


# Implementation of a Psychosocial Support Intervention for Adolescents on Antiretroviral Treatment: Challenges and Experiences from Ehlanzeni District, South Africa

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## Abstract

Adolescents living with HIV (ALHIV) need support from family, peers and health workers to remain on antiretroviral therapy and achieve and sustain viral suppression. This paper qualitatively explores the implementation of a psychosocial support intervention (PSS) in five primary health care facilities in the Ehlanzeni district, South Africa. Data were collected through key informant interviews and focus group discussions with ALHIV on ART. Data analysis employed inductive thematic analysis. Informed consent was obtained prior to all data collection. The PSS intervention facilitated full disclosure of HIV status to adolescents, supported treatment adherence through health education, peer support, health care provider- and client relations, and quick access to health service delivery. However, COVID-19 restrictions and regulations challenged the implementation of the intervention. The PSS intervention showed promise to support adolescent's adherence and retention in care. We recommend innovative approaches to account for systemic disruptions, as evidenced by the COVID-19 pandemic.

## Keywords

adolescents living with HIV, psychosocial support, HIV, AIDS, adherence, retention

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## Introduction

In 2017, the South African National HIV prevalence for all age groups was estimated at 14%; translating to an estimated 7.9 million people living with HIV.<sup>1</sup> Adolescents and young children represent about 10.4% of the people living with HIV. It is widely reported that adolescents are less likely to adhere to antiretroviral therapy (ART) and remain in care compared to adults and younger children.<sup>2</sup> A study conducted in the Eastern Cape, South Africa, reported lower rates of ART adherence (27-90%) among adolescents (10-19 years old) compared to children and adults.<sup>2</sup> Similarly, a cohort study in Southern Africa found that adolescents are less likely to adhere to ART and have lower rates of virological suppression and immunologic recovery, and a higher rate of virological rebound after initial suppression, compared to adults.<sup>3</sup> Low ART adherence rates have been attributed to adolescents being less informed about HIV and the benefits of adherence<sup>4</sup> and lacking motivation to follow instructions of the treatment regimen.<sup>5</sup>

Evidence suggest that ALHIV may suffer from depression and anxiety symptoms, which are associated with lower adherence to ART and higher substance abuse and risky sexual behaviours.<sup>6</sup> Interventions to improve medication adherence among ALHIV should target the cognitive, emotional and

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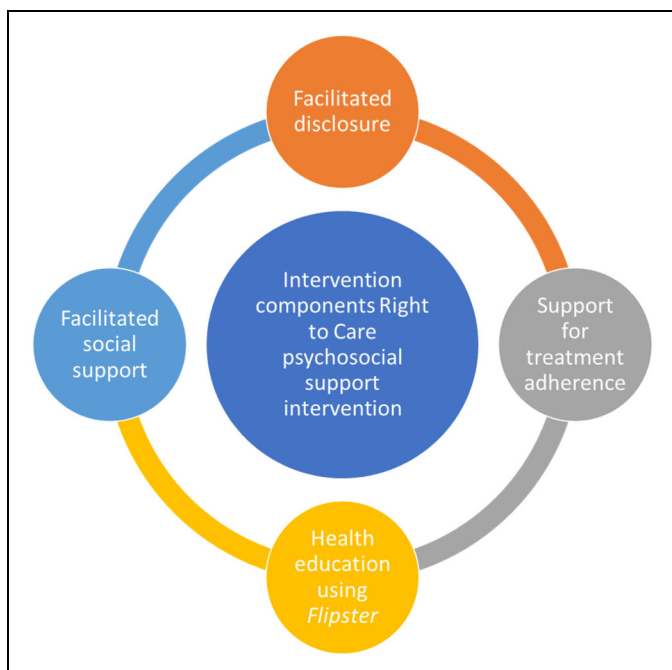
behavioral aspects of the chronic condition (HIV) as well as the developmental life stage (adolescence).<sup>7</sup> Psychosocial support interventions designed to address common mental health issues among ALHIV showed improvements in their emotional and behavioral well-being, self-esteem, coping skills, and social wellbeing.<sup>6</sup> It is argued that ALHIV with improved cognitive and emotional behaviors are more likely to adhere to ART treatment and be retained in care.<sup>8</sup>

There is a burgeoning call for psychosocial support intervention to improve adherence and retention in care among ALHIV.<sup>9–11</sup> While psychosocial interventions for HIV-affected adults have shown high impact to adherence and retention in care,<sup>10</sup> fewer studies have reported little to moderate impact of psychosocial intervention on adherence and retention in care among ALHIV. The implementation process of psychosocial interventions among ALHIV are even less reported.<sup>9</sup> The aim of this paper is to report on the implementation of a psychosocial support intervention designed to improve adherence and retention of ALHIV on ART in Ehlanzeni District in Mpumalanga province, South Africa.

