Determinants of Feasibility, Acceptability, and Fidelity of an Adolescent Transition Package(ATP) for Adolescents living with HIV in Kenya

Chelsea Martin

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Public Health

University of Washington

2022

Committee:

Bryan Weiner

Kristin Beima-Sofie

Program Authorized to Offer Degree:

Department of Health Systems and Population Health

University of Washington

Abstract

Determinants of Feasibility, Acceptability, and Fidelity of an Adolescent Transition Package (ATP) for Adolescents living with HIV in Kenya

Chelsea Martin

Chair of the Supervisory Committee:

Bryan Weiner

Department of Health Systems and Population Health

Background: Adolescents living with HIV (ALH) experience the largest health disparities among individuals with HIV due to the lack of transition services to adult care. The Adolescent Transition to Adult Care for Adolescents Living with HIV (ATTACH) study was created to test the Adolescent Transition Package (ATP) intervention on its effectiveness.

Methods: Researchers from ATTACH and the UW conducted an RCT among 20 Kenyan implementation sites, 10 of which had in-depth interviews and focus group discussions using CFIR constructs to understand the determinants of acceptability, feasibility, and fidelity in implementing ATP. A thematic qualitative analysis of health care workers' responses was conducted to understand perceptions of readiness outcomes among adolescents.

Results: Providers were overall satisfied with the impact they observed in adolescent readiness and clinical outcomes. Implementation was influenced by the compatibility of the implementation sites for organizational support and their setting's need for the use of ATP tools. The design quality of ATP and its initial training enabled HCWs to feel confident during delivery and provided helpful pictures for adolescent understanding, even while navigating complications

from translation inconsistencies. HCWs agreed more individuals should be trained on ATP use to increase fidelity in implementation and increase the organizational manpower.

Discussion: Other studies have shown the need for scalable health systems-strengthening interventions to improve transition services for young adults. The successful determinants of implementation for ATP in the contexts of this study can motivate providers of other similar clinics to gain ATP training to address gaps in transition service practice. However, further research is necessary in this field to understand young adult health outcomes immediately following transition services from the ATP intervention.

Background

There are approximately 2.1 million adolescents living with HIV (ALH) globally, the majority living in Sub-Saharan Africa (SSA)[1]. ALH (ages 10 to 19) are an important area of public health focus as their early, often non-presenting acquisition of HIV can create significant health disparities if the adolescent does not initiate antiretroviral therapy (ART) before adulthood[2]. ALH exhibit poorer HIV-related behavior outcomes compared to adults and children, including lower rates of ART adherence and higher rates of loss to follow-up (LTFU). Poor clinical outcomes such as high viral loads also result accordingly. Delayed disclosure of HIV status, as well as a lack of tools and guidelines to support transition to independent care management have been cited as important contributions to these health disparity outcomes among ALH.

Transitioning adolescents to adult HIV services is one of the most vulnerable periods of change in a HIV-infected individual's life. The difficulties adolescents face in coping with socioeconomic barriers, stigma, and long-term disease treatment make loss to follow-up more likely when adolescents may face a lack of clinical infrastructure or provider training during transition[3]. Understanding patients' health outcomes post-transition also poses challenges as many low- and middle-income countries (LMICs) may lack surveillance data for the age groups of adolescents through young adults[3]. The importance of recording health outcomes during this period is not only because of the transient nature of changing service locations, but also due to the shift in personal responsibility for retention and disease management[4]. In 2016, a study was conducted in Kenya to improve mentorship and training to healthcare providers who assisted HIV-infected young adults transition to adult services. The decrease in loss to follow-up was not statistically significant, however this study did highlight the need for transition services, infrastructure, and training in Kenya[5].

The Adolescent Transition to Adult Care for Adolescents Living with HIV (ATTACH) study was a cluster randomized clinical trial implemented from 2020-2021 to test the effectiveness of an Adolescent Transition Package (ATP) to support the transition from pediatric/child-centered care to adult/independent care for ALH in Kenya. The development of ATP had been informed by the ATTACH study team after abstracting approximately 14,000 individual adolescent records and completed facility surveys from 102 large HIV care facilities in Kenya in 2018. Using a user-centered design approach, the ATP was designed to address gaps in healthcare provider access to tools for disclosure and transition[1]. Overall, the ATP was found to be effective in improving ALH readiness to transition. Alongside effectiveness, it is important to understand how and why the intervention was successful. Implementation science provides a meaningful strategy for evaluating implementation feasibility and acceptability and can provide important information that can bridge the gap between knowing what interventions are effective and moving them into clinical practice. To help understand determinants of implementation, the ATTACH study conducted interviews in 2020-2021 with HCWs and adolescent patients to understand lived experiences and perceptions of ATP. Understanding the determinants of ATP acceptability, feasibility, and fidelity can inform future scale-up of the intervention.

