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ORIGINAL PAPER

Understanding the Effect of a Healthcare Provider-Led Family Planning Support Intervention on Contraception use and Pregnancy Desires among Postpartum Women Living with HIV in Southwestern Uganda

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Abstract

Modern contraceptive prevalence among women living with HIV (WLWH) in Uganda is still low at 45%, and up to a third of women are likely to discontinue the method within the first year of initiation. This increases risks of unplanned pregnancies, perinatal HIV transmission and pregnancy complications. We aim to explore and explain the mechanism of effect of a family planning support intervention investigated in a randomized controlled trial conducted between October 2016 and June 2018 among 320 postpartum WLWH at a referral hospital in Southwestern Uganda that led to improved uptake, decreased contraception discontinuation and lowered pregnancy rates. Thirty WLWH and 10 of their primary sexual partners who participated in this trial were purposively selected and interviewed in the local language; interviews were digitally recorded. Translated transcripts were generated and coded. Coded data were iteratively reviewed and sorted to derive descriptive categories using an inductive content analytic approach. Up to 83% of women wanted to avoid pregnancy within the first year postpartum. Qualitative data showed that contraception uptake and use were influenced by: 1) Participant awareness and understanding of different methods available; 2) Participant perception of offered health services; 3) Healthcare provider (HCP) socio-cultural sensitivity to individual experiences and (mis)conceptions surrounding contraception; 4) Having tactile engagement, follow-up reminders and a reference to prompt action or discussions with partners. Supportive and culturally sensitive HCPs and systems facilitated information sharing leading to increased patient awareness and understanding of the contraceptive methods, and improved health user experience, care engagement, confidence and willingness to take up and continue using modern contraceptive methods.

Keywords Adherence intervention · Family planning support · Uganda · WLWH · Social support

Introduction

While many women living with HIV (WLWH) want to have children [1, 2], a study looking at future pregnancy plans and associated factors among postpartum WLWH in Southwestern Uganda documented more than 95% women desiring to avoid pregnancies in the 12 months following birth [3]. However, there is a high unmet need for family planning among WLWH in Uganda, where modern contraceptive use is low at 45% [1, 4–6]. This prevalence remains within the low national prevalence of 35% and 51% for the married and unmarried women respectively, despite the widespread promotional messages across the country [7], leading to increased risks of unwanted pregnancies, associated

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complications and perinatal HIV transmission, as well as increased economic burden of care among others [8, 9].

Maternity and reproductive health services play an important role in facilitating family planning. At these services, healthcare providers (HCPs) connect with individual clients, support and encourage positive behavior leading to better health outcomes [10, 11]. Whereas many factors generally influence adherence to healthcare interventions, including systemic factors such as healthcare access and treatments costs or patient-related factors such as personal beliefs about treatment, HCP-related factors such as communication and social support remain the most important factors influencing the utilization of maternity and reproductive health services [12, 13]. Social support can be instrumental support (physical and economic) and, or emotional support (emotional/psychological or informational) [14, 15]. Other HCP-related factors that affect patients' healthcare experiences, decisions to seek care, and uptake of health services include HCP clinical and inter-personal skills as well as HCP beliefs and values [16].

Up to a third of women starting a modern contraceptive method discontinue the method within the first year [17]. The ability of HCP-led social support to increase uptake of and adherence to modern contraceptive methods postpartum among WLWH in Uganda was recently investigated in a randomized controlled trial [6]. In this study, WLWH delivering at a publicly-funded regional referral hospital in rural southwestern Uganda received a family planning voucher, inclusive of structured one-on-one immediate postpartum counseling, additional health information and follow-up SMS reminders and reviews. The intervention was associated with over 90% family planning uptake rates [6], decreased contraception discontinuation, 10% in the intervention group versus 24% in the standard of care group, and decreased pregnancy desire within the first two years postpartum, 3% in the intervention group versus 13% in the standard of care group [18]. The rate of pregnancy was 2% and 9% in the intervention versus standard of care groups respectively. Contraceptive methods used by study participants were; (N = 194, 63%), implants (N = 61, 19.8%), condoms (N = 22, 7.1%), Intrauterine Device (N = 15, 4.9%, oral pills (N = 12, 3.9) and others (N = 4, 1.3%).

