the AstraZeneca Foundation. Dr. Gray, Ms. Chabot, Dr. Tsai, and Prof. Jourdan are members of the UNESCO Chair "Global Health and Education", which is supported by the nonprofit organizations MGEN and Groupe Vyv. University Clermont-Auvergne and the University of Huddersfield provide in-kind contributions to support the Chair secretariat. No other authors report a possible conflict of interest.

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and inequalities in their everyday practice. It is also important to advocate locally, nationally, and globally for careful consideration of the consequences of school closures in future health crises.

During the COVID-19 pandemic, governments worldwide proactively closed schools, colleges, and universities to slow virus transmission. These measures aimed to relieve the burden on health-care systems and safeguard vulnerable communities [1]. A study using a simulation model comparing school reopening and closures showed that the percentage of the infected population was 13% lower when schools were closed [2]. These closures, however, significantly impacted the daily lives of adolescents, with a range of impacts on their well-being [3,4].

School closures and social distancing posed challenges for adolescents during a critical period when they begin to prioritize peer relationships over parental ones [1]. During the pandemic, families were required to stay at home, with some experiencing high levels of stress and unable to receive face-to-face support [5]. Social isolation, quarantine, and the inability to use familiar coping mechanisms, such as personal space, visiting friends and family, and other activities, were likely to worsen the effects of these stressors [6,7].

According to a meta-analysis, depression and anxiety symptoms in young people were 25.2% and 20.5% during the pandemic, and prepandemic percentages were 12.9% and 11.6%, respectively [8]. Further studies suggested associations between school closures, social exclusion, and mental health in adolescents, including anxiety [9], hyperactivity, and inattention [10]. According to *the Lancet Commission on Lessons for the Future from the COVID-19 Pandemic,* school closures resulted in the absence of a structured routine and peer interactions, which in turn "disrupted the lives of children; amplified the anxiety caused by isolation and their fears of the disease; and led to the loss of physical, intellectual, and social engagement" [11].

Furthermore, school closures disproportionately negatively impacted the most vulnerable, who depended on the resources offered by their schools because they are multifaceted institutions that offer students not only education but also food, security, welfare, and opportunities for social and cognitive growth [12,13].

In response to school closures, many institutions implemented online learning and digital resources to alleviate the adverse effects. According to United Nations Children's Fund, however, a third of the world's pupils lacked access to digital learning facilities [14]. The COVID-19 pandemic had a disproportionate impact on individuals residing in deprived socioeconomic surroundings, and in low- and middle-income countries [15,16].

During the global first wave of the pandemic, in the summer of 2020, a conceptual paper was published in the *Journal of Adolescent Health* from the United Nations (UN) H6+ Technical Working Group on Adolescent Health and Well-Being (henceforth referred to as the "UN H6+ framework") [17]. Its purpose was to propose a framework for defining, programming, and measuring adolescent well-being. The extended definition of adolescent well-being was that "Adolescents have the support, confidence, and resources to thrive in contexts of secure and healthy relationships, realizing their full potential and rights".

The five interconnecting domains of the framework reflect the "multidimensional nature of well-being", of which good health (physical and mental) is one component alongside connectedness, safety, education, and agency (Figure 1). It offers a robust approach to adolescent well-being through its global endorsement by major UN agencies (United Nations Children's Fund, World Health Organization, United Nations Population Fund, UN Women, Joint United Nations Programme on HIV/AIDS, and World Bank), its comprehensive integration of physical, mental, and social dimensions of health, and its direct alignment with Sustainable Development Goals 3, 4, and 10 focused on health, education, and reducing inequalities.

This study explores the multiple impacts of school closures during the COVID-19 pandemic on adolescents, as reported by health and education professionals. Grounded in the five domains of the UN H6+ conceptual framework, it provides a multidimensional perspective of adolescent well-being. These insights can inform future health and education policies, and support health and education professionals in promoting adolescent well-being as the educational catch-up and recovery from the pandemic continues.

Methods

This study is a secondary analysis of semistructured online interviews exploring education and health professionals' experiences and views regarding the safe reopening of schools.

Recruitment and participants

Respondents were recruited through a request for follow-up interviews at the end of an online survey about school closures. The survey was disseminated globally through email contacts and social media with the collaboration of the United Nations Educational, Scientific, and Cultural Organization Chair "Global Health and Education" [18] community and partners between January and September 2021. Data saturation for high-level themes was sought, with an initial target of at least 15 interviews with education professionals and 15 with health professionals.