## Methods and Materials

### Study Setting

According to the 2017 National HIV prevalence, incidence, behavior and communication survey, the Ehlanzeni District has the second highest HIV prevalence in South Africa with an estimated prevalence rate of 17.3%. The Ehlanzeni District Municipality is in the north-east of the Mpumalanga Province. The study was conducted in five public primary



**Figure 1.** Intervention Components of the Right-To-Care Psychosocial Support Intervention.

health care facilities, namely Buffelspruit clinic, Kanyamazane CHC, Cunningsmore clinic, Langloop CHC and Naas CHC. Our baseline study in the Ehlanzeni district found a 74% viral suppression rate (confidence interval: 73.1%-74.8%) among ALHIV on antiretroviral treatment in 2019,<sup>12</sup> and retention in care rates at 6, 12, 18 and 24 months of 90.5%, 85.4%, 80.8% and 76.2%, respectively<sup>13</sup> – which fail to meet the UNAIDS target of 95%, 95%, 95% by 2030.

### Overview of the Right to Care Psychosocial Support Intervention

Right to Care (RTC) is a registered South African Non-Governmental organization (NGO) that provides quality health care services including prevention, treatment care and support services for people living with HIV. RTC developed a PSS intervention consisting of adolescent and youth-friendly services that aim to improve adherence and retention to ART care among ALHIV. The comprehensive PSS intervention package consists of services to address disclosure, treatment adherence, social support and HIV treatment literacy<sup>8</sup> as illustrated in Figure 1.

### Research Design, Sample Size and Sampling

We applied a qualitative descriptive research design. Five purposively selected key informants comprising a program coordinator, two professional nurses and two community system technical officers (CSTO) were interviewed for the study. Twenty-four focus group discussions were conducted with 173 ALHIV (10–19 years old) on ART who received the psychosocial support group intervention in five public primary health care facilities in Ehlanzeni District.

### Data Collection Procedure

We reviewed program documents including adolescents and youth friendly space policies and guidelines, implementation plan and the *Flipster* training manual.<sup>8</sup> The focus group discussions were conducted between 1 and 30 November 2021, and the key informant interviews were conducted between 3 and 10 December 2021. Before starting the key informant interviews, the program coordinator and implementers were briefed on the purpose of the interviews and interview dates were scheduled with the potential key informants.

Through the support of clinic professional nurses, parents/caregivers of ALHIV were contacted and briefed on the focus group discussions. Consent was also sought from the parents/caregivers of the ALHIV and assent from ALHIV who were under 18 years old. The key informant interviews were conducted virtually (through Microsoft Teams meetings) in English and voice recorded. The focus group discussions were conducted in person and in the local language (Tsonga). Recorded data were translated verbatim in English and prepared for analysis.

## Data Analysis

From the program documents, we identified the four program objectives, and use these (program objectives) as a framework to organize the data. Data within this framework were analyzed manually using inductive content analysis. The inductive content analysis technique is suitable for analyzing qualitative data collected without the guidance of a theoretical framework, but deriving purely from emergent data and formulating themes.<sup>14</sup> A fifth category (Other challenges) was formed to capture the themes that did not fit into the program objectives framework, but captured “Other challenges” encountered in the implementation of the intervention. Data were captured in an Excel table with five columns to depict categories, themes, subthemes, codes and direct quotations. We developed codes from the responses provided by the participants. Data codes were reviewed by the authors and later organized into subthemes, themes, and categories (pattern coding). We further read and cross-checked the transcribed data to confirm the developed pattern coding. A final matrix containing columns for categories, themes, subthemes, and codes was developed using Microsoft Excel 2016.

