



The Silent Pandemic: the Impact of COVID-19 on the Mental Health of Adolescents Living with HIV

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Abstract

Purpose of Review The pandemic caused by the coronavirus disease (COVID-19) has resulted in millions of confirmed cases and likely more than six million deaths globally Worldometer (2022). We sought to understand secondary mental effects in adolescents living with HIV (ALHIV) on the African continent caused by lockdowns, school closures, and other restriction measures for infection control. We reviewed the broader literature and conducted 86 retrospective chart reviews of mental health disorders of ALHIV and interventions utilized at a pediatric clinic in Eswatini.

Recent Findings ALHIVs are disproportionately affected by mental health disorders. The COVID-19 pandemic has exacerbated adverse mental health outcomes of adolescents on the African continent, especially for ALHIV. There have been many calls for researchers, clinicians, and governments to prioritize mental health in adolescents going forward.

Summary In pediatric clinics in Eswatini, Malawi, and Uganda, there were psychosocial measures in place prior to the COVID-19 pandemic for ALHIV. After looking closely at a pediatric clinic in Eswatini, we found that many interventions were paused and new psychosocial interventions compatible with social distancing were instead utilized by clinicians. Even so, after multidisciplinary management comprising of interventions such as psychotherapy, pharmacotherapy, referral to psychologists/psychiatrists, and enrollment in peer support groups, the PHQ-9 depression scores of ALHIV during the COVID-19 significantly improved. We found that there is a need for age-specific standardized tools to measure depression in ALHIV. Furthermore, more research is needed on the effectiveness and scope of psychosocial interventions for ALHIV post-COVID-19 throughout Eswatini and the African continent.

Keywords Mental disorders · Depression · Adolescents · Adolescents living with HIV (ALHIV) · COVID-19 · Africa · Eswatini

Background

In 2019, UNICEF estimated nearly 37 million adolescents (between 10 and 19 years old) were living with a mental health disorder on the African continent. Among 15- to

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19-year-olds, approximately 13.5% were estimated to have a mental health disorder [1].

With TB and HIV as the second and third highest killers respectively of 15- to 19-year-olds on the African continent [1], donor and government resources for child healthcare have historically been channeled towards infectious diseases, leaving child and adolescent mental health care underfunded and overlooked [2, 3]. As suicide is the ninth leading cause of death for this age group on the African continent, mental health must not be ignored [1]. Furthermore, adolescents living with HIV (ALHIV) face stigma and discrimination and are more likely to suffer from mental health disorders such as depression and anxiety [4••].

The World Health Organization declared the novel coronavirus disease (COVID-19) a pandemic in March 2020 [5], and countries implemented a variety of primary prevention initiatives aimed at ensuring expedient isolation of all active cases, infection control, and bending the COVID-19 transmission curve. Containment measures implemented by African countries included traveling restrictions, school closures, lockdown, home confinement, and curfews. Many researchers and practitioners predicted an unprecedented toll on mental health [3, 6, 7]. For children, it was predicted that school closures and economic decline would be followed by secondary impacts such as an increase in teen pregnancies, domestic violence, poverty, food insecurity, orphanhood, and child-headed households [8, 9, 10•, 11–21]. Hence, scholars called for mental health interventions to be prioritized to mitigate the compounding effects of the COVID-19 pandemic on African children. Some of the suggested interventions included more robust social work policies [8], economic empowerment and mental health literacy [10•], continued support of non-COVID-19 child health, more research on COVID-19 in children [12], and mental health interventions adapted from those already in place which supported children living with HIV [22].

As the COVID-19 pandemic progressed, the adverse mental health effects on children were well studied globally [23–25]. On the African continent, the literature is more scarce, though the stark mental health effects of the prolonged COVID-19 pandemic is gradually becoming more apparent. In April and May of 2020, a web-based cross-sectional survey in seven African countries found that more than half of the participants reported experiencing mental health symptoms in the initial COVID-19 lockdowns [26]. A telephone interview was conducted for more 1700 adolescents in Burkina Faso, Ethiopia, and Nigeria. The results showed extreme inequity in educational experiences and increased media consumption. More than 20% of adolescents reported mild to severe symptoms of psychological distress [27•].