The research protocol was approved by the institutional review board of the University of Clermont-Auvergne (number IRB00011540-2020-65). Data Protection Officer (DPO) declaration number EPE UCA-2021-006. Each volunteer was sent a participant information sheet by email. Our original plan was to ask for scanned copies of signed consent forms by email: some participants consented by that means, but we received feedback that many professionals were now working from home and did not have a printer available. We applied successfully for a minor amendment to the protocol to take verbal informed consent at the beginning of the interview, thus not disadvantaging any prospective participants.

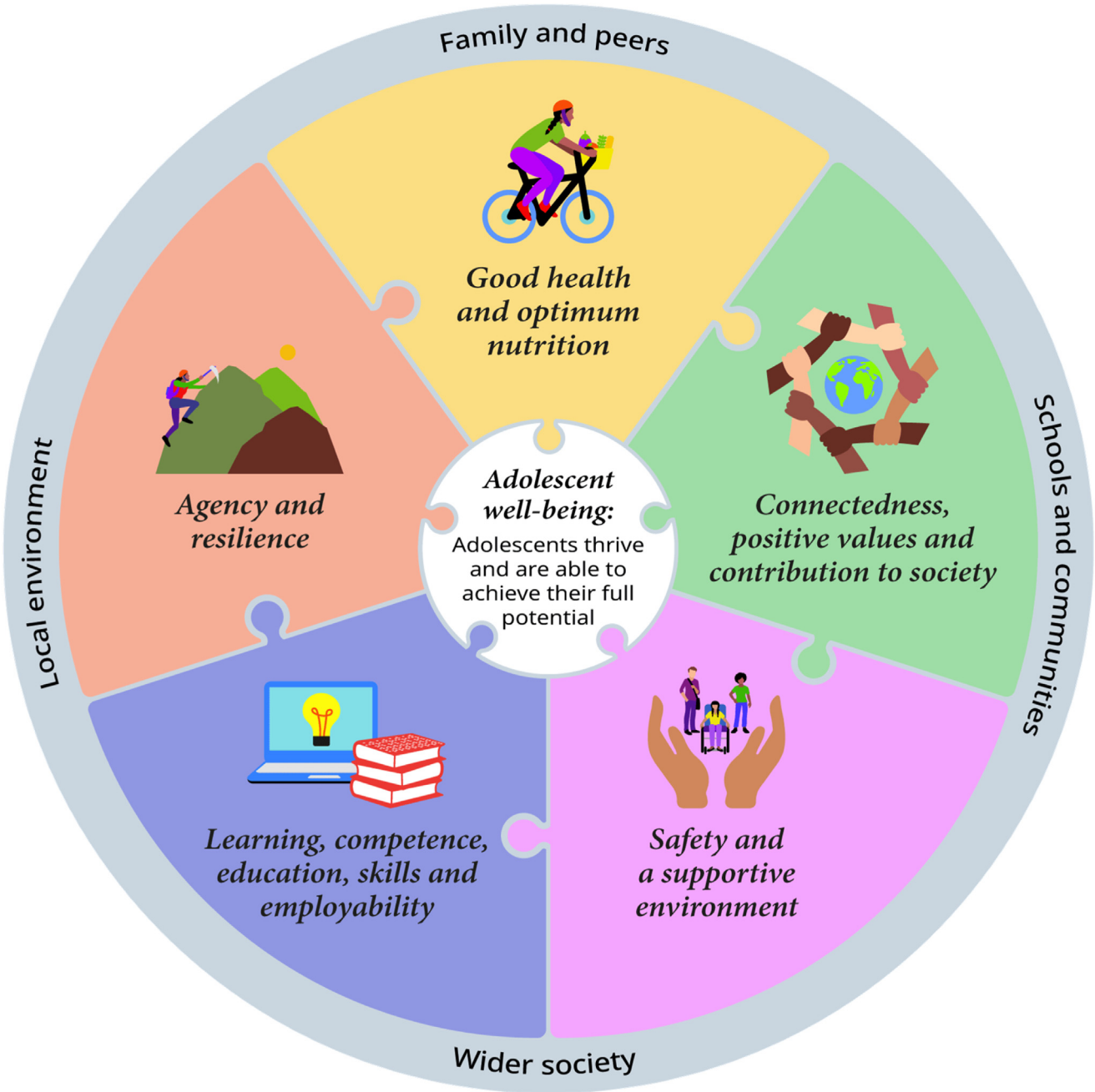

Figure 1. UN H6+ framework [17]—the five interconnected domains of adolescent well-being https://www.who.int/activities/promoting-adolescent-well-being. Required in colour for both web and print (understanding that a fee will be charged for print).