## Rigor and Trustworthiness

The rigor and trustworthiness of the study findings were ascertained by doing the following. (1) We conducted a pilot of the interview guide, which helped us assess the type of information that we asked were likely to produce. (2) We applied the processes of information triangulation, which entailed using more than one stakeholder group - key implementers and adolescent beneficiaries. (3) We conducted iterative questioning in data collection dialogues with the study participants. Conducting a document review provided us with relevant concepts and theories to engage with the study participants. (4) Trustworthiness was enforced by actively searching for disconfirming evidence through negative case analysis<sup>15</sup> or deviant case analysis,<sup>16</sup> and keeping an audit trail. Finally, we followed the relevant aspects of the Criteria for Reporting Qualitative Research (COREQ) outlined by Tong et al<sup>17, 18</sup>

## Ethical Approval and Informed Consent

Ethics clearance was obtained from the University of the Western Cape Biomedical Research Ethics committee (BM19/1/8) and the National Health Research Ethics committee (MP\_202102\_006). We adhered to the 1964 declaration of Helsinki guidelines. The researchers sought verbal and written consent from all study participants, including parents/caregivers. Pseudonyms were also used to identify study participants during key informant interviews (KII's) and focus group discussions (FGD's). In addition, participants consented to publishing of their responses if they were kept anonymous.

## Results

The objectives of the PSS program were to facilitate and support disclosure, optimizing treatment effectiveness, and providing health education and social support to improve adherence and retention in ART among ALHIV. The themes, subthemes and codes derived as aligned with each of these program objectives are illustrated in Table 1.

### Disclosure Support

One of the primary objectives of the PSS intervention was to facilitate and support “full” disclosure of HIV status to adolescents on ART safely and healthily. According to the 2016 South African National Department of Health disclosure guidelines for children, “full” disclosure should be conducted gradually regarding the cognitive development and maturity of the child and adolescent. The intervention disclosure process started with auditing the files of ALHIV on ART to determine whether they have received “full” disclosure.

### Partial Disclosure

The PSS intervention through trained health care workers provide a gradual disclosure process starting from partial disclosure (where the adolescents are taught about germs) to full disclosure (the adolescents are taught about HIV and consequences of non-adherence to ART). The intervention implements partial disclosure between ages 4 and 9 years old, where the ALHIV are told that they have germs in their body and will need medication to fight the germs. This information is given because at this age, the child can comprehend germs as opposed to HIV as a virus. The knowledge of germs in the body provides the child with a reason to continue to take ARV drugs daily.

It [disclosure] was not easy at first, because they did not understand why they should take the treatment every day. Because most of them even were not told the truth about the treatment. They knew that they were taking medicine. [but] they did not really understand why they should take the treatment every day - Professional nurse, Kanyamazane CHC

### Full Disclosure

After the partial disclosure, “full” disclosure is provided to the adolescent when they reach 10 years of age. At this age, the adolescents are considered to be mature enough to take their medication on their own (ie, learn self-management of their chronic condition). In this session, they are told about the virus, its consequences to the body, and how to manage their chronic illness. Full disclosure of HIV status is done with the support of a parent or guardian.

...So, from ten years upward we expect that the child should know that they have got a virus. But we need to do that through the parents, the parents of the kids must give their consent” – Community system technical officer, Langloop CHC

