HHS Public Access

Author manuscript

AIDS Care. Author manuscript; available in PMC 2016 June 01.

Published in final edited form as:

AIDS Care. 2015 June ; 27(6): 743–752. doi:10.1080/09540121.2014.999744.

Integrating Family Planning and HIV Services in Western Kenya: The Impact on HIV-Infected Patients' Knowledge of Family Planning and Male Attitudes Towards Family Planning

Maricianah Onono[a], **Mary A. Guzé**[b], **Daniel Grossman**[b,c], **Rachel Steinfeld**[b], **Elizabeth A. Bukusi**[a], **Starley Shade**[b], **Craig R. Cohen**[b], and **Sara J. Newmann**[b]

[a]Kenya Medical Research Institute (KEMRI), Family Aids Care and Education Services (FACES), Kisumu, Kenya

[b]Department of Obstetrics, Gynecology and Reproductive Sciences, University of California, San Francisco, CA, USA

[c]Ibis Reproductive Health, Oakland, CA, USA

Abstract

Little information exists on the impact of integrating family planning (FP) services into HIV care and treatment on patients' familiarity with and attitudes toward FP. We conducted a cluster-randomized trial in 18 public HIV clinics with twelve randomized to integrated FP and HIV services and six to the standard referral-based system where patients are referred to an FP clinic. Serial cross-sectional surveys were done before (n=488 women, 486 men) and after (n=479 women, 481 men) the intervention to compare changes in familiarity with FP methods and attitudes toward FP between integrated and non-integrated sites. We created an FP familiarity score based on the number of more effective FP methods patients could identify (score range: 0-6). Generalized estimating equations were used to control for clustering within sites. An increase in mean familiarity score between baseline (mean=5.16) and post-intervention (mean=5.46) occurred with an overall mean change of 0.26 (95%CI= 0.09, 0.45; p=0.003) across all sites. At endline, there was no difference in increase of mean FP familiarity scores at intervention versus control sites (mean=5.41 vs. 5.49, p=0.94). We observed a relative decrease in the proportion of males agreeing that FP was "women's business" at integrated sites (baseline 42% to endline 30%; reduction of 12%) compared to males at non-integrated sites (baseline 35% to endline 42%; increase of 7%); aOR=0.43; 95%CI=0.22, 0.85). Following FP-HIV integration, familiarity with FP methods increased but did not differ by study arm. Integration was associated with a decrease in negative attitudes toward FP among men.

Introduction

Integrating FP into HIV services offers an opportunity to provide FP information and services to women and men of reproductive age who are living with HIV as well as reduce negative attitudes towards contraception. Studies show that although individuals living with

Corresponding Author Onono Maricianah Atieno MBChB MSc, Fogarty Global health fellow, Kenya Medical Research Institute, maricianah@yahoo.com, Fax: +254 57 2021945, Phone: +254 732 390 992.

HIV vary in their desire for more children (Cooper et al., 2009; Kaida et al., 2011; Nattabi, Li, Thompson, Orach, & Earnest, 2009), in the absence of counseling and FP method provision, high rates of unplanned pregnancies occur (King et al., 1995; Schwartz et al., 2012) particularly in an environment where low contraceptive use and cultural constructs that support high fertility are prevalent (Grabbe et al., 2009). Several studies in sub-Saharan Africa (SSA) have highlighted that male partners' negative attitudes towards contraception have an inhibiting effect on a woman's ability to adopt a method of contraception (Agadjaian, 2002; Agha, 1998; Mbizvo & Adamchak, 1991; Singh, 1998). This barrier may be more pronounced in HIV patients since the negative attitudes towards contraception may be further compounded by the negative perceptions about their own health status (Grabbe et al., 2009). Integration of FP and HIV services may result in decreasing negative attitudes among males towards contraception by being able to facilitate male involvement in FP more easily since men present to HIV clinics for their own care (Newmann et al., 2013).

To date, few studies have described the effect of integration on familiarity with FP and the opportunity that integration of FP and HIV services provides to affect negative male attitudes towards FP. In this study we assess the impact of integrating FP and HIV services on HIV-infected men and women's familiarity with FP methods and HIV-infected men's attitudes towards women using FP in a high HIV prevalence population. We hypothesize that integrating FP and HIV services will be positively associated with increased familiarity with FP methods and a reduction in negative male attitudes towards FP.

Methods

Ethics statement

The Committee on Human Research at UCSF and the Ethical Review Committee at KEMRI approved this study. The study was registered with clinicaltrials.gov, NCT01001507. Written consent was obtained from individual patients to contribute data to the study; de-identified data were used in the analysis.

Study design

This study was nested within a cluster-randomized control trial (RCT), which evaluated the impact of integrating FP services into HIV services on contraceptive prevalence. The RCT utilized a 2:1 randomization strategy of integration sites to control sites. The 2:1 ratio was selected to respond to the Kenya Ministry of Health's interest in moving forward with integration. We evaluated FP knowledge, attitudes and perceptions among HIV-infected men and women using a cross-sectional pre- and post-intervention design. More information on study methods is available elsewhere (Grossman et al., 2013)

Study sites and participants

The study was conducted at 18 HIV clinics in the Nyanza Region. Eligible sites were public sector HIV clinics in Kisumu, Migori and Homabay Counties of Nyanza Province, Kenya. The Family AIDS Care & Education Services (FACES) program supported all sites (Lewis Kulzer et al., 2012). Participants were included if they met the following criteria: 1) HIV-positive woman or man obtaining HIV care at the FACES-supported public HIV clinic, 2)

not currently pregnant (if female), 3) age 18 to 45 years old, and 4) willing and able to give informed consent. At baseline, a total of 974 patients were surveyed and 960 patients were surveyed at endline.