Behavioral change interventions aimed at improving medication uptake and adherence, including the described HCP-led family planning support intervention, often consist of multiple components, making it difficult to identify the specific components responsible for observed health outcomes [19]. While several studies worldwide have demonstrated the ability of HCP-led interventions to improve medication adherence [6, 12, 20], a gap in knowledge persists regarding the mechanism through which improvement is achieved, and how they shape individual healthcare experiences and decisions to initiate, continue or discontinue contraception.

In this study, we explore and explain the mechanisms of effect for the described HPC-led social support intervention that significantly improved uptake and use of contraception, reduced pregnancy and pregnancy intention outcomes among postpartum WLWH in Southwestern Uganda. A better understanding of factors influencing contraception use in this context will aid in the design of future family planning interventions in Uganda and sub-Saharan Africa.

Methods

Study Design and Setting

This study recruited participants from the maternity ward of a regional referral hospital located in the rural district of Mbarara, Southwestern Uganda. The hospital is a publicly-funded teaching hospital serving a population of over 5 million people residing in over 13 districts, with a maternity ward HIV prevalence of 12% [21], and an estimated fertility rate of 4.8 children born per woman [22].

A group of WLWH who participated in a previously-described randomized controlled trial [6, 18] investigating an HCP-led family planning support intervention, and their primary sexual partners were purposively sampled for qualitative interviews.

Randomized Controlled Trial Design

The trial aimed to evaluate the effect of an HCP-led family planning support intervention versus standard of care on contraceptive use at 12 months postpartum (NCT02964169). In brief, 320 WLWH, 18 years or older, who were admitted to the postnatal ward (regardless of pregnancy outcome) and qualified for the available family planning methods were randomized to receive either a family planning support intervention or standard of care (control). Women in the intervention arm participated in face-to-face one-on-one structured educational counseling from a study nurse that lasted up to 1 h. The women were also offered a family planning voucher [6] which had detailed information about side effects for the different contraceptive methods as well as a general overview on benefits of the different family planning methods by a study nurse for free. The voucher was valid for three months from the date of delivery and allowed participants to attend a family planning session. Women were given the opportunity to ask questions during the counselling sessions to facilitate women's informed choice of any of the five freely-available family planning methods at MRRH: condoms, injectables, contraceptive pills, copper IUDs, and a contraceptive implant. WLWH were also counseled on the standard days method, and lactational amenorrhea method of family planning. The same family planning voucher

and counseling was given to any present sexual partners considering the documented influence of partners on family planning utilization [23]. The family planning voucher was used as an incentive to motivate and empower women to seek and access family planning easily at family planning clinics near them. A trained nurse was available at the postnatal clinic to offer free administration (e.g. injection, IUD placement, implant) of a contraceptive method in case stock outs required participants to purchase a contraceptive method outside of the public healthcare facility. Regular SMS reminders, at different intervals depending on the contraceptive method chosen [24], were sent to participants and their sexual partners.

Women in the control group were offered routine family planning counseling at discharge by a trained ward nurse as per the standard of care defined in the Uganda clinical guidelines [25]. The control group did not receive a family planning voucher, nor did participants or sexual partners receive SMS reminders.

Women were followed for one year. At enrollment, a structured face-to-face questionnaire was administered to gather information on socio-demographics, depression [26], reproductive history, partnership dynamics, HIV serostatus disclosure, partner HIV-serostatus, perception about contraception use and decision making [5, 8, 27–31], food insecurity [32, 33], alcohol use in the last one year [34], HIV stigma [35], social support [36] and pregnancy intentions [37–39]. Follow up visits were scheduled for 6 and 12 months postpartum. Contraceptive use was assessed during these follow up visits.