**Table I.** Themes, Subthemes, and Codes by Program Objectives.

| Program objective  | Theme  | Subtheme  | Codes  |
|--|--|---|--|
| Facilitate disclosure of HIV status to adolescents             | Disclosure support   | Audit of disclosure status  | Partial disclosure<br>Full disclosure  |
|  |  | Involvement of caregivers in disclosure process                       | Reluctance of caregivers<br><br>Parents not ready for their children to know the type of treatment they are on<br>Fear of being blamed for infecting the child |
| Optimizing treatment   | Adherence support  | Routine viral load monitoring   | High viral load  |
|  |  | Enhanced adherence counseling   | Non-adherence  |
| <b>Flipster Educational intervention</b>                       | Regimen switching<br>Self-management of ART                                | Regular monitoring of adolescents' weight                             | Under dosing of ARVs   |
|  |  | Resistance testing  | Increased pill burden  |
|  |  | Treatment literacy  | Knowledge and management of HIV and consequences to the body<br>Challenges to medication intake  |
|  |  | Addressing adherence challenges faced by ALHIV                        | Phone alarm reminders  |
|  |  | Regular reminder strategies   | Using a marker, eg, TV drama reminders<br>Home support   |
| Strengthen adherence support network                           | Strengthened support network   | Support from parent/caregiver   | Bonding with peers<br>Clinician-client interaction   |
|  |  | Support from peer educators   |  |
|  |  | Support from health workers (clinicians)                              |  |
| Other challenges in the implementation of the PSS intervention | Ease of accessing ARVs   | Quick access to ARVs at facility                                      | Reduced waiting time<br>Bonding with clinician   |
|  |  | Family support for adherence  | More than one person in the house taking ARVs  |
|  | Staff challenges   | Capacitation issue  | Continuous training of peer educators and professional nurses  |
|  |  | Dedicated staff to support ALHIV                                      | Shortage of trained staff on disclosure  |
|  |  | Competing workload  | Juggling between tasks<br>Juggling between COVID-19 and other tasks  |
| Perceived effect of COVID-19                                   | Program implementation disruption caused by COVID-19                       |   | Barriers to scaling up and implementation<br>Challenges with medication pick up at a facility  |
|  |  |   | Lacking understanding  |
| Individual constraints to medication adherence                 | Perceived lack of knowledge on HIV status<br>Missed support group sessions | Lack of understanding the reason for ART uptake<br>Financial barriers | Lack of money for transport  |

The second step in the intervention process is to contact parents or caregivers and invite them to the clinic to facilitate "full" disclosure to the adolescent.

I make sure that after doing the audits, I call the parents [of ALHIV] and inform them [parents] I have got this child that is not disclosed. So how about you come to the facility, so we start with the child's disclosure? – Community system technical officers, Kanyamazane CHC

### *Reluctance of Caregivers to Disclose to Their Children*

It was reported by program implementers that some of the parents/caregivers are reluctant to participate in the disclosure

process because they are not comfortable for their children to know their HIV status, for fear that they may be blamed for infecting their child.

One parent said she was not ready for the child to know what kind of treatment he was taking. That came from a place of her fearing that the child would blame her. And I think because she blames herself; ...she feared that the child was also going to blame her for infecting him with HIV - Community system technical officers, Kanyamazane CHC

In the focus group discussions, the adolescents expressed that the intervention helped provide clarity on the reason for

their continuous medication intake and helped them come to terms with their HIV status and subsequently adhere to taking their medication.

When they told me I was not shocked, but I became aware when they told me. I was first told that the treatment was for flu, but I wondered why I have flu this long and not getting better. But then they eventually told me it was for HIV - 14-year-old male, Kanyamazane CHC

Now I am happy because I know my status unlike not knowing that I am HIV positive. I feel free now because I know my status-18-year-old female, Kanyamazane CHC

Adolescents who were perinatally infected with HIV lacked understanding of continuous medication intake. Full disclosure is a key component of the PSS program to provide clarity on the need for adherence, and a criterion for recruiting the ALHIV into adolescent support groups. The disclosure component of the intervention was implemented as planned, and it provided clarity for the ALHIV on their continuous ART intake, enhanced their ability to take responsibility for their medication intake; and subsequently improved medication adherence.

### *Optimizing Treatment*

The PSS intervention provides treatment adherence support for ALHIV through four mechanisms, namely: routine viral load monitoring, enhanced adherence counseling (EAC), regular monitoring of adolescents' weight, and resistance testing leading to switching to a second-line regimen.

### *Routine Viral Load Monitoring*

The intervention enables the routine monitoring of viral load of ALHIV every six months and once a year if the ALHIV on ART have achieved two successive viral load suppressions to ensure adherence to ART. However, for adolescents with a history of non-adherence or missing clinic appointments, blood is drawn every two months to ensure adherence before reverting to the routine of six months, and once a year.