Procedures

We conducted a baseline survey from June to August 2009, during a three-month period prior to intervention implementation, and an endline survey approximately 12 months later during the final three months of the study from July to September 2011. The sample size was based on the ability to detect at least a ten percent point difference in contraceptive knowledge between unique participants at intervention sites versus those at comparison sites. For a one-sided test of two proportions using two samples, power of 0.8, and an alpha level of 0.05, the required sample size was 325 patients from the intervention sites (12) and 163 patients from the comparison sites (6) for both men (N=488) and women (N=488), equaling approximately 28 men and 28 women from each study site. Convenience sampling was used to select participants. For both surveys, a questionnaire regarding knowledge, attitudes and practices (KAP) related to FP was administered. The surveys were administered face-to-face by an interviewer in the respondent's preferred language (Dholuo, Kiswahili, or English) in a private area of the health facility. The survey was adapted from the Demographic and Health Survey modules on contraception, marriage and sexuality, and fertility preferences (Kenyan National Bureau of Statistics, 2010)

Intervention

In collaboration with the Kenyan Ministry of Health we initiated a FP-HIV integration intervention that had four pillars namely: patient education, provider training and counseling, method provision and systems strengthening, and monitoring and evaluation. HIV clinics assigned to the intervention [full integration (FI)] integrated FP counselling and method provision, including all reversible FP methods (barrier, hormonal and intrauterine), within the HIV clinic. Non-integrated (NI) facilities referred patients interested in FP to a separate maternal child and FP clinic that was the current standard of care. In both FI and NI sites Clinic and Community Health Assistants (CCHAs), provided health talks about FP in the waiting bay while patients waited to be seen (Onono et al., 2014) and trained nurses provided the FP methods. As such, patients at all FI and NI sites were exposed to information about FP. The intervention lasted twelve months.

Main outcome measures

Patients' familiarity with more effective FP methods was obtained based on responses to the question "Which ways or methods [of FP] have you heard about?" More effective FP methods in this study refer to tubal ligation, vasectomy, subdermal implants, injectable progestins, intrauterine devices and oral contraceptive pills. For the purpose of analysis, a knowledge score was created based on the number of 'yes' responses. Scores could range from 0 (never heard of any of the 6 methods) to 6 (heard of all 6 methods). These scores were then scaled up to 0-100 in order to better indicate the change in score percentage from baseline to endline.

Male attitudes toward FP were ascertained based on male patient's responses to two statements, "Contraception is women's business and a man should not have to worry about it" and "Women who use contraception may become promiscuous." Men could respond, "agree," "disagree," or "don't know."

Patient characteristics examined in the study included age, educational attainment, relationship status, disclosure of patient's HIV status to his or her partner. Health markers assessed were self-reported health status (good, fair, poor), number of living children, and future fertility preferences.

Statistical Methods

Questionnaire data was stored in Microsoft Access Version 2007 (Microsoft Inc., Redmond, WA) and records were extracted to SAS Version 9.2 (SAS Institutes Inc., Cary, North Carolina, USA), which was used for all further data management and statistical analysis. All independent variables were reported using frequencies and proportions. Since this trial was randomized by site, analyses for all dependent variables were completed using generalized estimating equations (GEE). This method accounts for any covariance between independent variables due to clustering (LIANG & ZEGER, 1986). GEE were used to estimate proportions and detect differences in the change of familiarity scores between FI and NI from baseline compared to endline. The dependent variable for the knowledge score analysis was the knowledge score (0-100 scale). The knowledge scores were scaled up to 0-100 in order for the GEE equation to provide information on total percentage change in score. The GEE estimating change in knowledge score adjusted for all independent variables. GEE were also used to estimate proportions and detect differences in the change of attitudes toward FP between men at FI sites versus NI sites from baseline compared to end of the study period. For the purposes of analysis, we examined only men who responded either 'agree' or 'disagree' as the response 'don't know' had low response levels and was also ambiguous.

For both these analyses the independent variables were: age, educational attainment, relationship status, disclosure of HIV status to partner, self-reported health status, number of living children, and desired fertility delay. The GEE equation for this analysis provided an odds ratio and 95% confidence intervals (CI), since the dependent variable was binomial in nature. The odds ratio was adjusted for all independent variables. Adjusted odds ratios were considered statistically significant at a p-value less than 0.05.

Results

Baseline characteristics of respondents

Figure 1 shows the number of participants' surveys analyzed at baseline. Overall baseline patient characteristics between FI and NI sites were similar (see Table I). Among all participants, most were >26 years old, however, male participants were older than the female participants. A higher number of males reported being married than females. While the majority of both genders reported their main partner was HIV positive, males reported higher levels of their main partner being HIV negative compared to females, whereas

females reported higher levels of not knowing their partners' HIV status. Males reported higher levels of disclosure of their HIV status than females. Males and females also reported differences in desired fertility delay; more males than females reported wanting to have a child within the next 2 years.