Participants, Recruitment and Data Collection

A subset of 30 WLWH were purposively selected from each of the two trial arms and invited to complete in-depth interviews at study exit. Women were encouraged to invite their partners for a separate in-depth interview to explore their experiences on the study. Ten sexual partners were enrolled and interviewed. Women were selected and interviewed based on the study participant's trial outcomes such as; at least or less than 90% of consistent contraceptive method use, no contraceptive method use, contraception enrolment status, pregnancy intentions, method of contraception and spouse relationship characteristics (spouse HIV disclosure status, HIV sero-discordance status). Purposive sampling aimed to gather in-depth information from specific participants with specific characteristics that would help explain the mechanism of effect of the family planning support intervention investigated in a randomized controlled trial. These interviews explored contraceptive method decision making, selection, experience with childbirth and the contraceptive method, experience with the HCPs, engagement with HCPs, type of social support, face-to-face counselling, contraception challenges such as side effects, stock outs, participant's perception of the SMS and or family planning support intervention, awareness of study participants' missed doses, switching, discontinuation and their response to the SMS reminders.

The interview guide was developed using the constructs of the Health Utilization Model (HUM) [40]. Interviews were conducted by two independently hired and trained research assistants (both female, social scientists) in the local language (Runyankole), and digitally recorded. Interviews lasted up to one hour. All interviews were conducted by a native speaker and recorded digitally in a private space mutually agreed upon by the participant and the interviewer. Qualitative interviews were digitally recorded with the participant's permission and transcribed from the local language directly to English by the same research assistant. The research assistants were not involved in concept development or coding of data.

Data Analysis

Translated transcripts were coded using NVivo10 software (Melbourne, Australia). In this analysis, we aimed to construct themes describing individual healthcare experiences, contraception choices, challenges and decisions. Coded data were reviewed to identify repeated patterns and sorted to derive categories using inductive content analytic approach [41]. Categories were then developed to describe the identified themes emerging from the coded data. Coding was jointly done by ECA and JNN. Together with GRM, disagreements in coding were resolved and a codebook generated to ensure consistency.

Results

Participant Characteristics

A total of 30 study participants and 10 sexual partners were interviewed. The median age was 28.2 years (inter-quartile range [IQR] 22–30) and 29.5 years (IQR 26, 42) for participants and sexual partners respectively. All women were enrolled on ART, with a median CD4 count of 402 cells/mm^3 (IQR 342,436). Sixty percent of interviewed WLWH had partners enrolled on ART, and a third of the women used family planning in the last two years before their last pregnancy. Seventeen and fifty percent of women and sexual partners desired for pregnancy within the first year postpartum respectively. Twenty (66.7%) women received the intervention. Seventeen percent of interviewed women had experienced domestic violence in current relationships. Sixty-seven percent of interviewed women had disclosed

their sero-status to their spouse or sexual partners, and less than 60% were sure about their sexual partners' sero-statuses. Most of the participants perceived the family planning support provided by the study as useful. Other demographics are represented in Table 1.

Qualitative Results

In qualitative interviews, different factors known to influence healthcare service utilization were explored including: predisposing, enabling and need-based factors. Factors identified by interview participants as influencing contraception use and choices could be grouped into four themes: 1) Participant awareness and understanding of different methods available; 2) Participant perception of offered health services; 3) Socio-cultural sensitivity and attention displayed by HCPs to individual experiences and (mis)conceptions surrounding contraception**;** 4) Having tactile engagement, follow-up reminders and a reference to prompt action or discussions with partners. Early interaction, follow-up and continuous engagement with the HCPs within a supportive, respectful and responsive environment encouraged ongoing discussions and insightful information transfer about birth goals, risks and the need for long- or short-term contraception among WLWH.