We collect the viral load when the patient is due for blood, and when I notice that the viral load is high, then counsel them [ALHIV]...after two months I will collect blood again to see if the viral load is going down. If the viral load is not going down, we then switch to second line - Professional nurse, Langloop CHC

### *Enhanced Adherence Counseling*

Through the intervention, enhanced adherence counseling (EAC) is provided to ALHIV who defaulted on clinic appointments and have a viral load >1000 copies/ml. The main goal of the counseling is to help the adolescents overcome the barriers to

adherence and regular clinic visits, and to re-engage with treatment regime.

When I noticed that the viral load is high, I will seat with the patient [adolescent] and talk to them to understand the problem for not adhering. If the patient [adolescent] is not adhering I will ask them why they are not adhering [provide EAC] - Professional nurse, Kanyamazane CHC

### *Regular Monitoring of Adolescent's Body Weight*

The PSS intervention provides regular monitoring of adolescents' body weight. Regular monitoring of body weight gains/losses is vital to maintaining appropriate antiretroviral (ARV) dosage for the ALHIV. The 2019 adherence guideline for HIV, Tuberculosis (TB), and non-communicable diseases (NCDs) recommended a specific regimen for a specific weight in ALHIV.<sup>19</sup> Under-dosing of ARVs due to adolescents' rapid growth was commonly observed as a reason for unsuppressed viral load among ALHIV.

Most of them their viral load was very high, but when I check their file, most of them were under dosed. Because they are kids, they grow every now and then. What I noticed is that the nurses will not update their treatment according to the weight of the child, so I correct it - Professional nurse, Kanyamazane CHC

### *Resistance Testing*

ALHIV whose viral load remain unsuppressed after receiving counseling were switched to a second-line regimen if the unsuppressed viral load persisted. In the focus group discussions, the adolescents expressed that blood was taken for testing to monitor whether they (ALHIV) were adhering to their treatment.

They do blood check to see if we are taking our ART when at home. It [regular blood checks] assisted us to collect our ART regularly -14-year-old female, Langloop CHC

The adolescents also recounted how the counseling they received for not adhering to their treatment helped them to re-engage with their treatment.

I would get sick, and they found out that I was not taking my pills and they admonished me for not doing that and I was told these pills will help me live and I continued taking them. They also said I should always eat my food so by the time I take my pills I have something in my stomach and that I should drink a lot of water. So, I took that and continued up until now - 13-year-old male, Kanyamazane CHC

Through regular monitoring of their viral load and weight and providing enhanced adherence counseling to these adolescents, those on ART were supported in their treatment journey to attain viral suppression.

## Health Education

The intervention provided health education to ALHIV using the *Flipster* training manual. The *Flipster* training manual consists of discussion topics covering HIV knowledge and treatment literacy, treatment adherence, disclosure, stress and mental health management, self-esteem, nutrition and substance abuse. Additionally, the tool consists of two sides-on one side of the tool (seen by participants) comprises descriptive pictures; while the reverse side provides guides for the facilitator through the topic in a series of easy-to-follow steps.

## Treatment Literacy

The *Flipster manual* contains age-appropriate training materials on treatment literacy, HIV knowledge, nutrition, drugs and substance abuse, and medication adherence strategies with picture codes showing illustrations of the topics under discussion. The *Flipster manual* facilitates the process for adolescents in the support groups to talk openly about sexual and reproductive health concerns while opening pathways for discussions about HIV, stigma and life challenges. This approach keeps ALHIV interested and engaged in the topics discussed.

The health education that they [ALHIV] receive when they are in the facility to receive their treatment, is tailored in such a way that it does not push them [ALHIV] away, but rather make them [ALHIV] want to come to the facility because it is a place where they [ALHIV] can actually get answers, get to understand certain things they might not be able to understand from their parents - Program coordinator

## Self-Management of ART

Adherence reminder strategies, such as phone alarm, reminders and TV shows were suggested to adolescents to help them remember to take their medication daily.

Also, we tell them [ALHIV] that when Generations plays- we must take our treatment and we both take it together so creating that kind of cultures and behavior in the home can be really a form of support - Community system technical officer (1), Langloop CHC

We always tell parents to someone who is on treatment to make sure that there is a phone alarm - Community system technical officer, Kanyamazane CHC

According to one of the professional nurses, these strategies mentioned above were observed to be effective in ART self-management among ALHIV.