Factors associated with FP method familiarity

Baseline knowledge scores among women and men were relatively high (see Figures 2a, 2b and 2c). Females and males at FI and NI sites had mean knowledge scores of >80 at baseline (0-100 scale), indicating they were familiar with approximately five out of six FP methods asked. We observed a statistically significant increase of 6.32 points (95% CI 2.67-9.97, p-value<0.001) between baseline and endline in mean knowledge score among women (see Figure 2b and Table II). However, the mean change in knowledge score among women did not differ between FI and NI sites. Among men, mean change in knowledge score was not statistically significant over time, or between FI and NI sites (see figure 2a).

The significant factors associated with knowledge score were different between males and females (Table II). Among both men and women, higher education was a significant predictor of higher knowledge score. Among males, disclosure of HIV status to partner was also a significant predictor for male higher knowledge score. In women, younger age and being single were significantly associated with lower knowledge score. Health status was a significant predictor of lower score among both men and women. Poor health status compared to good health status was significantly associated with lower score among men, while fair health status compared to good health status was associated with lower score among women.

Factors associated with changes in negative male attitudes towards FP

We observed a relative decrease in the proportion of males agreeing that FP was "women's business" at FI sites compared to males at NI sites (see Figure 3, Table III).

Significant predictors for being more likely to disagree with the statement, 'FP is women's business' included higher education and disclosure of HIV status to partner. Significant predictors for being more likely to agree with the statement included poor or fair health status compared to good health status (see Table III).

There was a relative, though non-significant, decrease in the proportion of males agreeing that FP was associated with promiscuity at FI sites compared to males at non-integrated sites (see Figure 4, Table IV). The significant predictors for disagreeing with the statement, 'FP is associated with promiscuity' included higher education and disclosure of HIV status to partner. Significant predictors for agreeing with the statement included younger age and poor health status compared to good health status (see Table IV).

Discussion

Integration of FP into HIV services provides the unique opportunity to provide sexually active men and women who are HIV-infected with correct information, quality services and timely access to safe, effective modern contraception. We observed a small but significant

increase in mean FP familiarity scores among women post intervention, yet no association between integration status and FP familiarity score. The lack of observed impact of integration status on FP familiarity may be attributed to the high baseline levels of knowledge familiarity in both arms (~80%) and the fact that during the intervention phase the participants in the NI sites were also exposed to FP education and counseling. Unfortunately a high level of contraceptive awareness does not always translate into high CPR (Omo-Aghoja et al., 2009; Solomon Avidime, 2010) particularly in HIV-infected patients where the common barriers to use of contraception such as, lack of female decision-making power (Chapagain, 2005), poor economic resources (Stephenson & Tsui, 2002), low-quality care of FP services (Hamid & Stephenson, 2006), and desire for large families (Singh, 1998) may be more pronounced.

Studies show improvements in uptake of contraception when men are involved in FP (Isaiah Ndong, 1999). As such there has been an intense interest to increase information about FP, encourage condom use and address men's roles in FP. However, knowledge of FP methods in the absence of positive attitudes towards FP may not necessarily foster adoption and utilization. In a patriarchal society such as in many countries in SSA there must be a deliberate effort to move beyond increasing knowledge to changing male attitudes and practices while empowering women at the same time. The majority of HIV clinics in SSA do not segregate male and female patients. This setting thus provides a unique one-stop opportunity to integrate conversations about FP with men among their peers and with women. In such forums and in the presence of a trained health care worker, more in-depth information can be discussed and "peer-reviewed" to create a supportive and enabling environment for uptake of FP. Among persons living with HIV, integration of FP into HIV services as demonstrated in this study may have the potential to reduce negative attitudes towards contraception. Our study showed a relative decrease in the proportion of males agreeing that FP is a woman's business at FI sites compared to males at NI sites. This is particularly important in an environment in which male desires for large numbers of children and high HIV prevalence may co-exist.

One of the predictors of positive attitudes toward FP included disclosure of HIV status. Conversely poor health status was a strong predictor of negative attitude towards FP. Individuals who disclose their status may be in a better position to make reproductive choices including use of contraception in an HIV clinic compared to a FP clinic (Steinfeld et al., 2013). In addition, disclosure facilitates other behaviors that may improve the management of HIV including adherence to drugs and better health outcomes (Deribe, Woldemichael, Wondafrash, Haile, & Amberbir, 2008; Pinkerton & Galletly, 2007; Waddell & Messeri, 2006). Similarly, people with HIV who are feeling well, as a result of treatment, are also likely to be in a better position to make reproductive health decisions which can be further facilitated by receiving HIV care and treatment and FP services in the same clinic. Lack of sexual health services and information places young people at high risk for pregnancy, abortion, HIV/AIDS and sexually transmitted diseases. In this study young age was a predictor of poor FP knowledge among women and negative male attitudes in this population. This highlights the need for current programs to go beyond traditional FP counseling and teaching techniques to discuss how to improve communication with partners

and other lifestyle issues that may interfere with consistent use among young persons particularly those that are HIV infected.