Participant Awareness and Understanding of Different Methods Available

Women reported that their continued use of family planning methods was encouraged by the improved awareness obtained from HCPs about the different contraceptive methods to choose from at the one-on-one family planning clinic sessions within their communities. Women thought that the active HCPs engagement immediately after birth "*opened their eyes*" about the availability of a wide range of both long and short acting contraceptive methods and motivated them to seek for contraception sooner. Women also reported that HCPs were able to introduce to them the different contraceptive methods, how they worked, where and when to find them in different facilities. According to participants, this detailed information helped ease couple's perceived fears of regular stock outs for certain family planning methods, and guided them to choose and consider certain methods based on availability at different health centers and their ability to refill, switch or obtain them easily at nearby public facilities or privately in case it ran out of stock. According to interviews, the information helped women to comfortably choose their preferred method in time. In addition to availability, women chose methods that provided them with the needed independence and privacy whenever their sexual partners or other significant others were not supportive of modern contraceptive use. A 29-year-old mother of two (intervention arm) said,

> *"The nurse called me before I was discharged and talked to me about the different methods available. She really opened my eyes and encouraged [me]to try out the implant but from our conversation, I chose to use the injections because I was sure that I can get injections anywhere else in other clinics in case the study ends…or change [to another method] if this one causes me problems".*

Another 21-year-old mother of one (control arm) said,

> *"The nurse at the immunization clinic told me that I can get my pills, IUD or implant from any health center near here and I liked it… but I decided to switch to injections because no one will know that I am on contraception and I can take it for some time before I sort myself to come back for more…My husband doesn't like me to use these things but I always get my injection every time I get a chance to go to any health center nearby".*

Participant Perception of Offered Health Services

Many women, especially those that attended family planning clinic at the referral hospital where the study nurse was stationed described the services as friendly, insightful, interactive and responsive, with the nurses offering to address their fears and challenges patiently, unlike the women who attended family planning clinic in the peripheral or satellite clinics. Women in the intervention group reported that the anticipation of a supportive and respectful treatment environment provided at the facility motivated and encouraged them to always come, engage and interact freely with their HCPs continuously, with some describing HCPs as their *"treatment companions"*. According to the interviewed women, this continuous engagement facilitated good discussions of family planning, follow up and enhanced confidence and trust between them and providers within the healthcare system. On the other hand, the women in the control group described negative experiences of unsupportive behavior and unresponsiveness to their questions and needs from the different HCPs they met at different health centers. According to a 32-year-old mother of five (intervention arm),

> *"I used to hear from my friends who got pregnant while on these implants* or *IUDs that it would disappear in my uterus… I had used pills before, which had failed me. So I asked the nurse who counseled me and my husband before discharge and she took her time to really show us how to benefit from any of the methods and avoid these things. She was patient with us and allowed us to ask all questions...She was really friendly*