I think they [ALHIV] were able to take care of themselves, knowing that they [ALHIV] should take treatment every day. I would ask them "what time do you take treatment"? they [ALHIV] knew the time they [ALHIV] should take treatment. The fact that they could adhere to the time and the treatment, I think that they were

able to take care of themselves - Professional nurse, Kanyamazane CHC

In the focus group discussions, the adolescents expressed that they (ALHIV) were better placed to take ART seriously by freely discussing their challenges with facilitators and peers.

We should continue with the group because it helps. And we learn from each other, and it becomes easy for us to meet and collect our ART -13-year-old female, Langloop CHC

Similarly, the ALHIV expressed the benefit of TV programs in reminding them that it is time to take their medication.

Television also helps, like I know every time generations plays on TV it automatically reminds me to take my ART-13-year-old, male Langloop CHC

The adolescents also recounted how they could take responsibility for their health and get all reminders from family members. For example, one adolescent reported that:

I am taking responsibility of my health and I remind myself every time and even my little sister does remind me and if I don't take, she would even report to my mom. So, I thank her a lot she is always there to remind me - 18-year-old female, Kanyamazane CHC

The *Flipster* educational component of the intervention enabled a conducive environment for the ALHIV to discuss crucial topics on HIV treatment literacy and address challenges to medication adherence.

## Social Support

The aim of the PSS intervention is to facilitate social support for improved access to ART (medication pick up and clinic attendance) and retention in care by strengthening the ALHIV's support networks.

## Strengthen Adherence Support Network

The PSS intervention is implemented in an adolescent-friendly and safe space in the clinics. The support groups provide an enabling environment for ALHIV to bond with clinicians, peers in the PSS group and their caregivers throughout their treatment journey.

The peer educators are very young. So our young people and our children can relate with them and don't feel intimidated. I think it has done good for our program -Community system technical officer, Kanyamazane CHC

Their [ALHIV] interactions with me was very good. They [ALHIV] were open enough to interact with me, like they [ALHIV] knew that everything was fine when they [ALHIV] are at the clinic, they [adolescent] feel safe, they [adolescent] can say anything that they [adolescent] are facing - Professional nurse, Kanyamazane CHC

Caregivers of ALHIV are encouraged to take their medication together with their children as role models and as such motivate their children to adhere to treatment.

We always encourage parents/caregivers in the disclosure sessions to take treatment with the child because that always help[s] them to see, okay, mummy always does it, so I can do it too - Community system technical officer, Langloop CHC

### *Ease of Accessing Antiretroviral*

The PSS intervention provides ALHIV with quick access to ARVs at the clinic, so that they have reduced waiting times when they visit the clinic.

And the fact that it was welcoming for them [ALHIV] to come to the clinic, they [ALHIV] did not have to stay in long queues in the clinic. They [ALHIV] come to me [professional nurse] and I help them with their medicines and have sessions with them [ALHIV], and after an hour they [ALHIV] leave. It is not like sitting on the benches waiting for their medicine - Professional nurse, Langloop CHC

During the focus group discussions, most adolescents expressed a sense of belonging and camaraderie with peers on their HIV journey. The sense of belonging and camaraderie made them forget about their fears, hurt, worries, anger and bitterness.

What I like about the group is that I met friends who are also taking ART –14-year-old, female Kanyamazane CHC

We help one another by encouraging each other to take medication every day - 13- year-old female, Langloop CHC

### *Other Challenges in the Implementation of the PSS Intervention*

Although the psychosocial support intervention was implemented as planned with promising benefits, other challenges encountered in the implementation of the PSS intervention identified were due to staff's workload challenges, disruptions and restrictions due to COVID-19, as well as lack of transport [money] to attend support group sessions.

### *Workload Challenges*

Though the staff implementing the adolescent program were trained on disclosure and skills to facilitate adolescent support groups, consistently implementing it was a challenge because of competing workloads at the clinic.

Some people have been trained but are not implementing maybe because of some of the challenges with the workload. So is not always that people don't know what to do, but it is just that they

are not doing it because of other responsibilities that they have, so that is what I would say it is a challenge - Program coordinator

The community system technical officers also narrated how competing work demands had hindered the continuous implementation of the program especially with the emergence of COVID 19.