This study had several limitations. The participants analyzed in this study may not be representative of the general HIV-infected adult population in Kenya. The data shown are taken from a convenience sample of men and women living with HIV attending HIV services in public health facilities. Additionally, the survey evaluated FP method familiarity by asking patients which FP methods they had heard of. Knowledge of the name of a method may not translate into actual knowledge of how that method works, what the side effects are, how it is administered. The lack of observed impact of integration status on FP familiarity may be attributed to contamination bias arising from the fact that during the intervention phase the participants in the NI sites were also exposed to FP education and counseling. The association observed between male attitudes and integrated FP/HIV services might have been stronger if the intervention included a specific module on gendered attitudes about FP,. Admittedly, the serial cross-section design does not allow us to look at intra-individual and inter-individual changes over time. However, since the intervention and randomization were applied at the clinic level, a serial rather than a longitudinal approach was important to capture information at the level of the clinic. Despite these limitations, the data presented here are a unique opportunity to understand the potential impact of integrating FP into HIV services on contraceptive knowledge and attitudes among HIV-infected reproductive-age men and women.

Ultimately the use of FP is inherently a product of correct knowledge about, cultural acceptance by both men and women of and access to available contraceptive methods. FP education can increase FP familiarity even in settings where persons appear to be already well informed. Additionally FP/HIV integration may help to decrease some negative male attitudes towards FP, which may in turn help increase FP uptake by women over time. In addition to increasing access to FP methods, our findings depict the importance of including education about FP methods and efforts to increase awareness of and modify preconceived negative gendered attitudes about FP as components of FP/HIV integrated services.

Acknowledgments

Funding

This work was supported by The Bill & Melinda Gates Foundation (http://www.gatesfoundation.org/) grant number OPPGH5361), and the Tides Africa Fund (http://www.tides.org/impact/fund-initiative-spotlight/tides-africa-fund/, grant numbers TFR10–01364 and TFR08–02986). Dr Newmann was supported by the National Center for Advancing Translational Sciences, National Institutes of Health through UCSF-CTSI grant number KL2TR000143.

We thank the Kenyan women and men who participated in the study. We acknowledge the important logistical support of the KEMRI-UCSF Collaborative Group and especially Family AIDS Care and Education Services (FACES). We gratefully acknowledge the Director of KEMRI, the Director of KEMRI's Centre for Microbiology, and the Nyanza Provincial Ministries of Health and the provincial and district reproductive health coordinators for their support in conducting this research. We also thank Pauline Wekesa, Wanjiku King'ori, Gorrety Ongundi, Janet Opiyo, Phoebe Adhiambo, Christine Oray, Mercy Wanjiku, Violet Nasenya, and George Ochieng' for their important contributions to this research.

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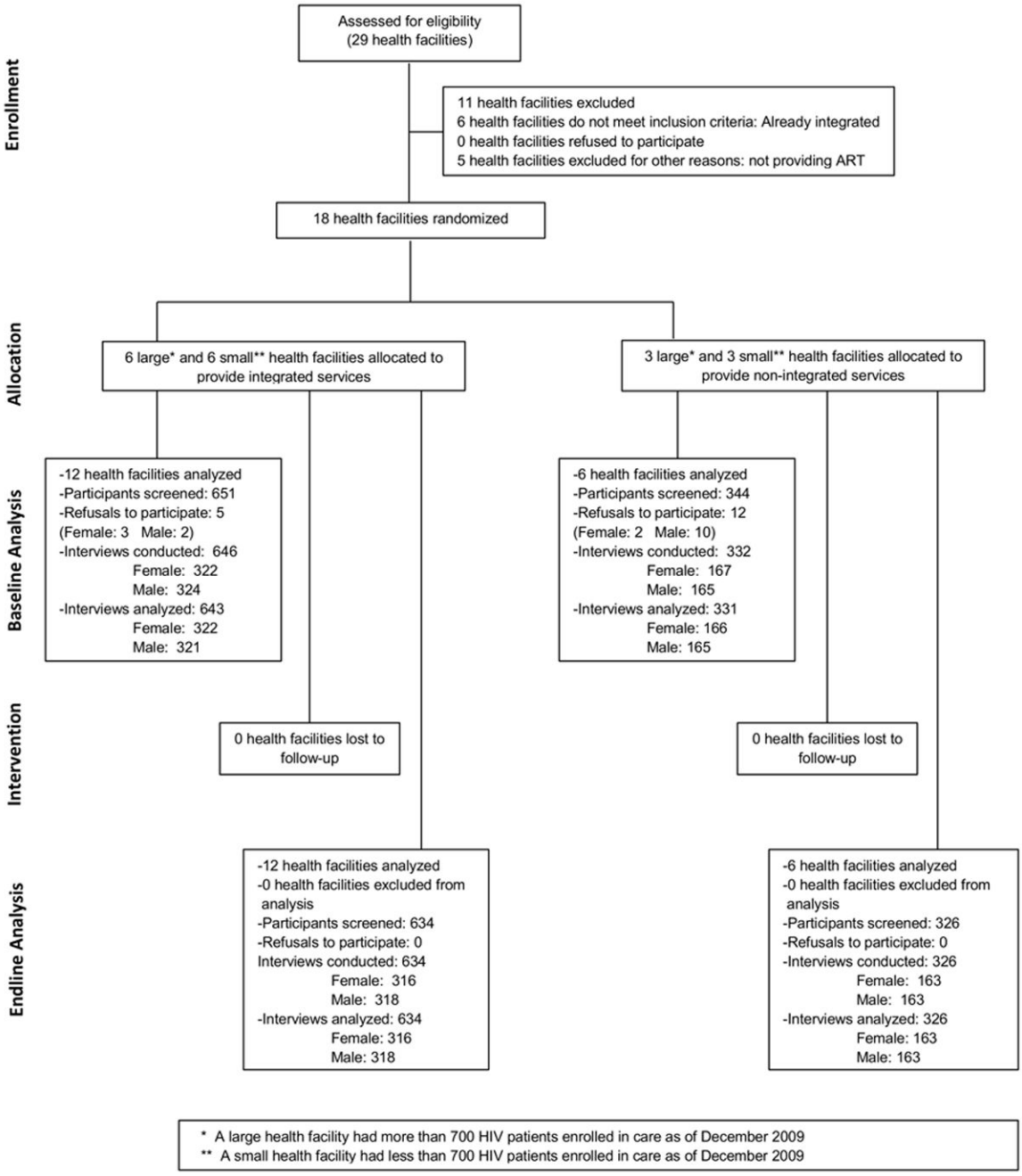