Table 1 Baseline characteristics of interviewed WLWH and their sexual partners

Characteristics	Participants (N = 30)	Sexual partners (N = 10)
	Median (IQR), mean (SD) or n (%)	
Sociodemographic and other health characteristics		
Median Age (years)	28.2 (22,30)	29.5 (26,42)
Median CD4 (cells/mm3)	402 (342,436)	–
Partner on ART	18 (60.0)	10 (100)
Education attainment greater than primary	15 (50.0)	9 (90.0)
Within parity: 1	5 (15.7)	–
2–3	17 (56.7)	–
> 3	8 (26.7)	–
Prenatal visits attended ≥ 4	21 (70.0)	–
Severe food insecurity[a]	9 (30.0)	4 (40.0)
Depression score[b]	4.1 (3.7, 7.2)	5.7 (4.0, 6.8)
Median social support score (IQR)[c]	1.8 (1.4,2.5)	3.4 (2.6,3.8)
Stigma Score[d]	4 (3,5.6)	3.2 (2.4,4)
Consumed alcohol in last 1 year	15(50.0)	10 (100)
Household income: ≥ 100,000 Ush	14 (46.7)	6 (60.0)
Monogamous household	14 (46.7)	8 (80.0)
Contraception use and pregnancy desires		
Used modern contraception in 2 years pre-pregnancy	10 (33.3)	–
Desire for pregnancy within 1 year postpartum	5 (16.7)	5 (50.0)
Most recent pregnancy planned	18 (60.0)	–
Relationship dynamics		
Domestic violence in current relationship	5 (16.7)	0 (0)
Disclosed HIV sero-status to sexual partner	20 (66.7)	5 (50.0)
Knows/sure about sexual partners sero-status	14 (46.7)	6 (60.0)
Takes part in decision making	18 (60.0)	10 (100)
Spouse is aware of family planning use	23 (76.7)	–
Intervention and outcomes		
Received intervention	20 (66.7)	10 (100)
Opinion of SMS notifications[e]		
Very much liked	17 (85.0)	10 (100)
Liked	2 (10.0)	0 (0)
Did not like	1 (5.0)	0 (0)
Usefulness of intervention[e]		
Extremely useful	15 (75.0)	10 (100)
Fairly useful	3 (15.0)	0 (0)
Useful	1 (5.0)	0 (0)
Little usefulness	1 (5.0)	0 (0)
Not useful	0 (0)	0 (0)
No contraceptive method use	10 (33.3)	–
Missed contraception doses	10 (33.3)	–
Consistent contraceptive method use	10 (33.3)	–
Method of contraception		
Injections	10 (33.3)	–
Implants	6 (20.0)	–
IUDs	5 (16.7)	
Oral pills	6 (20.0)	
Others	3 (10.0)	

[a]HFIAS > 8 means severe food insecurity

[b]This score ranges from1–48 indicating 0 as no depression

[c]This score ranges from 1–4, with 4 indicating high levels of social support

[d]This score ranges from 1–8, with 8 indicating high levels of stigma

[e]Participants who received the intervention

and explained everything. We actually learnt so many things from the discussion before we were discharged. It was very important to us… we liked her a lot and still call her to ask her many questions in case we get problems. She is like our treatment companion now".

A 39-year-old mother of five (control) added,

"I went to the health center near our home but the nurse there was very rude to me, even after waiting for six hours. She was yelling at us. She said she was tired and we had come late after she had given out attendance numbers…Because my husband doesn't want to use condoms, I was scared because I know of many people who got pregnant while using the implant or the IUD...I came back and it was the same nurse, so I went away and tried to count my days. I was upset when I found out I had got pregnant again. I do not know what to do now".

Socio-Cultural Sensitivity and Attention Displayed by HCPs to Individual Experiences and (mis) Conceptions Surrounding Contraception

The women's choices and decisions to initiate and use modern family planning methods consistently were influenced by their individual or community understanding of modern contraception as well as expectations of its side effects. The women's understanding of benefits of modern contraception, misconceptions and interpretation of side effects for example, seemed to stem from women's previous experiences with the contraceptive method, experiences of people within their social network and the extent to which they had been exposed to an unbiased counseling session or education talk with a trained and trusted HCP. The ability of the HCP to understand socio-cultural differences, expectations, misconceptions and myths and their ability to respectfully navigate and address women' fears and challenges without prejudice influenced uptake of modern family planning methods among these WLWH. This respectful engagement by HCP also facilitated women's appreciation and understanding of expected benefits and side effects of modern contraception, helped demystify misconceptions about different family planning methods, and influenced decisions to take up and consistently use, or switch methods as needed. A 27-year-old mother of four (intervention arm) said,

"I used to know that those things [IUDs] cause cancer and can even escape to the stomach and you die, or cause you to be barren in future and my husband didn't want to use condoms anymore. The nurse did not judge me and I felt comfortable talking to her. She explained to me very well how these methods work and even showed me and I now know it is not true…With my injection, I know I won't get pregnant again quickly as it has been happening…I have been bleeding a lot but the nurse told me it will reduce eventually so it is ok. I'm not worried".