The workload also affected a lot, because we were short staffed, I could not continue with the support groups to attend to COVID cases-Community system technical officer, Langloop CHC

### *Impact of COVID-19 on Program Implementation*

The implementation of the program was severely disrupted by COVID-19 restrictions and lockdown regulations in South Africa. These restrictions and lockdown regulations led to the discontinuation of support group sessions; which hindered access to the health facility and medication pickup.

A huge disrupter for this implementation has really been COVID-19, because like I said previously, I had quite a few facilities that were implementing support groups, and the goal was to expand to more facilities so that we have more supports groups in more facilities - Program coordinator

...but because of COVID-19 restrictions, implementation of support groups came to a halt, as a result medication pickup among our children dropped - Professional nurse, Langloop CHC

### *Lack of Transport Money to Attend Support Groups*

Apart from the competing workload and COVID-19 disruptions and regulations, their lack of money for transport to the clinic hindered ALHIV from attending support group sessions.

The other challenge is transport, every time they [ALHIV] meet once in a month. You find that they [ALHIV] don't have money to come to the facility to attend the support group - Professional nurse, Langloop CHC.

The implementation of the PSS intervention was constrained because of the competing workload and COVID-19 regulations and restrictions.

## **Discussion**

In this study, we set out to qualitatively explore the implementation of a psychosocial support intervention designed to improve adherence and retention of adolescents on ART and the impact on ALHIV in the Ehlanzeni district. The intervention components were facilitated disclosure, support for treatment adherence, health education using the *Flipster manual*, and facilitated social support. We also reported on some constraints

encountered while implementing the psychosocial support intervention.

Evidence suggests that non-disclosure of adolescents' HIV status compromises adherence and retention in ART care among ALHIV.<sup>20</sup> "Full" disclosure is a crucial component of the psychosocial support intervention. The World Health Organization (WHO) recommends full disclosure of HIV-positive status to adolescents who acquired HIV perinatally by age of 12 years.<sup>34</sup> The evidence on the association between disclosure and adherence to ART among ALHIV are mixed. While a study found positive association between disclosure and adherence to ART among ALHIV,<sup>21</sup> another study conducted in the Eastern Cape province of South Africa observed that awareness of HIV-positive status was not associated with higher rates of adherence, or lower rates of viral suppression among adolescents.<sup>34</sup> In this study, disclosure provided through the PSS program is age-specific and culturally sensitive to proffer disclosure support to ALHIV and these ALHIV are subsequently recruited into the PSS support group. Through this disclosure approach, ALHIV are supported to accept their positive HIV status and are motivated to adhere to and remain engaged in ART.

Adherence monitoring requires approaches that effectively measure patient compliance, and at the same time, identify the non-compliant patients. While studies have assessed the effectiveness of indirect methods of measuring medication compliance such as viral load test, pill count, self-report and electronic monitoring devices.<sup>22</sup> WHO recommends viral load testing for monitoring people living with HIV on ART. Studies have reported that routine viral load monitoring and enhanced adherence counseling are effective in improving the viral suppression rate among people living with HIV.<sup>23, 24</sup> Nevertheless, no significant association has been found between enhanced adherence counselling and viral suppression among people living with HIV.<sup>25, 26</sup> We did not find any study that explores routine body weight monitoring in managing adherence among ALHIV. In the PSS intervention, support for treatment adherence was implemented through four mechanisms, routine viral load monitoring, enhanced adherence counseling for defaulting adolescents, routine body weight monitoring, and regimen switching for ALHIV who failed first-line treatment. Routine body weight monitoring helped identify adolescents on ART who were under dosed because of their rapid growth and then adjusted to correct ART dosage. Similarly, adolescents on ART who were resistant to the first-line regimen were timeously switched to a second-line regimen. These mechanisms are crucial to ensuring effective management of ALHIV adherence to ART.