Figure 1.
CONSORT flow diagram: Trial profile

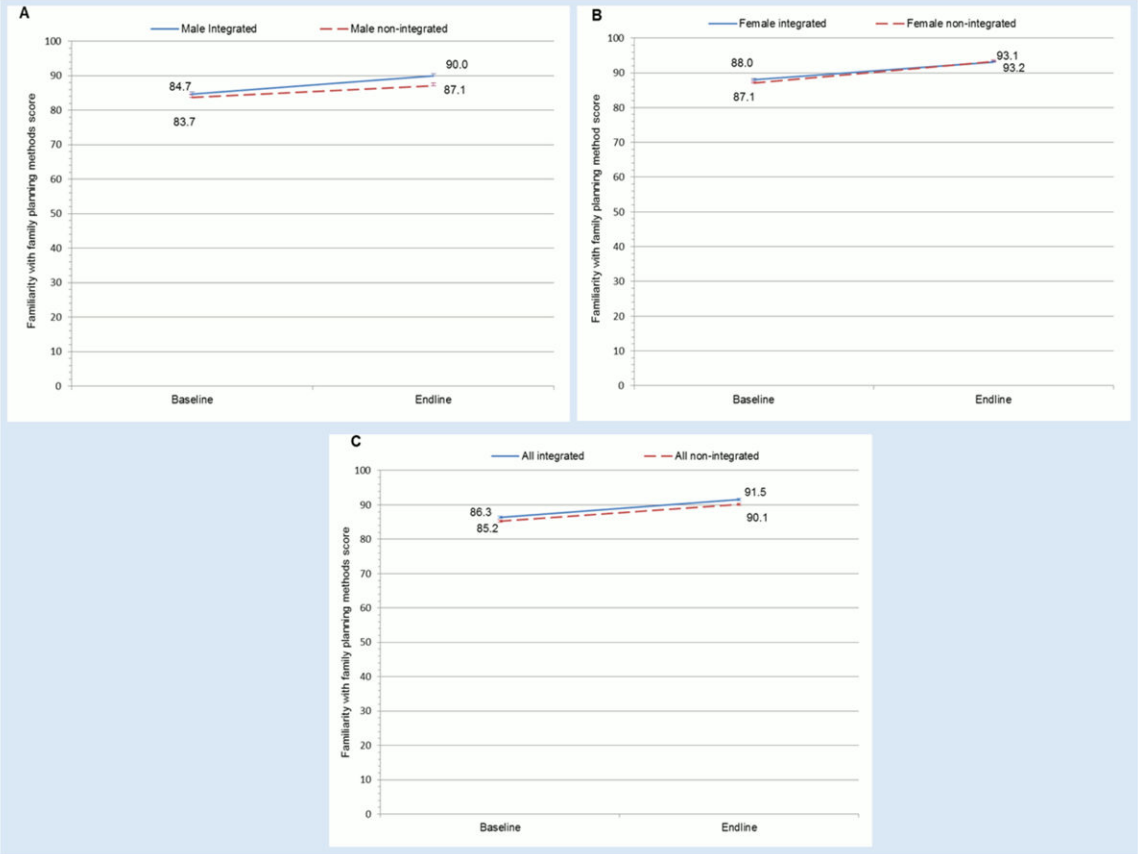

Figure 2.

a: Familiarity with FP methods score (0-100 scale) between integrated and non-integrated sites from beginning to end of study among males (N=944).

b: Change in familiarity with FP score (0-100 scale) between integrated and non-integrated sites from beginning to end of study among females (N=954).

c: Change in familiarity with FP score (0-100 scale) between integrated and non-integrated sites from beginning to end of study among all participants (N=1898).