A 32-year-old male, spouse of a mother of four (Intervention arm) said,

"I used to know that family planning makes women infertile or like make women promiscuous and all. And like women collapse and die because of these things so I told my wife never to use it…We have had three children in three years and good enough, I was there when the nurse took her time to take us through this thing called family planning…She looked to understand our beliefs as Catholics. We were alone and it was true, these things (methods) can help us as we need to plan our families… now my wife has been taking her pills without any problems. I remind her everyday so she does not forget them".

In the control arm, misconceptions around contraception persisted with a 26-year-old mother of two who got pregnant in the first 6 months after birth saying,

"Those pills make me fat. I also lose sex drive so it is not good for me [laughter]… I also heard that these modern things can cause cancer or infertility so my husband doesn't support them at all…I once used pills and he complained when I started getting headaches so I stopped them. He said we can produce as many children as we want first and then maybe think of another natural way to stop when we are done".

Having Tactile Engagement, Follow-up Reminders and a Reference to Prompt Action or Discussions with Partners

The HCP's engaging and sustained discussions on birth goals, health risks of unplanned pregnancy and childbirth played an important role in influencing women's choice and long-term use of family planning methods consistently and continuously. According to interviewed women, HCPs were able to connect and guide them on safely using contraception on an individual basis, and that these interactions helped them override the perceived inconveniences, discomfort and or side effects of modern family planning methods. Many women reported that HCPs were able to help them adequately discuss birth goals, appreciate health and economic risks associated with unplanned pregnancy and child birth during their immediate postpartum period as WLWH. Furthermore, the information on the family planning voucher facilitated and or prompted continuous discussions with sexual partners on family planning or when to have more children, especially those who were unavailable

during the one-on-one counseling. This information given out to individuals also acted as an ongoing reference for the interviewed women. A 36-year-old mother of five (intervention arm) said,

"Whenever I feel tired and uncomfortable taking these pills, I remembered what the nurse told me about risking my life again as someone already infected with HIV to produce like a rabbit [laughter]…I had time alone with her and I learnt that I could wait and plan for my next pregnancy when I am ready and that I can switch from whichever gives me a hard time provided I don't delay for more than 2 days so I am very careful…I used the Information on the card(voucher)to help me to explain to my husband about family planning since he wasn't around when the nurse talked to me and he has been helping me to remember to take my pills"

A 28-year-old mother of one (intervention arm) added,

"The nurse took time to talk to me and my husband alone before I was discharged. We went back when my baby made 6 months and asked her a lot of questions…We had never had these one-on-one experiences before as individuals. She personally guided us and made us understand it is very risky to have another baby quickly so we settled for an implant that will keep us safe for at least 3 years".

Our qualitative data also revealed that active interaction with HCPs through SMS and focal persons stationed at the family planning clinic helped to engage, motivate, encourage and remind women to use their chosen family planning methods effectively and continuously. Many participants, especially those who opted for short-acting family planning methods such as condoms, contraceptive pills and contraceptive injection, seemed to have been triggered to remember their doses and or plan refills in time through SMS messages. This SMS support also seemed very useful in prompting or reminding participants about their refills or upcoming doses especially among dysfunctional relationships that involved unsupportive spouses that did not appreciate modern contraceptive use. Additionally, the SMS reminder mechanism, coupled with good relationships established during face-to-face one-on-one counseling sessions between HCPs and participants before discharge did not only offer women an opportunity to appreciate the need for immediate postpartum family planning, but also facilitated the needed regular "*connection*" to the healthcare system. Women reported that the provision of a dedicated nurse stationed at the family planning clinic provided them with additional social support and an opportunity to a key focal person to contact whenever necessary. The HCP consistent presence at the clinic therefore facilitated continuity of care and follow-up with a familiar person perceived to have good clinical and interpersonal skills to adequately explain and support individuals initiated on different modern contraceptive methods. The ongoing interaction with HCPs also helped women to appropriately switch family planning methods as needed. A 23-year-old mother of two (Intervention arm) said,

"I was counseled with my husband before discharge and the nurse helped us a lot to look for the best family planning to use and I have been receiving SMS messages to remind me to take my pills every day so I cannot forget…I like the messages a lot because sometimes you feel tired of these pills and then the message comes and I feel encouraged to keep taking…that way, we always feel connected to you people and whenever I go to the clinic, I pass by her to get my pills or just say hello…I also pass by the nurse there and ask her some questions in case I didn't understand anything".