Data collection

The interview topic guide was developed with the input of a consortium of partners (https://unescochair-ghe.org/resources/covid-19-and-schools/current-research-on-school-reopening/), composed of various research teams—in terms of thematic interests and a diverse range of organizations (learned societies, networks of professionals, and education unions). It was also based on the authors' survey work at the start of the pandemic [19]. The interview guide explored the following themes: (i) the effect of the pandemic on schools, pupils, and teachers; (ii) the reorganization of schools during lockdowns and the return to class; (iii) the experience of implementing infection control measures in schools; (iv) intersectoral collaboration in schools involving education and health professionals; and (v) the important resources for keeping schools open. All respondents were asked core questions, and then specific questions were tailored to the context of either education or health professionals.

Online interviews took place on Zoom or Google Meet between March and December 2021 in six languages—Arabic, English, French, Mandarin, Portuguese, and Spanish—conducted by postgraduate students working with the consortium research teams, who were native speakers of those languages. N.J.G. coordinated the overall interview process and the English and Spanish interviews; the French and Arabic interviews were overseen by D.J., Portuguese by G.S.C., and Mandarin by M.T.

Data analysis

Audio recordings were transcribed in the original language and then translated wherever necessary to English. A directed content secondary analysis [20], based on the five domains and subdomains of the UN H6+ framework (Table 1) [17], was undertaken on the English language version of all transcripts. The process was managed using NVivo (Lumivero, Denver, CO) qualitative analysis software. S.M. and C.C. carried out the coding and initial writing; N.J.G. reviewed the analysis and engaged the coders in an iterative process.

Results

A total of 125 semistructured online interviews were conducted from March to December 2021 with participants from 30 countries/territories. Almost one-third of respondents were teachers (31%, n = 39); the other professional backgrounds were more diverse, including professionals from the health or public health sector (30%, n = 38), head teachers/principals (12%, n = 15), and education support staff (4%, n = 5). Most respondents (71%, n = 89) were working in a school, mainly in urban areas (48%) and in the public sector (42%). Respondents worked across the student age range from 0 to 19 years.

Sixty interviews were selected for coding and secondary analysis (Table 2) based on maximum diversity in terms of education (n = 38) and health (n = 22) professionals; the student age range for education professionals (10- to 19-year-old adolescents); setting, for example, public and private schools; and world regions, with 28 countries/territories covered in six languages.

Table 1
Coding structure—the five domains and subdomains of the UN H6+ framework [17]

Domains	Subdomains
1 - Good health and optimum nutrition	• Physical health and capacities • Mental health and capacities • Optimal nutritional status and diet
2 - Connectedness, positive values, and contribution to society	• Connectedness • Valued and respected • Attitudes • Interpersonal skills • Activity • Change and development
3 - Safety and a supportive environment	• Safety • Material conditions in the physical environment • Equity • Equality • Nondiscrimination • Privacy • Responsive
4 - Learning, competence, education, skills, and employability	• Learning • Education • Resources, life skills, and competencies • Skills • Employability • Confidence that they can do things well
5 - Agency and resilience	• Agency • Identity • Purpose • Resilience • Fulfilment

1. Good Health and Optimum Nutrition

Impact on mental health

Most education and health professionals emphasized that one of the major impacts of the pandemic was on students' mental health. Words used to describe the students' mental state/well-being (acknowledging the possible limitation of translation from other languages) included "stressed", "traumatized", "overwhelmed", "fatigued", "anxious", "depressed", "frustrated", and "burdened".

Students were also described as "afraid" of being infected with COVID-19, of being discriminated against while having the infection, of passing on the infection to parents and grandparents, and of losing family members. This fear was heightened by the images and numbers of deaths reported in the media.