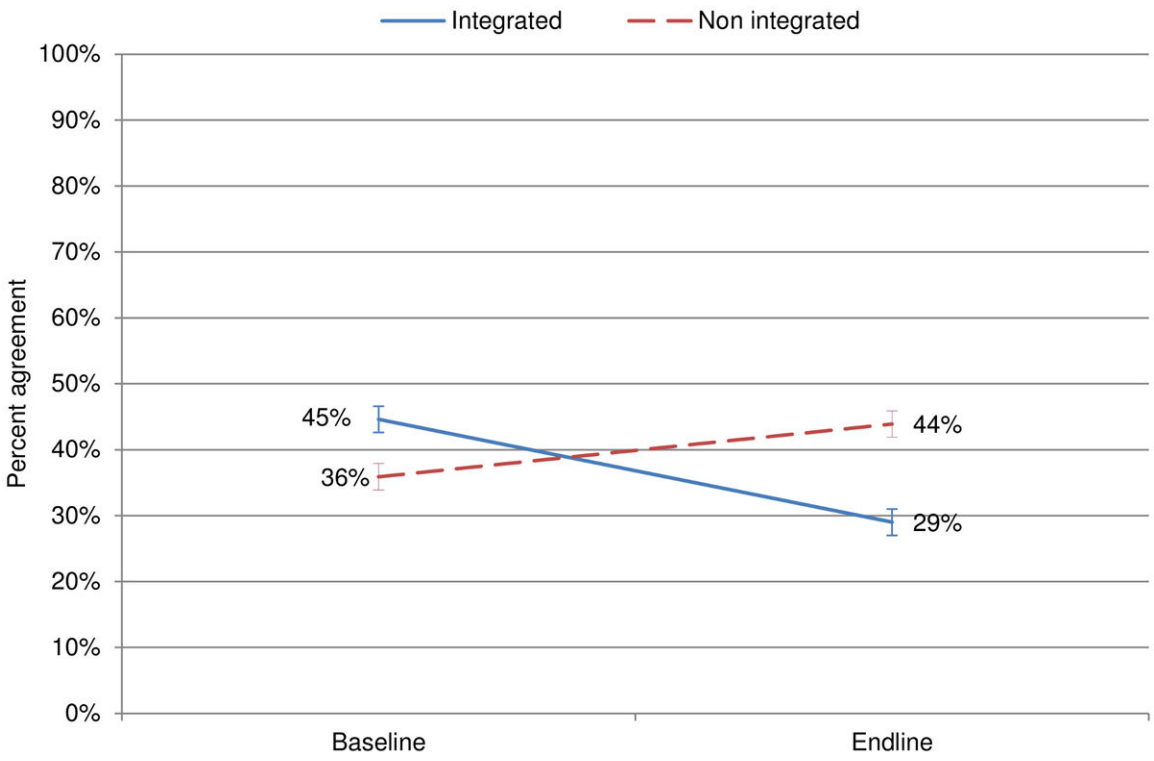

Figure 3.

Change in male agreement with statement "FP is a woman's business" between integrated and non-integrated sites during study period (N=929).

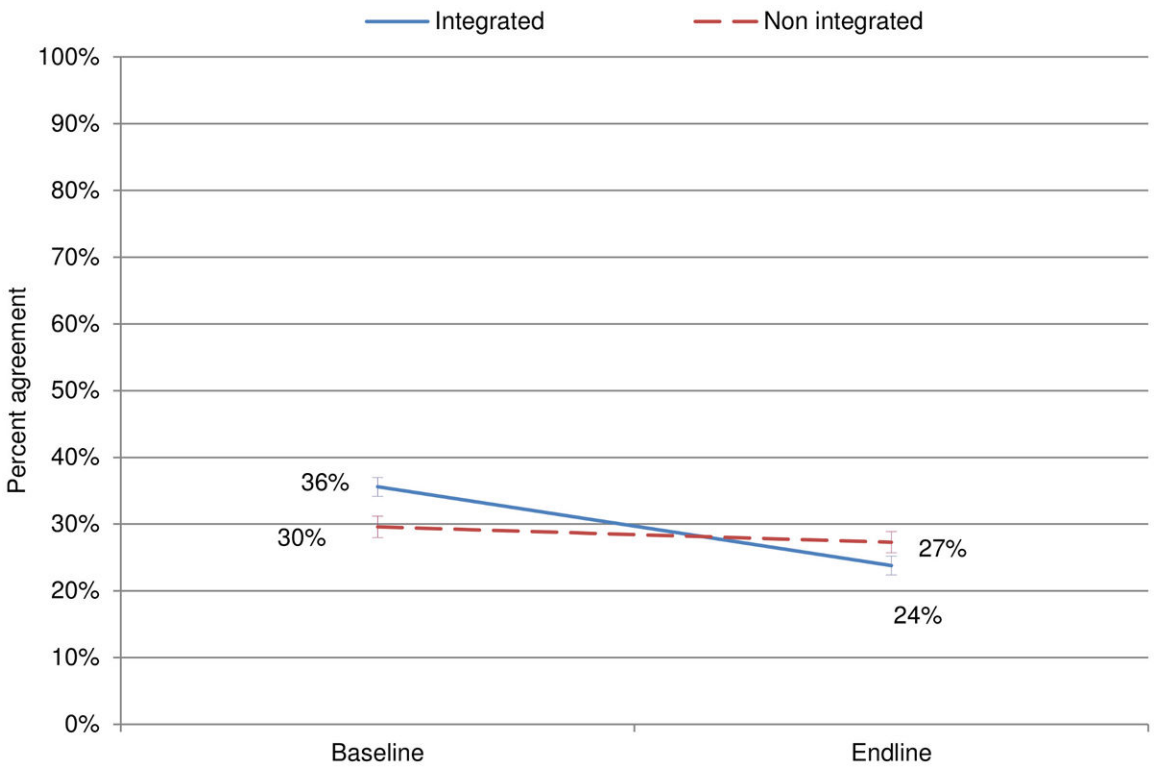

Figure 4.
Change in male agreement with statement "FP is associated with promiscuity" between integrated and non-integrated sites during study period (N=819).