Specific Aim

In 2018 The National Institute of Health funded UW researchers to investigate determinants of ATP implementation and assess clinical outcomes such as viral suppression and adherence. The aim of this thesis is significant to the 2021-2022 ATTACH research to help determine how the ATP tool can be integrated into HIV clinics. The focus of this thesis will answer the 2021 ATTACH study's first aim through analysis of HCW in-depth-interviews of Western and Central Kenyan study sites. The goal of my thesis is the following:

Aim 1: Examine HCW actions and behaviors which impacted ATP tool uptake, and investigate the determinants of acceptability, feasibility, and fidelity of ATP implementation during the ATTACH clinical trial. ***Approach:*** I will analyze interviews with HCWs directly involved in implementing the ATP in Western and Central Kenya. The Consolidated Framework for Implementation Research (CFIR) will be used to guide identification of determinants on the perceived acceptability, feasibility, and fidelity of ATP.

Methods

Study Area and Design

Following ATTACH's randomized control trial that was conducted from 2020-2021, the National Institute of Health funded UW and ATTACH researchers to investigate determinants of ATP implementation. Of the 20 RCT sites, 10 implementation sites were recruited in this study. These sites included the following clinics in Western and Central Kenya: Mathare North Health Centre, Kariobangi Health Centre, FITC Dispensary, and the Got Kojowi Hospital. UW researchers utilized Implementation Science to provide meaningful interpretations in examining key determinants of the facilitation of ATP in these health care facilities.

Implementation Science is a useful lens to understanding the reasons for intervention uptake as studies show that evidence-based research typically takes 17 years to implement through action[6]. The Consolidated Framework for Implementation Research (CFIR) is a conceptual framework that identifies determinants that can positively or negatively affect implementation. This framework was utilized by UW and ATTACH researchers in designing interview guides and conducting qualitative interviews with providers and patients.

The CFIR identifies 39 determinants across five domains: intervention characteristics, characteristics of individuals, inner setting, outer setting, and implementation process. To answer

existing information gaps of ATP effectiveness, UW and ATTACH researchers developed survey items and focus groups that asked questions of ATP effectiveness across all five CFIR domains.

Ethical Approval

This study is approved by the Kenyatta National Hospital/University of Nairobi Ethics Review Committee (KNH ERC) (P248/05/2017, approval date: 2 October 2018, Ethics committee contact: Professor Guantai, KNH ERC P.O. Box 20 723–00202, Nairobi, Kenya) and the University of Washington Human Subjects Institutional Review Board (UWHSD) (STUDY00001756, approval date: 1 June 2018 Contact Kristen Wittmann, Tel+12062212093, email: kmw89@uw.edu)

Data Collection and Analysis

In 2021, UW and ATTACH researchers conducted a qualitative evaluation of perceptions and experiences of the implementation of ATP during the 2020-2021 ATTACH study. ATTACH researchers conducted 20 FDGs with HCWs, 48 IDIs with HCWs, and 48 IDIs with adolescents in English and Kiswahili. These languages were used for simplicity as the HCWs and patients used various Kenyan languages across the implementation sites. The participants were asked questions concerning their satisfaction of ATP and their observations of clinical patient outcomes[1]. For HCWs, the IDI guide was also designed to ask questions regarding daily responsibilities associated with the ATP intervention[1].

To answer the aim statement of this thesis, 20 of the 48 HCW IDI transcriptions were analyzed. The transcriptions were selected based upon shared implementation sites among HCWs and where the sites were located. Interviews with HCWs were analyzed using both a deductive and inductive coding process. CFIR framework constructs were first utilized in creating a deductive codebook to reach the goal of understanding acceptability, feasibility, and

fidelity of implementation. The CFIR domains of inner setting, outer setting, and implementation process were most often employed in analysis as the constructs represented HCWs observations of determinants of ATP's uptake among patients and in the internal setting. Deductive codes adopted from CFIR constructs that were helpful in answering the aim of this thesis included 'Executing Fidelity', 'Compatibility', 'Relative Advantage', and 'Complexity' to describe the feasibility of implementation. Inductive codes were then applied to answer the 2021-2022 ATTACH research questions of ATP effectiveness in implementation and clinical outcomes. Inductive codes also described HCWs perception of their patients' readiness for transition due to the uptake of ATP.

Using Atlas.ti version 9, an iterative process of consensus coding between two research team members occurred for 10 of the IDI transcripts. During this process, both researchers would code independently and then periodically meet to discuss and resolve discrepancies. As consensus coding was not completed for all 20 transcripts, these results should only be considered primary coded. However, the consensus analysis strengthened the validity of the themes which were concluded. Queries were generated to identify prominent themes which emerged from the investigated implementation outcomes of acceptability, feasibility, and fidelity.