Some participants, particularly health professionals, pointed out that suicides and behavioral disorders such as eating

Table 2
Demographic characteristics of interview participants (n = 60)

Characteristic	N =	Categories	N =
Language of interview	60	Arabic	2
		English	14
		French	17
		Mandarin	19
		Portuguese	7
		Spanish	1
WHO Region	60	Africa	13
		Americas	7
		Eastern Mediterranean	3
		Europe	12
		Southeast Asia	1
		Western Pacific	24
Professional background—Health	22	Health-care professional	15
		Public health professional	6
		Researcher	1
Professional background—Education	38	Teacher	23
		Education support staff	2
		Head teacher/Principal	6
		University teacher	7
Funding of school/university	38	Public	17
		Private	6
		More than one funding type	1
		Missing	14
Setting of school/university	38	Rural	4
		Suburban	1
		Urban	18
		More than one setting	1
		Missing	14

Countries/territories (A-Z) (n = 28) (1 or more interviews from each).
Algeria, Armenia, Australia, Benin, Brazil, Burundi, Cameroun, China, Egypt, France, Greece, Guadeloupe, India, Lebanon, Mozambique, New Caledonia, Nigeria, Norway, Peru, Philippines, Portugal, Romania, Scotland, Senegal, Switzerland, Taipei, United States, Zambia.

disorders, video game/screen addiction, substance abuse, attention deficit hyperactivity disorder, delinquency, and self-harm were increasing.

> "I'm happy that they kept the schools open… to save the mental health of some people… As you see with some people depression, frustration, and even some going to the extent of writing things that, you know, can make them to commit suicide… So at least when they came back to school, they were happy that they were in school so that made them busy." (Education professional, Nigeria, EN02)

Impact on physical health and nutrition

Education and health professionals shared that the pandemic impacted many diverse aspects of students' physical health. For example, some participants asserted that myopia was on the rise among students due to increased screen time over a prolonged duration. Some health professionals felt that students with chronic illness had been badly affected, because health services were not functioning smoothly:

> "We had a critical period last year during the lockdown because they had no good access to health care… A subset of young people with chronic disorders for those reason, have probably been less compliant with their treatment." (Health professional, Switzerland, EN18)

Participants said that students' physical activity had decreased because of confinement and isolation, and eating disorders had increased, leading to an increase in overweight and obesity. Some participants felt that school closure led to less access to good food, but others reported that students continued to collect food from their school or community organizations:

> "There was a whole movement for the schools re-opening… about mental health, violence and all the problems of children that were not able to go to school, and exactly one problem: food, food insecurity. Many of the children and teenagers go to school because of the lunch break." (Health professional, Brazil, EN20).

Regarding adherence to infection control measures, many education professionals and some health professionals spoke of good/positive behavior change in students:

> "They [students] now wear the mask with great responsibility…They snack in the classroom, they wash and disinfect their hands before snacking and they wash and disinfect their table themselves." (Education professional, Portugal, PT39)

2. Connectedness, Positive Values, and Contribution to Society

Impact on social connection

Many participants felt that the social life of students was being affected by the pandemic. Some education and health professionals explained that adolescents missed meeting their friends and teachers, and did not like being isolated at home or being in online classes where they could not interact with one another:

> "At least from my perspective, it [remote learning] works at times… And then I have the impression that when we settle down in time, there is weariness, a kind of anger on the part of the students too. They're fed up, they don't want it like this anymore…" (Health professional, France, FR10)

Some teachers shared that students were very happy when school reopened, and they got to meet their friends:

> "When the primary school reopened on Monday, well it was a great joy for everyone… Also, for the kids, because what they have now, that they didn't have during the first wave, is that they also have their after-school club." (Education professional, Scotland, FR24)

A school health expert reflected that the lack of socialization could have a long-term impact on their social skills and mental health, adding that lack of social interactions could also hamper learning. Other professionals reported that some students had also experienced losses of loved ones, impacting their mental health and weakening their social support network.

3. Safety and a Supportive Environment

Two elements from the framework were particularly reflected in the accounts of the education and health professionals: emotional and physical safety and equity.

Impact on emotional and physical safety

Professionals commented on the emotional and physical safety of students confined to the home, related to the home atmosphere and the conditions for learning. Some expressed concern about—and reported instances of—family-related stressors, including an increase in intra-family violence, the weakening of parents' relationships that could lead to divorce, and risks of abuse to the young people in the home. There were also reports of parents being excessively fearful about the virus, resulting in compulsive cleaning and restrictive measures.

The prospect of returning to school revealed professionals' physical safety concerns. School opening and closure cycles, precipitated by infection clusters during 2021, did not inspire confidence. Participants noted that basic facilities to increase safety from infection (e.g., running water for handwashing) had still not been implemented:

> "In some of rural parts of Romania… the WC is in the garden, in the school, so they haven't enough water, or hygienic material, so this situation is very difficult for the children that are not in an urban school." (Health professional, Romania, EN17)

Some education professionals in Taipei shared that they personally called on students to ask general well-being questions, to see their home environment and ensure their safety.