Children on the African continent have suffered from the withdrawal of outdoor activities, severed friendships,

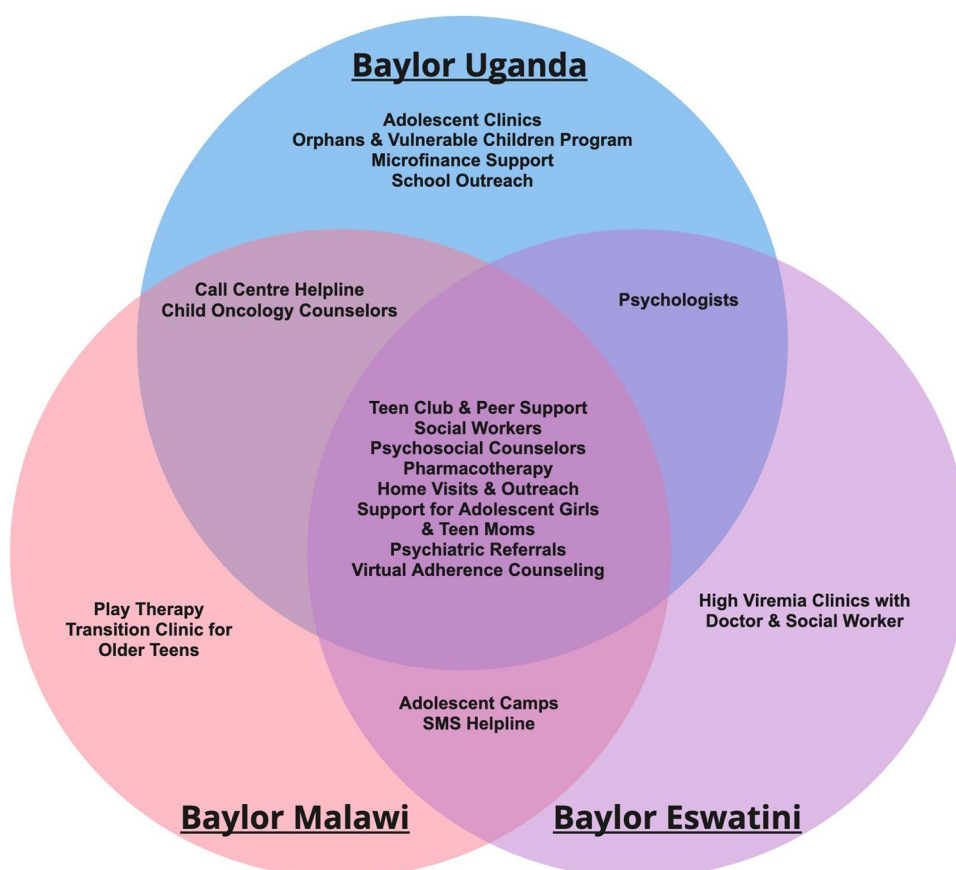
disruption of peer and school support programs, limited access to healthcare, and physical isolation. Yet there is a dearth of literature regarding the prevalence of mental health problems in pediatric populations as a result of measures implemented to curb the spread of COVID-19 in African countries. Specifically, the authors have not found studies within clinical settings on the African continent which focus specifically on the mental health impacts of the COVID-19 pandemic on ALHIV. It is important to understand how this population was affected because they were already disproportionately affected by mental health conditions prior to the COVID-19 pandemic. Furthermore, there is a need for the existing mental health support structures for ALHIV to be re-evaluated considering new mental health stressors such as the uncertainty of living amidst constantly evolving COVID-19 infection control measures. Assessing these mental health impacts is complicated by the fact there are no standardized pediatric-centric assessment tools or referral protocols for children or adolescents exhibiting adverse mental health symptoms.

Given the high prevalence of poverty, food insecurity, prolonged school closure, high teenage pregnancy rates, gender-based violence, child-headed households as a result of parental demise, and an emerging problem of recreational drug abuse, an increase in the prevalence of mental disorders among ALHIV as a result of the COVID-19 pandemic was predicted. Firstly in this paper, we review the mental health interventions for ALHIV prior to the COVID-19 pandemic in three clinical settings in Malawi, Eswatini, and Uganda. In the following section, we explore the impact of COVID-19 on the mental health of ALHIV in one clinical setting in Eswatini by detailing the proportion of ALHIV who were screened for mental health problems during the COVID-19 pandemic. Furthermore, we summarize the factors associated with the clinical presentation of adverse mental health symptoms and the psychosocial interventions which addressed these symptoms. Finally, we highlight strategies which resulted in improved mental health outcomes among ALHIV and effective coping mechanisms to deal with the biophysical stressors caused by the COVID-19 pandemic and containment measures.