Results

We conducted a total of 20 interviews with HCWs, from 4 facilities in Nairobi, Nakuru, and Homa Bay counties. The majority of HCWs were female (76%) and were a median age of 35 (IQR: 30-44). Participating HCWs included a range of cadres, including nurses (n=3), nurse counselors (n=4), clinical officers (n=5), and peer educators (n=14). All HCWs reported receiving training on ATP tools, with the majority reporting receipt of training directly from the study team, while others reported being trained by other staff within the clinic. Many HCWs reported recent (within the past 2 weeks) use of the transition booklet (59%) and transition tracking form (43%) from the ATP.

Most (95%) HCWs strongly agreed that the tools improved their ability to prepare ALH for transition, and the majority (98%) felt confident in their ability to successfully prepare adolescents for transition (Table 1).

Table 1: HCW demographic characteristics

Characteristic	N (%) or Median (IQR)
Age	IQR: 35(30-44)
Female	76%
Clinical Training	
Nurse	8%
Nurse Counselor	6%
Counselor	20%
Clinical Officer	10%
Peer Counselor/Educator	27%
Psychologist	2%
Doctor	0%
Other	27%
Years of Education Completed	IQR: 15(12-16)
ATP Training (total)	86%
Trainer: Study Staff	78%
Trainer: Clinic staff	8%
Confidence using ATP tools	98%
Perception of improved skills in transition	95%
Recent use of transition booklet	59%
Recent use of transition form	43%

HCWs believed that the ATP significantly improved ALH outcomes, including improved knowledge, adherence, retention, and viral suppression. HCWs directly attributed these positive changes in ALH outcomes to material covered in the ATP. HCWs also found the intervention to be acceptable, feasible and were able to implement tools and processes with fidelity. I identified nine major themes from the data that explain how and why HCWs were successful in implementing the ATP: 1) Readiness for Implementation constructs describe chosen beneficiaries per site influencing execution, 2) Engaging – Champions constructs were a necessary determinant of ATP implementation and engagement, 3) Implementation Climate – Compatibility constructs influenced HCW decisions of which ATP tools were used, 4) Design Quality and Packaging, Knowledge & Beliefs About the Intervention constructs describe HCWs perceptions of their satisfaction and dissatisfaction of ATP design and advantages of the Transition and Disclosure tools, 5) Executing Fidelity, Adaptability, Complexity constructs describe HCWs implementation processes and challenges, 6) Readiness for Implementation-Access to Knowledge & Information, Readiness for Implementation-Available Resources constructs describe HCWs perception of the importance of training and resource continuity, 7) Patient Needs and Resources constructs describe HCWs perception of patients' self-efficacy in individual ATP usage and the need for disclosure from caregivers prior to intervention, 8) Patient Needs and Resources constructs impacted HCWs perception of clients' decreased fear of stigma, improved readiness outcomes, and improved relationships, and 9) Implementation Climate-Compatibility, Readiness for Implementation-Access to Knowledge & Information constructs describe HCWs perception of ATP addressing internal gaps, training increasing HCW confidence and competence, and creating impact while meeting goals.

Fidelity: Readiness for Implementation constructs describe chosen beneficiaries per site influencing execution.

Each implementation site chose their beneficiaries differently. Some sites only gave the intervention to the clients in the intend-to-treat group. However, in most clinics, all adolescents benefited from ATP, not just the clients signed up in the study. Other beneficiaries sometimes included adult clients, pediatric patients, and caregivers.

> *"R: Previously it was intended for those who are in the study. But now if you find a gap in other adolescents you just do it. You just find yourself doing it even without the book you just yourself doing it so that even the other adolescent may get whatever the others have not." - Participant 20, Readiness for Implementation*

Fidelity: Engaging – Champions constructs were a necessary determinant of ATP implementation and engagement.

Providers recognized the roles of peer educators, champions, and mentor mothers along the side of the staff in implementing ATP. The roles of the program were often shared in the clinic to accomplish the goal of preparing all staff to be ATP educators. Peer champions were trusted members as they had ample experience that prepared them to answer adolescents' questions on their own and fill in gaps of rapport with patients. Caregivers also played a vital role in implementation of ATP, especially in executing disclosure with HCWs or at home. Finally, the ATTACH team played a role of supervision and support throughout each facility, especially in quality improvement meetings.

> *"I: How do you decide who to use the tools with?*
> *R: We had a plan…we had a plan on whom to see like we were group of six so it was easier for two people to handle 19-year-olds, somebody who can bond-in easily,*

somebody who've already made a rapport with so it was easier for us to use the tool depending on whom you're supposed to be seeing." - Participant 6, Engaging

Fidelity: Implementation Climate – Compatibility constructs influenced HCW decisions of which ATP tools were used.

Upon initial implementation, most providers utilized the ATP booklets that were provided for disclosure and transition conversations. On average, using ATP was found to be easier among cases in which disclosure had already been conducted, with the booklets as a supplemental tool to remind clients of important concepts. Other providers used disclosure ATP tools if the patents' caregivers had not fully disclosed to the child. And other facilities chose to only utilize disclosure tools for younger, non-disclosed clients. Still, the variation in timeliness or specific used tools of the ATP still does not negate the consensus of the perceived compatibility of ATP use among HCWs.