Impact on equity

The inequities apparent in many countries' experiences of the pandemic were numerous and varied. Those living in rural areas, which often overlapped with lower economic means, had problems accessing the Internet or buying equipment:

> "Sometimes it becomes difficult… for you to convince just the parent that this is important… the economy the way it is nowadays, things are expensive… very few people have even

laptops to help the children so they can learn through technology." (Education professional, Zambia, EN05)

Even when school reopening was possible, economic inequities meant that some students could no longer attend as their families had lost income during the lockdown, which prohibited travel and other educational costs.

Another area of inequity explored was related to students living with chronic illness and disabilities. Participants had much to share on this matter. Some professionals reported that these students stayed out of school longer than others, isolated for fear of greater vulnerability to infection:

"I had a little insulin-dependent diabetic. He wanted to come back, but the school refused to take him in… afraid of having to deal with … something that we couldn't handle… the principal refused… to integrate him into the school despite the parents' request." (Education professional, France, FR08)

Others reported that when national governments and schools made provision for special groups of students to carry on attending throughout the pandemic, notably the children of key workers (e.g., healthcare, emergency response), students with special needs could be included in that provision. They included students with chronic illness and students with other disadvantages.

4. Learning, Competence, Skills, Education, and Employability

Most of the data relevant to this domain from our study relate to the impact on learning (both remote and in-person), but there is also some discussion of employability.

Impact on Learning

Remote learning. Almost all education professionals, and many health professionals, spoke of the impact of the pandemic on students' learning. Most education professionals felt that remote learning was not as effective as face-to-face learning, as the teachers could not monitor students effectively. In Taipei, however, education professionals reported long-term planning for strategies to reduce learning loss if schools were closed:

"The education authorities have been preparing for this for a long time because they have seen the example of foreign countries, where even though the schools were closed, the learning did not stop… I personally feel that the quality of education in schools during the epidemic is a top priority for the government's policy because children's learning cannot wait. (Education professional, Taipei, TP03)

The frequently reported drawback of remote learning by education professionals was that it contributed to inequities. In countries without digital infrastructure, hard copy learning was attempted. A participant from Mozambique reported that schools planned to create printed worksheets, but it failed because students, parents, and teachers were afraid of infection:

"During the pandemic… we were supposed to design some handouts… for students to come and pick them at school. But most of the students were afraid of coming, they demanded that the parents will be the ones coming to school to pick those papers. And even the teachers were not designing because they were also afraid of getting contaminated when they were exchanging the papers… Honestly, it didn't work." (Education professional, Mozambique, EN40)

Other learning. There were mixed views about the impact of education quality during the pandemic. For example, a participant from New Caledonia shared that they focused mainly on French and Mathematics, and the other subjects were neglected due to reduced study hours:

"Since there were 15 days to 3 weeks less of school, we have to target certain things… we really put the focus on French and Maths. And it's true that the other disciplines are a little neglected." (Education professional, New Caledonia, FR14)

A minority of teachers noted, however, that the examination results during the pandemic indicated no or little impact on learning.

There were descriptions of measures taken to provide additional support. For example, a health professional from Algeria reported that many students received private tutoring before exams to help them through it. A teacher from Portugal shared that, in their school, they provided additional support to students, which they felt led everyone to succeed:

"In the first confinement, we had already listed which students needed educational support. And we saw which kids were lagging, who had more difficulties, and we gave them more hours of support than the others. And it worked. We had 100% success at the end of the school year." (Education professional, Portugal, PT40)

Impact on employability

A teacher from Mozambique shared that they had to cancel the end-of-year examinations for all grades in their school, which meant all students progressed to the next grade without examinations. The disruption to national and professional examinations meant that a cohort of students would miss the assessments that would move them into their next stage of training. This might have consequences for their job prospects:

"We can say that especially among high school children, there is a net increase in ill-being… Because these are young people who are imagining or rather dark perspectives of their future… What will become of me?' That's why we said to ourselves that it was certainly linked to that. A lack of future prospects." (Health professional, New Caledonia, FR19)

The closure of many businesses and the consequent threat to their future viability also reduced the availability of paid employment for young people who did not wish to pursue higher education. The closure of many public institutions would also impact the provision of training placements for young aspiring professionals such as teachers and health-care workers.

5. Agency and Resilience

There were fewer reflections relating to this framework domain than others. There was, however, a report of young people in Nigeria organizing themselves into a protest group. The participant felt that their efforts created tension with local decision-makers that resulted in making the reopening of schools a priority:

> "Keeping schools open is actually a priority here… because some youth [were] organizing themselves for protest… Parents, the government and the general public, they became worried because they now found out that it was because students are at home, that youths were able to get themselves organised… That was why the government now saw reopening of schools as a priority when we started." (Education professional, Nigeria, EN02)

Moreover, in Peru, youth had been included in a consultation process to define recommendations for future health crises.