Review of Mental Health Interventions for ALHIV in Eswatini, Malawi, and Uganda Prior to COVID-19

Though generalized child and adolescent mental health care is underfunded in African countries, mental health interventions integrated with HIV care are extensive and robust. Mental health treatment interventions were reviewed in three non-governmental clinical settings in Eswatini, Malawi, and Uganda. Each of these organizations specializes in child and

Fig. 1 This is a summary of mental health interventions for ALHIV in place at Baylor's College of Medicine Children's Foundation - Uganda (Baylor Uganda), Baylor College of Medicine Children's Foundation - Malawi (Baylor Malawi), and Baylor College of Medicine Children's Foundation - Eswatini (Baylor Eswatini)



adolescent healthcare, including the care and treatment of patients with HIV. An example is Teen Club, which is a psychosocial support forum for adolescents living with HIV who are fully disclosed of their status; these clubs have been shown to be tremendously successful in promoting positive living and good adherence to anti-retroviral medication [28]. Additionally, counseling and social work services are integrated with medical treatment and care at all three of these facilities. Adolescents are easily referred for counseling directly at the facility for non-complex psychosocial challenges such as adherence challenges to ART. Patients with complex mental health challenges are referred to psychologists or psychiatrists outside the facility. A complete picture of the mental health interventions that were in place prior and throughout the COVID-19 pandemic at these three clinical sites are highlighted in Fig. 1.

Some of these interventions, including Teen Club, had been in place for many years, but were paused for long intervals during the COVID-19 pandemic due to physical-distancing guidelines for COVID-19 infection control. These pauses meant that an important forum for psychosocial support for ALHIV was stripped away, compounding other hardships brought on by the COVID-19 pandemic. Nonetheless, there were also many successes and innovations in mental health interventions throughout the COVID-19

pandemic in these settings, such as launching virtual forums and virtual outreach initiatives. All three sites implemented psychosocial check-ins and counseling sessions via phone call during the COVID-19 pandemic.¹

The Case of Eswatini: The Mental Health Effects of the COVID-19 Pandemic on ALHIV

The multitude of new stressors for children and adolescents during the COVID-19 pandemic called for a deeper investigation of these clinical settings to better understand the impact on mental health disorders and the effectiveness of mental health interventions. Because Baylor Uganda, Baylor Malawi, and Baylor Eswatini are clinical settings in different countries with unique cultural and contextual factors, this rendered comparisons of clinical electronic medical record data very difficult. Thus, the Eswatini clinical site was chosen as a case study to explore the mental health impacts of the COVID-19 pandemic on ALHIV.

Baylor College of Medicine Children's Foundation — Eswatini (BCMCFE) is located in Mbabane, Eswatini. The

¹ Figure created using miro.com.

integrated package of care for ALHIV is provided through a government subvention from the Eswatini Ministry of Health and is accessible at no cost to the patient. Adolescent-friendly psychosocial support programs include but are not limited to Teen Club, Teen Mother's Club, and Teen Camps, all of which are tailored to support ALHIV. In March 2020, the first COVID-19 patient was diagnosed in Eswatini [29], leading to nationwide curfews, school closures, and lockdowns, with subsequent suspensions of some psychosocial support programs. Four COVID-19 waves during the reporting period had negative impacts on access to care and psychosocial follow-up for our ALHIV. Subsequently, an increase in the numbers of ALHIV presenting with symptoms of mental disorders was anecdotally noted in the clinic.

Methods

The electronic medical record system (EMRx) was queried to identify ALHIV (10–19 years) who had accessed psychology, outreach, peer education and treatment literacy services, been prescribed psychotherapy, been documented with a diagnosis of depression or behavioral change, or been presented to the social worker with psychosomatic symptoms between January 2019 and February 2022. Site-specific data on the prevalence of mental health problems were retrieved through a retrospective review of clinic electronic medical record (EMR) databases between March 2020 and January 2022, after the onset of COVID-19. PHQ-9 scores were extracted from clinic visit notes, social workers' notes, or EMRx alerts. We sought to determine the proportion of ALHIV who were screened for mental health problems during the COVID-19 pandemic in Eswatini, explore factors associated with clinical presentation of mental health symptoms, and document psychosocial interventions done.

Depression-screening scores were extracted from clinical notes that utilized the Patient Health Questionnaire (PHQ-9) to score each of the 9 DSM-IV criteria as “0” (not at all) to “3” (nearly every day). Severity of depression was graded according to the PHQ-9 score as follows: 0–4 none, 5–9 mild, 10–14 moderate, 15–19 moderately severe, 20–27 severe [30]. Treatment outcomes were measured by comparing subsequent PHQ-9 scores to that at baseline. The primary outcome was PHQ-9 score, and variables included in all analyses were age, gender, primary caregiver, education level, residence, social support systems, and food/financial insecurity. PHQ-9 scores pre- and post-intervention were assessed.