"I: Ooh, ok. Did you have a situation where somebody was already disclosed to; the opposite of that, like disclosure was already done, so you start doing disclosure and realize that disclosure has already been done. Did you have something like that?
R: Yeah, we did. In fact, those ones made it easier to go through with the books. We just stressed on the important things." – Participant 2, Executing Fidelity

Fidelity: Executing Fidelity, Adaptability, Complexity constructs describe HCWs implementation processes and challenges.

Providers executed varied strategies of completing ATP with adolescents. A few conducted group counseling sessions with adolescents to help them feel more comfortable discussing sensitive topics while being joined by peers. Others who conducted one-on-one counseling reviewed with the adolescents completed work before progressing on to new modules. Recaps

and reviews also varied between monthly to between chapters. Students' schedules were also considered for counseling sessions to occur between school breaks or after the duration of the school day. Additionally, providers often used the ATP tracking form to record missed appointments by adolescents.

To better assure excellent fidelity to the ATTACH program, some providers received training every 2 weeks. However, others who did not receive these additional overviews reported that they would have liked to be supported with supplemental training.

> "*R: We make phone calls; we know whether she is coming to the clinic and we get everything for her ready. So, when they come, we make sure we have used very few minutes at the clinic and we attend to them and they go home because if they stay here for long, they start complaining, me I came from school, so, we have to schedule our clinic well so, that when a youth comes, we give them first priority." – Participant 11, Executing Fidelity*

During implementation, providers noticed adolescents had a difficult time understanding and remembering the names of the drugs they were taking and learning about from ATP. Many providers reached similar conclusions to write out the drugs in shorthand to help adolescents remember. Other adaptations of ATP included removing redundant HIV information in cases where adolescents already were well familiar with the virus. Providers also modified the ATP forms to create spaces to indicate where progress had been made in the modules with an adolescent. Creating makeshift bookmarks was necessary for providers using ATP as some adolescents would forget what progress they had made previously, and progress indicators helped create reminders after long spaces of time.

The last notable adaptation made to ATP was language translations by the providers. Some of the booklets that were provided did not have sufficient language versions per the

beneficiaries. Providers that spoke Dhuoluo or Kiswahili sometimes changed the wording of the booklets to help the adolescents understand the material.

> *"R: … but what was very challenging for them is about those names of their drugs; they were very difficult for them to understand. so, I don't know what we could do...those drugs instead of writing them in full, they could be written in short so that they can understand, instead of writing the way they have been written in full*
>
> *I: Mmh*
>
> *R: We write them in short so that they can understand them, for example if we are using this DTG, this DTG that has come; like for us we call it in short, AF2E*
>
> *I: Okay*
>
> *R: Yes, so that makes them to at least understand because pronunciation is usually very hard to them*
>
> *I: Okay*
>
> *R: Those names are very difficult for them*
>
> *I: Okay*
>
> *R: Yes, that is the only thing we should change for them, I realized it is challenging them, those terminologies." – Participant 4, Adaptability*

Besides challenges resolved through adaptations to ATP, some of the obstacles of the implementation of the ATTACH program included time and staff limitations. One provider reported they never had enough time to go through the entire disclosure and transition process with an adolescent. Consequently, multiple team members could be responsible for taking an adolescent through the entire ATP package. Some overlap and repeated lessons occurred due to the lack of progress indicators and multiple individuals teaching the adolescents.

"I: And how did you share the implementation roles for this package?

R: Now, we used to do like this; if an adolescent has come and we are busy, we can call maybe a nurse from here to carry on teaching, sometimes if we are not busy then we go on and if they are many, everyone takes a number, or...you know we only had two books

I: Mmh

R: So, I take and another person takes, we finish then someone else takes over

I: Mmh

R: Yes, so at least everyone gets a chance to teach." – Participant 4, Complexity

Feasibility: Design Quality and Packaging, Knowledge & Beliefs About the Intervention constructs describe HCWs perceptions of their satisfaction and dissatisfaction of ATP design and advantages of the Transition and Disclosure tools.

Overall, the ATP tools were reported to take a short time to deliver the information. No expertise was needed to administer the tools, and there was no need to adjust complicated descriptions in the providers' own words. The tools directed conversations with provided words and pictures. The content and information presented in each module was sufficient to HCWs in improving treatment literacy and self-efficacy among clients.

HCWs found the language and the pictures made the information easier to present to different school levels. HCWs gained self-efficacy and believed they could implement the ATP tools as they followed the provided checklists.

"I: So what you are saying is that the ATP tools for disclosure were better?

R: Yes they were better.

I: You have told me what you liked, what were the benefits of using them?