Table I

Baseline patient characteristics

	Males		Females		All	
Measure	**Integrated n=321 (%)**	**Non-integrated n=165 (%)**	**Integrated n=322 (%)**	**Non-integrated n=166 (%)**	**Integrated n=643**	**Non-integrated n=331**
Age (years)						
18 – 25	28 (8.7)	23 (13.9)	85 (26.5)	47 (28.3)	113 (14.6)	70 (21.1)
26 – 34	118 (36.9)	66 (40.0)	156 (48.6)	80 (48.2)	274 (42.7)	146 (44.1)
35+	174 (54.4)	76 (46.1)	80 (24.9)	39 (23.5)	254 (39.6)	115 (34.7)
Highest educational level attained						
None or primary	239 (74.4)	114 (69.1)	269 (83.5)	145 (87.4)	508 (79.0)	259 (78.2)
Secondary or greater	89 (25.6)	51 (30.9)	53 (16.5)	21 (12.6)	135 (21.0)	72 (21.7)
Covered floors in home	50 (15.6)	24 (14.5)	71 (22.0)	28 (16.9)	121 (18.8)	52 (15.7)
Household has a cell phone	168 (52.5)	86 (52.1)	148 (46.0)	77 (46.4)	316 (49.2)	163 (49.2)
Relationship status						
Single	22 (6.9)	23 (13.9)	51 (15.8)	24 (14.6)	73 (11.4)	47 (14.3)
Living together	---	---	14 (4.4)	9 (5.5)	14 (2.2)	9 (2.7)
Girlfriend/Boyfriend	16 (5.0)	14 (8.5)	31 (9.6)	16 (9.8)	47 (7.3)	30 (9.1)
Married	281 (88.1)	128 (77.6)	226 (70.2)	115 (70.1)	507 (79.1)	243 (73.9)
HIV status main partner						
HIV-positive	200 (67.6)	90 (63.8)	167 (63.5)	79 (58.5)	169 (61.2)	367 (65.7)
HIV-negative	55 (18.6)	28 (19.9)	24 (9.1)	17 (12.6)	45 (16.3)	79 (14.1)
Don’t know	41 (13.8)	23 (16.3)	72 (27.4)	39 (28.9)	62 (22.5)	113 (20.2)
Disclosed to partner	266 (84.4)	131 (80.4)	213 (66.6)	111 (66.9)	479 (75.4)	242 (73.6)
Reported health status						
Good	195 (61.1)	89 (54.3)	210 (65.4)	107 (64.5)	405 (63.3)	196 (59.4)
Fair	100 (31.4)	61 (37.2)	100 (31.2)	55 (33.1)	200 (32.2)	116 (35.2)
Poor	24 (7.5)	14 (8.5)	11 (3.4)	4 (2.4)	35 (5.5)	18 (5.4)
Number of living children						
0	22 (6.9)	27 (16.4)	31 (9.7)	17 (10.3)	53 (8.3)	44 (13.3)
1 – 3	166 (51.7)	80 (48.5)	189 (58.9)	89 (53.9)	355 (55.3)	169 (51.2)
≥ 4	133 (41.4)	58 (35.1)	101 (31.5)	59 (35.8)	234 (36.4)	117 (35.4)

Measure	Males		Females		All	
	Integrated n=321 (%)	Non-integrated n=165 (%)	Integrated n=322 (%)	Non-integrated n=166 (%)	Integrated n=643	Non-integrated n=331
Number of children infected with HIV[a]						
0	259 (87.2)	120 (85.1)	210 (71.2)	115 (74.2)	469 (79.2)	235 (79.4)
≥ 1	38 (12.8)	21 (14.9)	85 (28.8)	40 (25.8)	123 (20.8)	60 (20.6)
Desired fertility delay						
0 – 2 years	65 (20.8)	48 (29.6)	61 (19.0)	29 (17.6)	126 (19.9)	77 (23.6)
> 2 years	43 (13.7)	29 (17.9)	51 (15.9)	25 (15.1)	94 (14.8)	54 (16.5)
Does not prefer to have any more children	171 (54.6)	64 (39.5)	173 (53.9)	97 (58.8)	344 (54.3)	161 (49.2)
Other	34 (10.9)	21 (13.0)	36 (11.2)	14 (8.5)	70 (11.0)	35 (10.7)

[a] of patients who have ever had children

Table II

Factors associated with familiarity with family planning methods among males and females over time, pre- and post family planning intervention