A paired *t*-test was applied to compare the baseline and final PHQ-9 scores of the same patients over time and check if different sociodemographic variables had a significant impact on the PHQ-9 score. Data analysis was done using STATA version 17.0. Data handling and reporting

procedures adhered to the tenets of the Declaration of Helsinki. Data extraction for this study was approved by the Audit Protocol for the Baylor College of Medicine (BCM) Children's Foundation in Eswatini (code H-25403, Board Reference number FWA 00,026,661/IRB 00,011,253) with ethical approvals/waivers obtained from the Eswatini Human Health Research Review Board (EHHRRB), the Baylor College of Medicine — Eswatini Institutional Review Board, and the Baylor College of Medicine (Houston, TX, USA) Institutional Review Board.

A retrospective analysis of PHQ-9 scores of ALHIV (10–19 years) was conducted by utilizing abstracted EMRx data at the BCMCFE. ALHIV who received mental health screening or a mental health intervention during the COVID-19 pandemic between March 2020 and January 2022 were included. Incomplete charts were excluded. Data extraction was done retrospectively using standardized structured query language (SQL) scripts. The abstracted data included age, gender, primary caregiver, level of social support, and significant triggers for mental disorders. We also reviewed data on diagnosis, management plans, treatment duration, and patient outcomes measured as PHQ-9 scores before and after treatment. Sociodemographic factors like education level, rural versus urban residence, and the presence of food or financial insecurity were documented.

Results

Comparison of numbers of ALHIV who accessed psychosocial interventions pre- and post-COVID-19 is summarized in Figs. 2, 3, and 4. The data depicts a reduction in outreach activities, treatment literacy, and external referrals to psychologists, most likely due to travel restrictions. Few ALHIV were referred for nutritional support. With a transition to telephonic peer support platforms, numerous ALHIV accessed peer education and social work services.

A total of 86 EMR charts were reviewed of ALHIV between 10 and 19 years who exhibited symptoms of depression and were offered PHQ-9 diagnostic testing between March 2020 and January 2022. The clinical presentation of ALHIV with mental disorders ranged from psychosomatic symptoms such as abdominal pain, chest pain, and diarrhea, to behavioral problems or suicidal ideation, as depicted in Table 1 and Fig. 5. Female ALHIV presented with a broader spectrum of mental disorders and psychosomatic symptoms than male ALHIV. These adolescents exhibiting adverse mental health symptoms were placed into seven categories of mental health disorders as shown in Fig. 6. There were 49 ALHIV (57%) who presented with multiple mental disorders. The most prevalent mental disorders were mood disorders ($n=55$), disruptive behavioral disorders ($n=13$), and anxiety disorders ($n=7$).

Fig. 2 Number of ALHIV referred for psychosocial interventions pre-COVID-19 (2019) and post-COVID-19 (2021) at Baylor Eswatini