R: The benefit was that it takes a short time to deliver content to the client, you don't need to use your own words to unpack the content, the pictures themselves somebody

can grasp the content from just looking at the pictures and even if you train some adolescent champions, they can administer it with other adolescents, it doesn't need like an expert to administer it." - Participant 8, Design Quality and Packaging

The major challenge faced with the design and quality of the ATP tools was the availability of language translations. HCWs found that the versions of Dholuo and Kiswahili were very difficult to understand, but they were able to conduct the lessons due to the excellent quality of the booklets' pictures. One example of the language challenges was the Luo versions available were Northern Luo and not Sothern Luo. One of the HCWs reported they needed better Kiswahili for their clinic as they had 43 tribes with various languages. However, there were some clinics where the adolescents did not understand English nor Kiswahili. In these clinics, the HCWs found that if the beneficiary did not understand Luo, utilizing the booklets became extremely challenging.

"I: Okay, you have said that the design of the tools were good, the pictorial parts of it were good, the content was good and the only thing that you did not like is the Luo version…

R: Yes, the Luo version was not good. It had some translations that were not Southern Luo. I think that part of them were from Northern Luo and we informed the ATTACH person and she told us that she gave you feedback, but now for the time being were using the Swahili and the English versions.

I: And did the adolescents comprehend the Swahili version?

R: Mostly we were always trying to be with them so as to translate for them. Even though the Luo version had issues, but the issues were not too many. They could still comprehend the tools." – Participant 14, Complexity

HCWs also faced some challenges in which clients couldn't remember what they had been taught in previous sessions. The photos and booklets were helpful in reminding patients what they talked about. The forms were especially key as at times HCWs lost files on patients' ATP progress. However, the booklets designs leave the HCWs unclear as to when a child has mastered the material. Having standardized questions or a survey for follow-up was a recommendation to solve this issue.

> *"R: The forms, the only thing that I did not like is the mastering and for example let me go back slightly for example when you are explaining, when you are taking the adolescent through the booklet, there is a way you have gone through a chapter then now the next time you will have a recap. But how sure are you that this child has mastered? I think that at that point the booklet is not very clear, because for you to know if a child has mastered or not is by having some questions that are standard, which were not there…" – Participant 18, Complexity*

However, before implementation, the staff did not have any pictures to describe transition. The pictures in both the disclosure and transition tools were helpful in explaining CD4 and viral load to the adolescents. Providers reported that the great design of the Taking Charge transition booklet made the HCW more motivated to explain CD4 and viral load. The questions in bold were also effective in understanding what a client learned after going through each module. The readiness assessments also helped the HCW ask questions about if the adolescent really understood why they are taking their drugs, if they understood why they should be, and questions on the drugs' importance.

> *"R: Taking charge has really motivated me, when am explaining to the client he sees the real picture I show him especially that place where the viral load is high and the CD4 is*

low. That picture excites me when you are comparing that time when the viral load is low and the CD4 is high…" – Participant 3, Knowledge & Beliefs About the Intervention

The disclosure booklet and tools were also reported to have simple but thorough explanations. The disclosure tool was comprehensive compared to what they had before. One HCW described their clinic previously using limited questionnaires to assess disclosure, with not much information. Another stated it took too much time to give information before disclosure. Providers agreed that the language of the ATP disclosure tool is simplified for both provider and patients whereas before, the medical jargon was confusing. Providers also appreciated that the tool also captured if disclosure was done or not and if so, who completed the disclosure. However, there were some components of the disclosure tool HCWs didn't think was important for the adolescents. Many believed the illustrations and description of the "bad guy" or "body soldiers" were harmful or unnecessary for the child to understand the pathology of HIV.

"I: Okay. And when you look at these tools, the way they have designed. What do you think? The content.... the pictures.... the language...

R: Mmmh, the language was very okay, simple and easy to translate. Even you can read it directly, but then the pictures sometime are a bit scary. Because if you are telling the adolescents of the structure of the bad guy and that the bad guy is in their body. How it looks. So, it can also have an impact based on the perception adolescents have of police. So, that bit was not that good.

I: So, there is the bad guy and there are the body soldiers.

R: Yes. So if you try to explain to them, you find the two of them seated asking why there is disease associated with the police officers (soldiers). As in you just feel how they relate with that issue.... I think we should look for another way to frame it. Not the bad guy as like the soldiers.

I: So even the soldiers don't work well?

R: Yes" – Participant 20, Design Quality and Packaging

Feasibility: Readiness for Implementation-Access to Knowledge & Information, Readiness for Implementation-Available Resources constructs describe HCWs perception of the importance of training and resource continuity.

Focusing on improving the feasibility of implementing ATP in the inner setting, there was an overall agreement among HCWs that more staff should be trained for and refreshed on implementation. Providers noted that all HCWs should be involved in capacity building to use ATP as the tools were easy to administer and took teamwork implementation. Increasing training among HCWs would also alleviate organizational challenges of needing multiple HCWs to teach ATP to clients.