> "[We got] recommendations on the pandemic, recommendations for education, and everything has been built by education, health, civil society and children. Children and adolescents have also participated… Everything written is very good, but it doesn't always come true." (Health professional, Peru, SP05)

Other participants pointed out that the first lockdown in 2020 helped build resilience, making everyone better prepared to accept, manage, and live through subsequent lockdowns.

Discussion

Data from this global study, underpinned by the UN H6+ conceptual framework, demonstrated the multiple impacts of school closures on adolescent well-being. They illustrated the worsening situation of students with mental and physical health risks caused by classroom closures, the widening inequities in learning opportunities, the differences in geographical problems and responses, and the need for meaningful collaboration between education and health professionals.

This study has the strength of a large-scale diverse interview dataset with insights about all five well-being domains. However, we acknowledge several limitations such as variable coverage in different world regions. These qualitative data are not generalizable to populations, but they present a diverse global view of school closure impacts. We may have lost some nuance by analyzing only English translations of the original transcripts. The professionals made statements that are likely to have been influenced by a combination of observation, the media, and their own reading/scholarship during the pandemic.

Our multidomain findings show many consistencies with previous research in one or more of these well-being components. Regarding domain 1, mounting evidence demonstrated deterioration in mental and physical health, some of which is ongoing [8,21,22]. Millions of students from low-income settings were exposed to food insecurity [23]. Researchers noted "social disconnectedness" among students (domain 2), including feelings of social isolation and loneliness [8,21]. Concerning safety (domain 3), school closures (coupled with the lockdown) caused many students to spend a greater amount of time with their parents, which was particularly harmful for students living in an abusive family environment and those living with chronic illness [24–26]. School closures increased inequalities in education (domain 4), which need to be remedied to rebuild postpandemic human capital and ensure better well-being later in life [27]. A 2023 meta-analysis asserted loss of about 35% of a typical school year's learning [28]. For agency (domain 5), adolescent insurgency was seen during lockdown, including breaking the rules by running away from home to meet friends [29], but also ongoing involvement in protests [30–32].

Participants offered ideas and recommendations about remedial and preventive work, looking to the future and addressing the deficits from the past, including (a) targeting additional tutoring for struggling students (Portugal); (b) optimizing remote learning practices (Taipei); (c) prioritizing school attendance (Nigeria); and (d) involving adolescents in decision-making (Peru). Although many negative impacts were identified, some comments by professionals described positive student conduct in implementing measures and in continuing their studies. This must be celebrated and supported. Based on these findings, we offer recommendations for education and health policies and programs that are required in the future to prepare for the next health crisis.

Fundamentally, education policies need to see schools as infrastructure that supports multiple aspects of adolescent well-being, not just as a teaching–learning system. Our findings showed that school closures affected not only learning but also mental health, nutrition, and social connectedness. At a health policy level we recognize the need to link physical and mental health. In addition to ensuring that students with chronic conditions continue to receive care during disruptions, it is important to integrate mental health services into school contexts to ensure the necessary responses to cases of depression, anxiety, and behavioral disorders.

The ongoing impact of school closures will require long-term analysis. A global child cohort study is needed that can identify how it is to grow up in a postpandemic, digital world. Future research could involve conducting action research or pilot projects to evaluate the effectiveness of interventions aimed at maintaining the health and education of adolescents during pandemics or periods of confinement.

Conclusion

Adolescents were among the most neglected groups during the COVID-19 pandemic; lockdown came at a critical point in their development in terms of socialization and gaining educational qualifications for life. School closures impacted all five UN H6+ domains of adolescent well-being and widened inequalities for certain groups of students. Schools play a critical role that goes beyond education. They serve as vital spaces for social interaction and support. Stakeholders and decision-makers must carefully consider the multidimensional consequences of future possible school closures by considering different domains of adolescent well-being during disease outbreaks, considering the broad context of young people's lives and their long-term health and education prospects. Moreover, during the recovery from a pandemic, holistic strategies related to adolescent well-being (i.e., not just a focus on educational catch-up) are needed to mitigate the long-term consequences of these restrictions and to avoid repercussions in the future—because improving and maintaining the well-being of adolescents is fundamental for future global prosperity and equity.

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