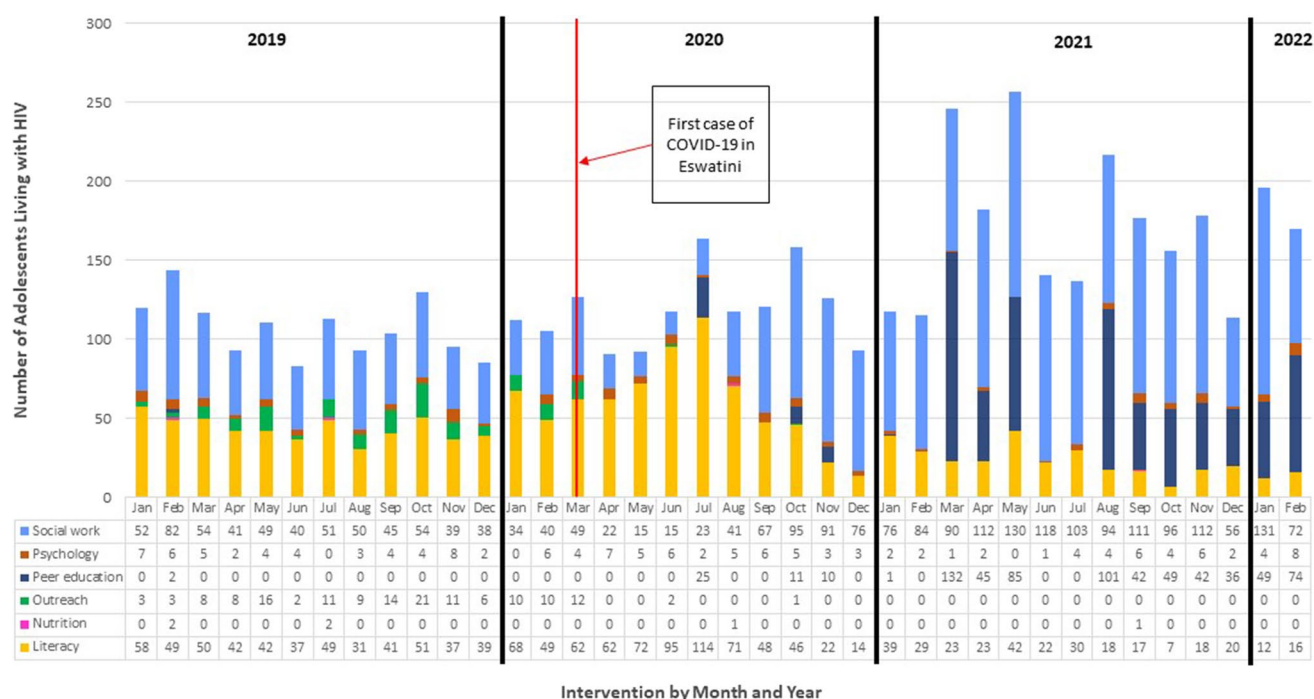
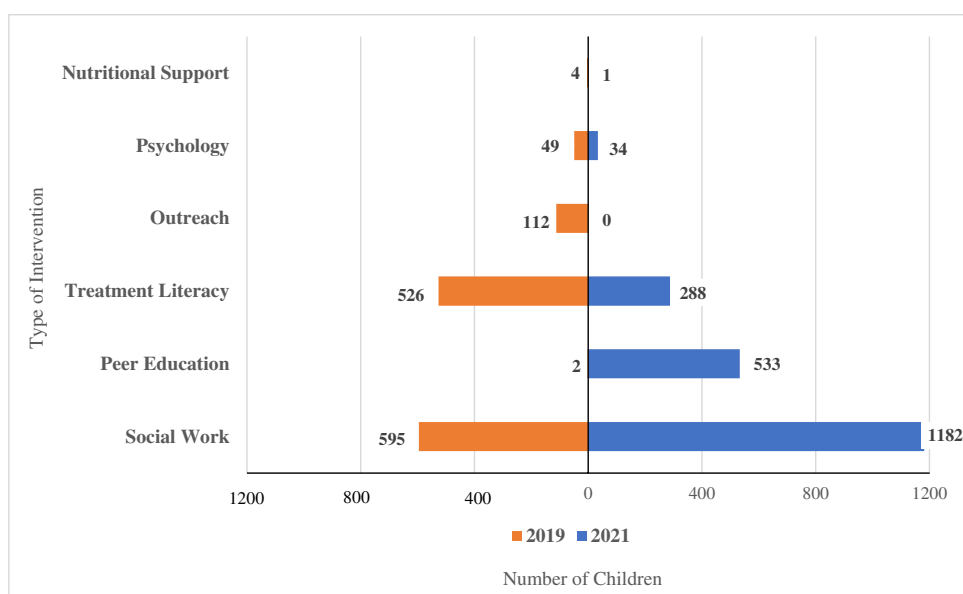


Fig. 3 Monthly trends between January 2019 (pre-COVID-19) and February 2022 (post-COVID-19) in the numbers of ALHIV referred for psychosocial services at Baylor Eswatini

We assessed the associations between depressive symptoms documented during the COVID-19 pandemic and sociodemographic factors. The descriptive statistics in Table 2 depict the mean age and extracted sociodemographic

variables versus PHQ-9 scores of ALHIV following application of a paired *t*-test. The mean age of ALHIV was 17.1 years ($n=86$). There was a statistically significant difference in mean PHQ-9 scores pre- and post-intervention

Fig. 4 ALHIV referred for psychosocial services by year at Baylor Eswatini. There was an increase in the total number of ALHIV referred for psychosocial services from 1288 adolescents in 2019, to 1425 adolescents in 2020, to 2038 adolescents in 2021