The initial trainings were well received and reported to be helpful in teaching the participants to take the tools and the pictures seriously. The providers retained new information and gained confidence in their ability to lead disclosure and transition discussions. Some HCWs had concerns during their training that the actual implementation of ATP was going to be difficult, but they found the work to be easy because of the training.

Increasing access to training was often requested among HCWs as many believed sustainability of ATP could be possible by increasing the frequency of HCW trainings. To some, the one-day initial training did not provide enough information and experience and would resort to asking other HCWs questions about components of ATP they did not understand. It was also noted that refresher trainings would ensure good fidelity in the ATP information dissemination among HCWs who did not utilize the tools regularly.

"I: Okay, and what could be done differently in future about the training? What do you think we can do differently?

R: When I look at the training it was okay. What I saw was that the number of materials that we were given were not enough for the healthcare workers, and then again the criteria that was used probably we saw that there were some staff who were interested but being that they not actively involved in the adolescent activities, now they could not be part of the team, yes.

I: So you feel they should also be included in future?

R: In the future so that…because this is work that is…it is a team work so that in case one person is not there, the other person is around to come in, yes." – Participant 9, Access to Knowledge & Information

Resource continuity was another recommendation to improve the feasibility of ATP implementation for HCWs. Daily processes were difficult when sharing one book among providers. HCWs believed that if the booklets continued to be provided at the clinics, the impact and results that were made could also continue.

"R: The books has given more knowledge to the adolescents. So when you are leaving, you should leave everything planned.

I: Tell me more about that

R: Don't just leave like that, leave when the changes that we made, you come with a complete booklet.

I: So, the changes you had recommended, we give you the booklet back with the changes having been accommodated.

R: Yes.

I: Ok.

R: And it should be rolled out, so that it is something in every facility, and it is in the system, so that even when you are transferred elsewhere, it can be continued."

– Participant 2, Available Resources

Feasibility: Patient Needs and Resources constructs describe HCWs perception of patients' self-efficacy in individual ATP usage and the need for disclosure from caregivers prior to intervention

At times, adolescents asked to take home booklets to refresh their memory of what they were taught. HCWs were supportive of this as they believed adolescents could come to understand on their own why the information in ATP was important.

However, the general feasibility of meeting the patients' needs in disclosure was usually dependent upon what the caregivers had already done. It was not easy for HCWs to gauge the level of disclosure from caregivers. In some cases, what resulted from the uncertain disclosure status was HCWs accidentally disclosed to patients who didn't know their HIV status or had any disclosure from their caregivers. The HCWs emphasized that if the parents and caregivers did not disclose before the tool was used, providers could face major delays in taking adolescents through the booklets. For these reasons, the importance of completing disclosure earlier in a child's life was stressed among providers.

"R: The only problem was...the problem; parents should try and talk to their children early enough, so that we do not have a hard time with them when we are now talking to them, so when I am taking to him, if at all he didn't understand well from the parent now if I tell him, he will at least have an idea and if I tell him more at least they will understand better, because when he gets into that book and doesn't know anything, he has not been told anything, I can tell him that, for example "you are HIV positive" that child...and you know maybe he has been taught at school that when you are like that, that means dying." - Participant 4, Complexity

Acceptability: Patient Needs and Resources constructs impacted HCWs perception of clients' decreased fear of stigma, improved readiness outcomes, and improved relationships.

One of the patient benefits of ATP that HCWs identified was the package's ability to prepare adolescents to disclose their status to others. Providers believed ATP taught adolescents the importance of support systems. The adolescents were perceived to be confident of their treatment with less internalized stigma of their HIV status. HCWs also noted that beneficiaries of ATP overall disclosed to their partners more often as fear of HIV stigma reduced.

"I: Alright, so in what ways do you think ATP has impacted the provision of adolescent HIV services in this clinic?
R: It has increased on a positive way in that the clients are now confident on their treatment since we started using the ATP, we have also reduced the stigma of HIV, we have also…through the use of ATP clients are able to keep their appointments and the clients are able to manage themselves." - Participant 10, Patient Needs and Resources

Patients' needs were also met through outcomes which reflected the clients' readiness to transition to adult HIV services. For example, adolescents were reported to have become more independent and empowered to take on their health as their responsibility. HCWs believed that the comprehensiveness of the ATP tool provided sufficient motivation to enable clients to be ready for transition. HCWs believed that as a result of ATP, adolescents accepted themselves

"I: Okay, I will come to that shortly. But... based on your experience do you think this intervention, this adolescent transition package; is it effective to improve transition if its implemented say countrywide?

R: Yes, because it makes... the book makes the adolescents to have self... How do I put it?

I: They be independent?

R: Yes, they be independent, and they stop depending on other people to show them to take their medicine.

I: Mmmh so it can help in transition?