We found the health education component of the PSS intervention to encompass several sessions that educate on psychological wellbeing, HIV knowledge, nutrition, drugs and substance abuse, and treatment literacy (importance of medication adherence),<sup>8</sup> which are posited to impact the immediate determinants to adhere to ART.<sup>27</sup> It is observed that people with lower health literacy were less likely to have undetectable viral load.<sup>28</sup> The intervention provides ALHIV with HIV

knowledge, treatment and management skills to alter negative attitudes and understand the benefits of sharing positive feedback with peers. Additionally, enhanced counselling is a mechanism used to motivate ALHIV to continue adhering to their medication.<sup>29, 30</sup>

The intervention utilized peer educators, and professional nurses to provide HIV treatment care and support for ALHIV, thus strengthening the relationship between treatment supporters/clinicians and ALHIV.<sup>8</sup> In addition, parents/caregivers are trained on how to support the ALHIV on their treatment journey.<sup>8</sup> Therefore, the network support provided to ALHIV is designed to improve their adherence and retention in ART care.<sup>8</sup> In some studies, it has been suggested that ALHIV who receive support from clinicians, peers, and caregivers improve their psychosocial wellbeing, which, in turn, improves adherence and retention in ART.<sup>31-33</sup> In addition, caregivers' support, support from peer educators and clinicians, and the ease of accessing ARVs are found to be effective strategies for improving adherence and retention in ART care.<sup>34-37</sup>

No doubt that the COVID-19 pandemic disrupted the uptake of HIV services such as HIV testing and ART initiations during the COVID-19 restrictions and lockdowns,<sup>33</sup> and particularly access of HIV services among ALHIV.<sup>34</sup> In our exploration, we observed disruptions in holding support group sessions because of lockdown and restrictions. Competing work demand in terms of clinician's level of effort concentrating on attending to COVID-19 infected patients and vaccination exercises also acted as a barrier to the implementation of the PSS intervention. Thus, attending to the HIV treatment needs of newly HIV diagnosed adolescent and existing ALHIV on ART was compromised. However, recent studies have documented innovative strategies to help combat the decline in uptake of health care service amidst an outbreak such as COVID-19. For example, sanitization and use of masks (cloth or surgical) when attending support group sessions, and differentiated service delivery-adopting patient centered approach such as pre packing of medications for either home or community center delivery (depending on the preferred choice and need of the ALHIV),<sup>38, 39</sup> as well as increasing access to multi-month dispensing (MMD) of ARTs.<sup>40</sup>

### Limitations of the Study

This work contains several limitations and opportunities for further research. Despite our efforts to involve broad samples from each participant category (ie, adolescents, professional health care workers, and peer educators), the final sample did not include peer educators because they were no longer in the employ of RTC at the time of data collection. Therefore, our findings on the implementation of the PSS intervention are mainly derived from accounts of professional nurses, community system technical officers, and adolescents. In addition, the current analysis did not investigate how gender identities and age may influence experiences of the PSS intervention. We suggest that future work focuses on exploring gender and age differences in experiences of the PSS intervention.



## Conclusions

The PSS intervention was implemented as planned with a promising positive impact on ALHIV adherence and retention in ART care. However, the implementation of the intervention was challenged by disruptions caused by the COVID-19 restrictions and regulations and competing work demands attributable to the health systems' response to the COVID-19 pandemic. Judiciously strengthening the implementation of the PSS intervention is needed before wide-scale roll-out. We recommend innovative approaches to alter delivery modes of interventions to account for systemic disruptions, as evidenced by the COVID-19 pandemic.

## List of abbreviations

|        |                              |
|--------|------------------------------|
| ALHIV: | Adolescents living with HIV  |
| ART:   | Antiretroviral therapy       |
| ARVs:  | Antiretrovirals              |
| HIV:   | Human Immunodeficiency-Virus |
| TB:    | Tuberculosis                 |
| WHO:   | World Health Organization    |

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## Ethics Approval and Consent to Participate

Ethics clearance was obtained from the University of the Western Cape Biomedical Research Ethics committee (BM19/1/8) and the National Health Research Ethics committee to conduct qualitative interviews (MP\_202102\_006). We adhered to the 1964 declaration of Helsinki guidelines. According to the declaration, research that involves human subjects among others must keep with the following (1) strive to protect life, health, privacy, and the dignity of the research participants, (2) employ greater care to protect the participants from harm and (3) conduct the research because the importance of the research purpose, outweighs the risk that might be attributed to the study either at present or in the future (18th WMA General Assembly, Helsinki, 2001). The researchers sought verbal and written consent from all study participants. Codes were also used to identify study participants during KII's. In addition, participants consented to the publication of their responses if they were kept anonymous.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.


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## Author's Information

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