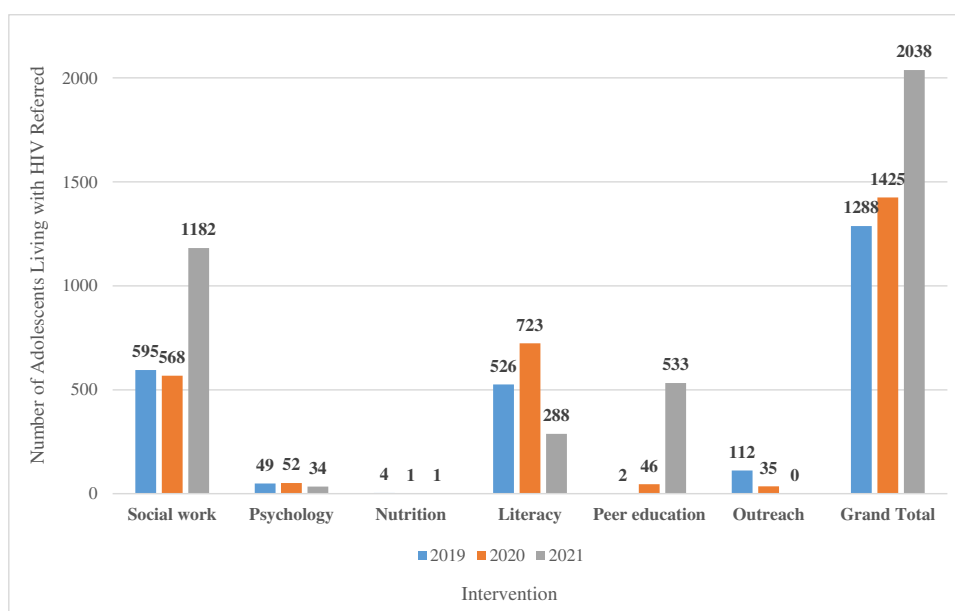


Table 1 Clinical diagnoses and symptoms which manifested from the mental illnesses of ALHIV at Baylor Eswatini

Diagnosis or predominant symptom	Female	Male	Total
Abdominal pain	1	0	1
Anxiety	5	2	7
Behavioral difficulties	4	3	7
Bipolar affective disorder	2	0	2
Chest pain	1	0	1
Diarrhea	1	0	1
Drug abuse	1	1	2
Depression: mild	7	1	8
Depression: moderate	6	7	13
Depression: moderately severe	6	5	11
Depression: severe	5	5	10
Psychosis	0	4	4
PTSD	2	0	2
Rebelliousness	1	0	1
Suicidal attempt	2	0	2
Suicidal ideation	7	2	9
Uncontrolled rage and anger	1	4	5
Grand total	52	34	86

The bold entries indicate the total numbers of females, total numbers of males and grand total

(16 vs 7, p -value 0.0017). Social support ($p=0.0153$) and education level ($p=0.047$) had a significant impact on development of depression among ALHIV.

We applied numerous strategies in the management of ALHIV who presented for medical care of mental disorders. As depicted in Table 3 below, these strategies included internal and external expertise. We offered psychotherapy,

pharmacotherapy, linkages to peer support, anger management, and the InReach program as part of our integrated package of care. InReach home visits are done by a clinic social worker and are aimed at intensified psychosocial support and improved retention to care. Some ALHIV were referred to psychologists/psychiatrists at external facilities. For medicolegal cases, a police report was filed.

Treatment outcomes for ALHIV were computed as their PHQ-9 score at 22-months post-intervention, compared to those at baseline. Measures of improvement were reductions in PHQ-9 scores and subjective reports of improvement. Our results demonstrated that there was a statistically significant difference in mean PHQ-9 scores pre- and post-intervention (16 vs 7, p -value 0.0017), as illustrated in the box plot in Fig. 7.

Discussion

In this cohort of 86 ALHIV, we demonstrate that the etiology of mental health problems in this age group is complex and multifactorial. We found that the degree of social support and the education level of ALHIV had a significant impact on their PHQ-9 score. Contrary to the initial hypothesis, sociodemographic factors such as food/financial insecurity, characteristics of their primary caregiver, and rural/urban residence had no significant impact on the PHQ-9 scores of ALHIV. This finding differs from published literature [4••] and likely occurred due to systems in place at BCMCFE that provide equitable food and financial support for ALHIV.

Our findings were consistent with those reported elsewhere; one or more of the following events triggered the onset of mental disorders among ALHIV: bullying at school,

Fig. 5 Clinical diagnoses and psychosomatic presentation of mental disorders among ALHIV at Baylor Eswatini by gender