R: Yes." – Participant 1, Perception of Intervention Outcome: Readiness Outcomes

The HCWs perceived the clients having different levels of readiness to learn from ATP. In some cases, patients did not know how to read and were required to wait until they could come with a caregiver to explain the information being taught. Another challenged faced by HCWs in determining readiness was assessing a client's disclosure status. Often, clients who had retained a high viral load for years did not have proper disclosure completed through their caregivers. Determining whether the client was ready for ATP disclosure depended on the patient's age, education, and number of years the client had been on treatment. At times, documentation of the disclosure status of a child was incorrect, and accidental disclosure would occur.

"I: Okay, now we are moving on to the disclosure, now we want to get your feedback on the disclosure tools. Tell me about your experience using the disclosure tools that is the disclosure tracking form, readiness assessment and comic book from the adolescent transition package? How was your experience like with these tools?

R: Like the readiness assessment tools, like initially we did a sample of our clients and found like 90% of them have been done full disclosure and that is according to what was documented in the file. But now when we went to do the assessment we found like not even half of them had been disclosed to but it was just a documented but in the real

sense it was not done or if it was done it was done partially or we did not achieve the intended purpose of it. So when we did the assessment it helped us realize that it was done either wrongly, accidentally or it was just documented. So that is when it gave us a way we went back and sat down and started doing it afresh. We knew where to start from." - Participant 8, Patient Needs & Resources

HCWs believed that prior to ATP, caregivers had a much more difficult experience disclosing to adolescents without any relevant training. As the HCWs empowered the guardian to disclose, ATP lifted the burden from the caregiver of finding the words for these crucial conversations. As a result, patients' relationships with their caregivers did not deteriorate from disclosure conversations according to HCWs.

"R: … between the adolescents and the adults, it makes the adolescents understand why they are being told by the adults to take their medicine. So, I think it has done a good job and there is a good relationship between the caregivers and the adolescents. It has given them an easy way. The relationship between them is great." – Participant 20, Patient Needs & Resources

Patients' relationships with the HCWs were also reported to have been strengthened. HCWs were able to approach clients who previously did not want to come to appointments. Before ATP, HCWs did not know how to engage adolescents in disclosure conversations. Consequently, clients became apprehensive of receiving bad news. The rapport built between providers and clients during implementation gave HCWs opportunities to encourage patients that they could have healthy and normal lives because of their adherence. HCWs became more sensitive to the patients' views, emotions, and body language while taking them through the booklet.

"R: …It is about the tools because they bring the adolescents closer to us. When you are taking them through, you create rapport with the adolescents, and you get to know much about the client." – Participant 2, Patient Needs & Resources

Acceptability: Implementation Climate-Compatibility, Readiness for Implementation-Access to Knowledge & Information constructs describe HCWs perception of ATP addressing internal gaps, training increasing HCW confidence and competence, and creating impact while meeting goals.

HCWs gained confidence that ATP could be compatible with their clinic processes through the initial training that was provided through ATTACH. The training helped HCWs learn the best methods of disclosure and transition, which then addressed internal gaps in practice. HCWs who had less experience than others in disclosure and transition services gained competence to use ATP after the initial training.

"I: And what do you think about the training that you received?
R: We received training after every two weeks, even that helped us because we had confidence when were handling those adolescents and it really helped us and it also really helped the adolescents." – Participant 12, Readiness for Implementation-Access to Knowledge & Information

The HCWs found that ATP helped fill gaps in HCWs practice that providers had not recognized before, and also moved HCWs out of their comfort zones. For example, the simplicity of ATP's information at times helped adolescents go through disclosure or transition processes faster than before implementation.

"R: What I would say is the package is extremely beneficial to us, especially this I observed after the training actually with the use of tools because we had actually had quite a lot of gaps initially but as the tools and the whole package was introduced things became easier simpler when handling and actually being with the adolescent. So, it has been a good tool being beneficial.

I: Okay like you have said things became easier when handling the adolescents?

R: Yes." – Participant 19, Implementation Climate-Compatibility

All HCWs in the study noted their facility intended on continued use of the tools due to the compatibility of ATP meeting their patient outcome goals. Many were motivated by the success they have seen and had come to believe ATP was scalable. Lastly, another internal change that was seen was a decrease in cases of loss to follow-up among adolescents. This was due to ATP improving overall documentation among providers.

"I: Looking at implementing this tool, you've told me you were here from the beginning of the study, in what ways do you think the Adolescent Transition Package has impacted the services that are being provided at this clinic?

R: We can just say suppression. Our main aim was to get the knowledge and you use it so we can see results. The goal was to suppress the VL. So there has been impact on that…" – Participant 5, Reflecting & Evaluating

Discussion

Studies and literature reviews focused on ALH often highlight gaps in transition services for adolescents which create large risks of poor health outcomes. Other service delivery interventions have certainly been directed at improving transition services for young adults needing HIV treatment, however the existing body of research shows most intervention settings still struggle with a lack of transition service infrastructure, human resources, training, and surveillance of young adult health outcomes[2-5]. The results of this study show that not only was improving adolescents' self-efficacy in transition and decreasing fear of stigma feasible, but also the fidelity of training HCWs in topics of disclosure and transition was made possible by the organizational readiness of the implementation site and the satisfactory design quality of ATP. These results of the determinants of acceptability, feasibility, and fidelity of ATP provide insight to factors of how a scalable, successful evidence-based intervention could be implemented for organizations needing training of adolescent transition services.