A 34-year-old mother of two (Intervention arm) added,

"The [study] nurse had given me her number so I called to let her know that I was not able to come for other pills that day and she advised me to use condoms in the meantime or look for a closest clinic… when I eventually came back, she had gone home but she came back, sat with me and again explained to me everything but this time, I decided to change [from pills] and use injection because it is more convenient for me without worrying everyday".

Discussion

In a recent randomized controlled trial among postpartum WLWH and their primary sexual partners in Southwestern Uganda, we demonstrated that an HCP-led social support intervention improved uptake and continuous use of modern contraceptive methods, thus reducing unwanted pregnancies [6, 18]. This current qualitative study data revealed that continuous HCP-participant interactions and relationships improved participant awareness and understanding of different methods available, as well as perception of and confidence in offered family planning services. HCPs were able to engage and respectfully address individual social and cultural circumstances, concerns and or challenges that affect family planning utilization. The intervention was tailored to provide women and their sexual partners family planning advice and guidance on birth goals, desires for more children and risk by trained HCPs based on individual circumstances, as well as providing a reference material and follow-up through key focal personnel, and SMS reminders to facilitate continuous interactions, engagement and continuity of care. This study elucidates how available, respectful, patient, attentive and motivated HCPs can foster productive

interpersonal interactions, understanding and relationships that help people to appreciate and navigate through complex socio-cultural and structural barriers to healthcare. Support through reference materials and mobile health approaches promoted user engagement, prompt action or discussions with partners and supported contraception- or medicine-taking behavior especially amongst long-term medicine or facility users.

The key role played by HCP-initiated interventions to support and improve utilization of health services and adherence in low resource settings has been documented [12, 14, 15, 42]. HCPs can monitor, provide physical, structural, informational or emotional support, leading to health behavioral change and better maternal health outcomes [10, 11, 43, 44]. This kind of support and interaction helps individuals to understand the benefits, build confidence in the promoted behavior, navigate through their fears and challenges thus helping them to adapt, cope or mitigate competing demands to meet institutional or individuals expectations [16, 45–47]. Healthcare provider support can also facilitate health literacy through provision of additional information to aid knowledge transfer, awareness, and self-efficacy to confidently adhere or complete positive health behaviors especially among vulnerable patient groups [48–50]. Health literacy was integrated into the family planning support intervention for this trial to improve information transfer and knowledge to support consistent use of family planning methods. Interviewed women who received family planning support reported to receipt of insightful, useful, interactive information about risks, contraception needs, and birth goals within a supportive and responsive environment that enabled them to understand and confidently initiate, adapt and switch contraception as needed over a long time. The study nurses also had enough time that was compensated to provide good support, enable adequate discussion on contraception needs, benefits, and risks in a respectful and private environment. This kind of patient-centered engagement has previously been documented to improve women's perceived need to take up and adhere to a promoted behavior such as family planning [51]. Alternatively, negative relationship patterns such as mistrust, non-communication, resentment and relationship breakdown negatively impact adherence among people living with HIV [52].