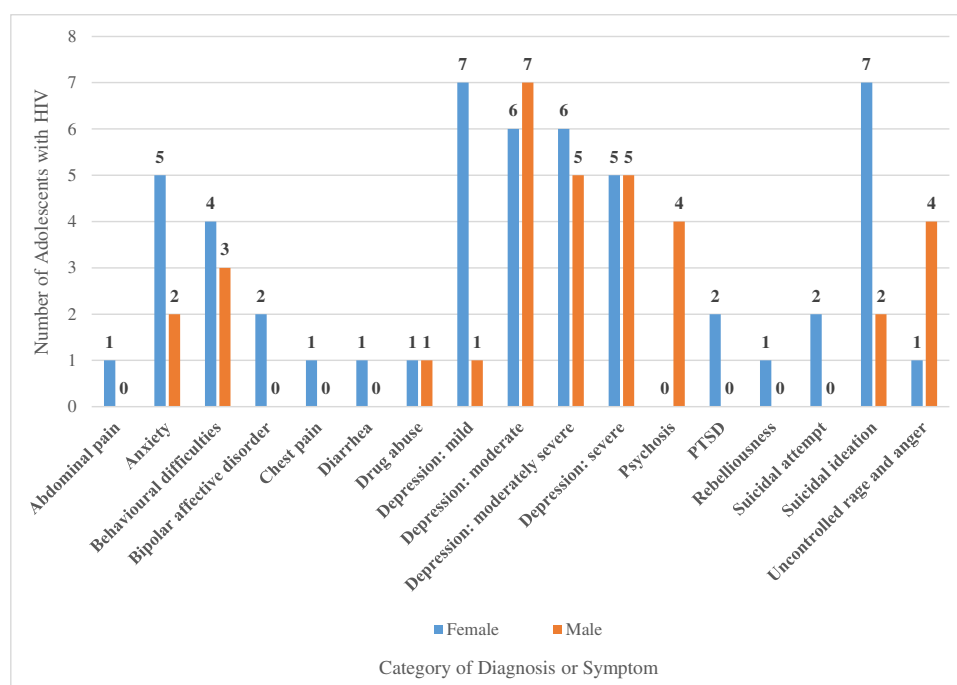
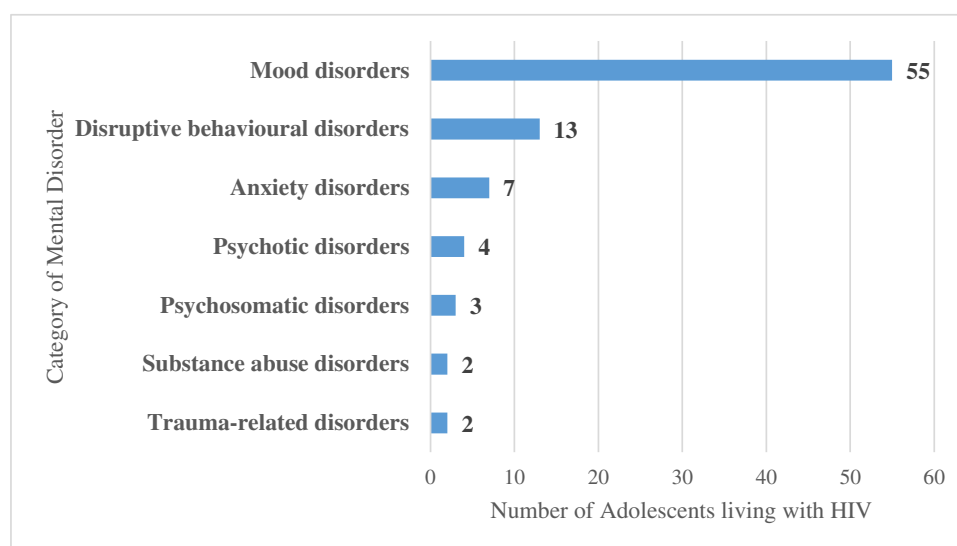


Fig. 6 Categories of mental disorders among ALHIV from March 2020 to January 2022 identified from retrospective chart review. The most prevalent mental disorders were mood disorders ($n=55$), disruptive behavioral disorders ($n=13$), and anxiety disorders ($n=7$)



social stigma, an underlying disability, failing of exams, physical or verbal abuse, acute traumatic events (e.g., a car accident, rape), and denial about their HIV status or non-disclosure of their HIV status while dating [31]. Mental illness among ALHIV manifested as mood disorders, anxiety disorders, disruptive behavioral disorders, psychotic disorders, trauma-related disorders, substance abuse disorders, and psychosomatic disorders. Psychosomatic symptoms included chest pain, diarrhea, and headache. Of concern was the degree of overlap between psychosomatic manifestations of mental disorders and COVID-19 screening symptoms. There may have been missed opportunities for diagnosing

ALHIV with mental health disorders if they screened positive for COVID-19 with these symptoms, following the clinical flow algorithm.