Implementation of ATP uniquely addresses many gaps and barriers to successful ALH transition. For instance, the lack of retention and suppression among adolescents during transition that has been commonly described in other studies is addressed through information taught in the ATP disclosure tools. Then, the common consequence of loss to follow-up is prevented through proper use of ATP transition tools. The "simple but thorough" descriptions of the design of ATP made implementation and readiness outcomes feasible for providers in this study.

HCWs requested additional training to ensure the fidelity of implementation would continue after the study. Like previous studies, this implementation trial experienced manpower challenges as HCWs did not have enough time to take a child through ATP alone. However, some HCWs believed that the training was easy to understand for even providers unfamiliar with disclosure or transition services. Training and building capacities of HCWs was believed to

be feasible for any organization scaling-up ATP. This suggests that ATP could lift the burden of training HCWs for many organizations which do not have resources to help transition ALH to adult services.

HCWs in this study reported that CD4 and viral loads were improved as adolescents gained understanding from descriptive pictures and information in ATP. Many studies report differently that adolescents and young adults experience significant health disparities as they are transitioning to adult treatment services. The improvement in health outcomes could also be attributed to the adolescents' increase in confidence and self-efficacy in taking care of their own health. Additionally, HCWs in this study believed that ATP filled gaps of practice and documentation that may be missed in other facilities.

The methodology of first conducting an RCT and then following up with IDIs and FDGs differs from similar intervention studies as this study measured readiness for transition outcomes through a readiness scale of a 22-item survey and through using CFIR in understanding determinants of implementation. These quantitative and qualitative results are important to other works of research on improving the impact of transition interventions as the existing literature is focused on the health outcomes after transition, and not often determinants and impacts of implementation.

The design of ATP in capacity building for HCWs and improving readiness and clinical outcomes for adolescents is a great model that could be adopted in other contexts struggling to find adequate interventions for transitioning ALH. The determinants of acceptability, feasibility, and fidelity of ATP were specific to the Central and Western Kenyan context, but they could also be generalized to other SSA locations as facilities could share many similarities in implementation determinants. The success and satisfaction with the implementation of ATP look promising, but further research is needed to address questions of improving health outcomes with newly transitioned young adults.

Limitations

This thesis is limited to the Western and Central Kenyan locations which participated in ATP adoption and subsequent in-depth-interviews. The results from the iterative qualitative coding process will not reflect the opinions and values of all HCWs who participated in the IDI's, as this thesis is limited to the 20 transcriptions that were analyzed.

Further studies in determinants of ATP implementation should study outcome data that is disaggregated by patient demographics and concentrate especially vulnerable populations for lack of transition services such as young, pregnant women.

References

1. Njuguna, I. N., Beima-Sofie, K., Mburu, C. W., Mugo, C., Neary, J., Itindi, J., Onyango, A., Richardson, B. A., Rubin Means, A., Sharma, M., Weiner, B. J., Wagner, A. D., Oyiengo, L., Wamalwa, D., & John-Stewart, G. Adolescent transition to adult care for HIV-infected adolescents in Kenya (ATTACH): study protocol for a hybrid effectiveness-implementation cluster randomised trial. BMJ open. 2020; 10(12): e039972. https://doi.org/10.1136/bmjopen-2020-039972
2. Enane LA, Vreeman RC, Foster C. Retention and adherence. Current Opinion in HIV and AIDS. 2018; 13 (3): 212-219. doi: 10.1097/COH.0000000000000459.
3. Sohn AH, Vreeman RC, Judd A. Tracking the transition of adolescents into adult HIV care: A global assessment. Journal of the International AIDS Society. 2017;20:21878. doi:10.7448/ias.20.4.21878
4. Dahourou DL, Gautier-Lafaye C, Teasdale CA, et al. Transition from paediatric to adult care of adolescents living with HIV in sub-Saharan africa: Challenges, youth-friendly models, and outcomes. Journal of the International AIDS Society. 2017;20:21528. doi:10.7448/ias.20.4.21528
5. Judd A, Sohn AH, Collins IJ. . Interventions to improve treatment, retention and survival outcomes for adolescents with perinatal HIV-1 transitioning to adult care. Current Opinion in HIV and AIDS. 2016; 11 (5): 477-486. doi: 10.1097/COH.0000000000000302.
6. Morris, Z. S., Wooding, S., Grant, J. The answer is 17 years, what is the question: Understanding time lags in translational research. Journal of the Royal Society of Medicine. 2011; 104(12): 510–520. https://doi.org/10.1258/jrsm.2011.110180