Interventions aimed at improving uptake and adherence often involve multiple components, making it difficult to identify components specifically responsible for the observed health outcomes. According to Johnston and colleagues, treatment counseling and education, educational materials, SMS reminders and continuous monitoring were identified as key impactful components of interventions that improved adherence [19]. In the same study, the authors consistently observed improved adherence and adherence outcomes in reminder-based interventions at three and twelve months. Other studies have also documented improved odds of medication or program adherence with structured and sustained follow-up phone interventions compared to single contact over time, especially when a pre-discharge HCP face-to-face interaction was included in the intervention [53]. In this study, HCP's early and continuous interaction with women and their sexual partners through one-on-one counseling plus additional materials, helped them to adequately appreciate offered family planning services, and thus appropriately switch to different methods as needed. A structured functionalized follow-up mechanism with focal personnel stationed at the postnatal ward or clinic, and SMS reminders seemed to further enhance participants' experience, engagement, interaction and continuity of care.

Adherence can, without a doubt be affected by HCP-related factors such as communication, social support, and patient-related factors such as beliefs about treatment, gender power imbalances, even in settings where healthcare system-wide factors such as access and or treatment cost are greatly minimized [12, 54, 55]. The HCP's skill, beliefs and values could also greatly affect healthcare experiences, decisions and uptake of health services [16, 42, 56]. In our study, HCPs were trained to recognize and respond to demographic and cultural differences among women during interactions and communications to be able to effectively communicate and interact with healthcare seekers, especially those women who find it challenging to make independent decisions about engaging in health care. Our data shows that face-to-face interactions with a culturally competent and sensitive provider that was knowledgeable about cultural issues about family planning and respectfully interpreted health seekers' individual concerns and side effects improved women's willingness to actively participate in their contraception schedules, uptake and use throughout the study period**.** Indeed, this culturally sensitive patient-centered communication has been found to play a key role in health seekers' satisfaction, experience and uptake of healthcare services [57, 58].

Our study had a number of strengths. This study was one of the first attempts to explain how a HCP-led social support intervention influenced contraception choices amongst postpartum WLWH followed up over a 12-months period. This data is aimed at easing interpretation and replication of such social support interventions especially in Uganda and sub-Saharan Africa, where the contextual factors and challenges that drive successful uptake of such reproductive and maternity health services among users differ. We collected our data from WLWH delivering from a publically-funded and operated regional referral hospital in a rural setting with an active postnatal and family planning unit, subject to standard limitations of public sector healthcare facilities in the region. Our intervention was also delivered by nurses and midwives based at the postnatal ward and clinic just like documented by previous studies [56].

Our study also had some limitations. Just like most qualitative studies, we selected a purposive sample from a sample of 320 women followed up over a 12-months period to explore their experiences of the HCP-led social support intervention. As such, the goal of this analysis was not to generalize but rather to provide a deeper contextualized understanding of.

the mechanisms of effect for this HCP-led social support intervention and its dynamic HCP-patient interactions and relationships that influenced choices, uptake and continuous contraception use in a randomized controlled trial amongst postpartum WLWH.

Conclusion

Our findings suggest that sustained HCP-led family planning support including improved information-sharing and follow-up mechanism improves postpartum client awareness, understanding, and use of contraception amongst WLWH in rural southwestern Uganda. Having reference materials on a voucher, plus SMS reminders prompted, engaged and encouraged routine contraceptive use, refills, and ongoing partner discussions. Our adherence support intervention featured a nurse who was empowered, patient, available and culturally-sensitive. She thus responsively and respectfully interacted, engaged and supported participants on an individual level. This individual-level, sensitive, and competent support was a key component that improved appropriate information transfer, women's experience, engagement, satisfaction and, ultimately, contraceptive uptake and continuous use.

This study provides evidence about the key role played by empowered and motivated HCPs to support uptake and adherence to healthcare interventions. Future interventions should focus on empowering and supporting providers to support clients appreciate and navigate through complex socio-cultural and structural barriers to healthcare. Additional future work may clarify how in person versus SMS mechanisms of delivery influences consistent contraception use.

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Declarations

Conflict of interest All authors declare no conflict of interest.

Ethical Approval All human subjects' ethical approvals were obtained from Institutional Review Committees of Mbarara University of Science and Technology (No.10/08–16) and Uganda National Council of Science and Technology, and registered with clinicaltrials.gov (NCT02964169).

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