We share best practices, which resulted in reduced PHQ-9 scores and improved coping mechanisms for ALHIV during the COVID-19 pandemic. Our multidisciplinary teams developed intentional systems to expedite clinic transit time and increase mental health screenings among ALHIV. This was done in order to support their resilience and promote wellness through routine screening, treatment for depression, teletherapy, and enrolment into adolescent peer-support groups that adhered to national standards for gatherings during the COVID-19 pandemic. Other

Table 2 The impact of sociodemographic variables on the PHQ-9 scores of ALHIV in Eswatini

Sociodemographic variables	PHQ-9 score ^a				
	<i>n</i> = 86	Mean	(95% conf. interval)	%	<i>p</i> -value
Age range					0.8972
10–14	13	15.77	10.9088–20.62966	15.1%	
15–19	73	16.08	14.21211–17.95227	84.9%	
Gender					0.1611
Male	34	17.53	14.89692–20.1619	39.5%	
Female	52	15.06	12.78494–17.33044	60.5%	
Primary caregiver					0.863
Biological	45	16.18	13.75621–18.59935	52.3%	
Non-biological	41	15.88	13.36164–18.39446	47.7%	
Education level					0.047*
Secondary	84	16.3	14.59292–18.00232	97.7%	
Tertiary	2	5	45.82482–55.82482	2.3%	
Residence					0.7875
Rural	61	15.89	13.63297–18.13753	70.9%	
Urban	25	16.4	14.08022–18.71978	29.1%	
Social support					0.0153*
High	12	21.17	15.28176–27.05157	14.0%	
Low	74	15.2	13.46812–16.93729	86.1%	
Food insecurity					0.3151
No	32	14.91	13.11556–16.69694	37.2%	
Yes	54	16.7	14.16826–19.23915	62.8%	
Financial insecurity					0.3209
No	26	14.73	12.6663–16.79524	30.2%	
Yes	60	16.6	14.29769–18.90231	69.8%	

^aPHQ-9 score ranges from 0 to 27. A PHQ-9 score between 0 and 4 indicates none to minimal depression. A PHQ-9 score between 5 and 9 indicates mild depression. A PHQ-9 score between 10 and 14 indicates moderate depression. A PHQ-9 score between 15 and 19 indicates moderately severe depression. A PHQ-9 score between 20 and 27 indicates severe depression [30].

*Denotes *p*-value of < 0.05

Table 3 Strategies used in the management of mental disorders in ALHIV

Treatment	Female	Male	Total
Anger management	0	2	2
InReach	0	1	1
Partial disclosure	0	1	1
Pharmacotherapy	10	8	18
Police case report	1	0	1
Psychotherapy	31	16	47
Referred to psychiatrist	2	4	6
Referred to psychologist	6	2	8
Teen club	1	0	1
Peer support	1	0	1
Grand total	52	34	86

The bold entries indicate the total numbers of females, total numbers of males and grand total

interventions utilized included InReach, face-to-face psychotherapy, pharmacotherapy, anger management, and referral for review by psychologists and psychiatrists.

Limitations to this study include different prescriber practices in documenting or referring patients for mental health screening or treatment. For instance, some prescribers would document that depression screening was done but omit the PHQ-9 score. Others referred ALHIV with adverse mental health to social workers, who are more readily available at the clinic, without documenting it as a “psychology” intervention. Hence, these cases could not be pulled from the EMRx during the chart review. We also had a paucity of child psychologists, and we did not have standardized tools for measuring depression among adolescents such as the Beck Depression Inventory (BDI) and the Social Problem-Solving Inventory-Revised (SPSI-RTM). In addition, unlike follow-up for HIV-positive patients, there was no structured method for follow-up of ALHIV who were diagnosed with mental disorders. We

Fig. 7 Box plot depicting improvement in PHQ-9 scores following treatment for depression in ALHIV at Baylor Eswatini



relied on their scheduled antiretroviral therapy refill dates to conduct mental health follow-ups. The small sample size was also a limitation.

Implications: Next Steps and Areas for Future Research

The mental health of ALHIV was significantly affected by the COVID-19 pandemic. Urgent interventions are needed to address increasing cases of anxiety and depression for these adolescents. Of utmost priority are increasing measures to equip them with coping skills and improve their resilience. A coordinated effort is needed to develop long-term, sustainable strategies that will target the continuity of education and prevent school closures during future emergencies. We hope that future research initiatives will prioritize age-centric innovations to increase the access of mental health services to ALHIV, strengthen their interpersonal support systems, and advocate for policies to ensure that they have access to uninterrupted education. These initiatives will enable them to attain their full potential of living safe and healthy lives despite unpredictable external dynamics, such as the next global pandemic.

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Declarations

Ethical Approval and Consent to Participate Not applicable.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

Conflict of Interest The authors declare no competing interests.

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