	Males (n=944)		Females (n=954)		All (n=1898)	
Variable	**β, (95% CI)**	**p-value**	**β, (95% CI)**	**p-value**	**β, (95% CI)**	**p-value**
Interaction of time and integration Status	1.05 (-6.01, 8.10)	0.77	-1.85 (-7.26, 3.55)	0.50	-0.42 (-6.52, 5.67)	0.89
Time[a]	3.13 (-2.60, 8.86)	0.28	6.32 (2.67, 9.97)	<0.001	4.83 (-0.00, 9.66)	0.05
Integration Status	0.74 (-2.03, 3.51)	0.60	0.85 (-2.52, 4.22)	0.62	0.75 (-1.91, 3.40)	0.58
Gender						
Male	…	…	…	…	-4.83 (-6.69, -2.96)	<0.001
Female	…	…	…	…	1.00	ref
Age						
18-24	-0.15 (-4.44, 4.13)	0.94	-3.56 (-5.77, -1.35)	0.001	-2.76 (-4.92, -0.60)	0.01
25-34	-2.47 (-5.86, 0.92)	0.15	-1.39 (-3.86, 1.07)	0.27	-2.14 (-4.62, 0.33)	0.09
35+	1.00	Ref	1.00	ref	1.00	ref
Higher education	5.59 (3.17, 8.01)	<0.001	2.14 (0.36, 3.91)	0.02	4.34 (2.85, 5.84)	<0.001
Relationship Status						
Single	1.63 (-5.98, 0.91)	0.67	-4.99 (-7.90, -2.09)	<0.001	-2.03 (-4.49, 0.43)	0.11
Living together	-1.20 (-10.85, 8.44)	0.81	-2.64 (-7.51, 2.24)	0.29	-2.37 (-6.22, 1.49)	0.23
Girlfriend/Boyfriend	0.56 (-6.45, 7.56)	0.88	-1.03 (-4.21, 2.14)	0.52	-0.22 (-3.32, 2.88)	0.89
Married	1.00	ref	1.00	Ref	1.00	ref
Disclosed HIV Status to partner	6.17 (0.46, 11.88)	0.03	-1.48 (-3.26, 0.29)	0.10	1.48 (-1.48, 4.44)	0.33
Health Status						
Poor	-11.99 (-17.63, -6.34)	<0.001	-1.28 (-5.51, 2.94)	0.55	-8.22 (-12.24, -4.19)	<0.001
Fair	-2.12 (-4.51, 0.27)	0.08	-3.40 (-4.94, -1.86)	<0.001	-2.73 (-4.43, -1.03)	0.002
Good	1.00	ref	1.00	Ref	1.00	ref
Number of living children						
0	1.00	ref	1.00	Ref	1.00	ref
1-3	2.09 (-3.48, 7.67)	0.46	1.49 (-2.01, 4.99)	0.40	1.95 (-0.57, 4.47)	0.13
≥4	2.45 (-4.63, 9.53)	0.50	0.25 (-3.33, 3.84)	0.89	1.61 (-1.54, 4.77)	0.32
Desired fertility delay						
0-2 years	0.33 (-2.40, 3.07)	0.81	-1.09 (-3.77, 1.60)	0.43	-0.45 (-2.21, 1.30)	0.61

	Males (n=944)		Females (n=954)		All (n=1898)	
Variable	**β, (95% CI)**	**p-value**	**β, (95% CI)**	**p-value**	**β, (95% CI)**	**p-value**
>2 years	-0.14 (-3.32, 3.05)	0.93	-0.99 (-4.29, 2.31)	0.55	-0.66 (-2.81, 1.49)	0.55
Other	-1.37 (-5.52, 2.67)	0.52	-4.76 (-9.49, -0.02)	0.05	-2.80 (-5.71, 0.11)	0.06
No more children	1.00	ref	1.00	ref	1.00	ref

Analysis conducted with multiple linear regression, utilizing generalize estimating equations; knowledge scores on a 0-100 scale

[a]Variable 'Time' is defined as end of study period compared to baseline

Table III

Factors associated with change in male agreement that FP is a woman's business from beginning to end of study period (N=929)

Variable	aOR, (95% CI)	p-value
Interaction of time and integration Status	0.43 (0.22, 0.85)	0.02
Time	1.39 (0.92, 2.07)	0.12
Integration Status	1.38 (0.65, 2.98)	0.39
Age		
18-24	1.23 (0.67, 2.24)	0.50
25-34	0.84 (0.56, 1.25)	0.38
35+	1.00	ref
Higher education	0.39 (0.29, 0.52)	<0.001
Relationship Status		
Single	0.80 (0.44, 1.48)	0.48
Living together	1.98 (0.54, 7.32)	0.30
Girlfriend	0.68 (0.32, 1.45)	0.32
Married	1.00	ref
Disclosed HIV Status to partner	0.38 (0.22, 0.64)	<0.001
Health Status		
Poor	3.36 (1.65, 6.87)	<0.001
Fair	1.30 (1.04, 1.61)	0.02
Good	1.00	Ref
Number of living children		
0	1.00	Ref
1-3	1.15 (0.68, 1.96)	0.59
≥4	1.40 (0.72, 2.69)	0.32
Desired fertility delay		
0-2 years	1.39 (0.99, 1.94)	0.05
>2 years	1.15 (0.79, 1.67)	0.46
Other	1.03 (0.64, 1.64)	0.91
No more children	1.00	Ref

Analysis conducted with multiple logistic regression, utilizing generalize estimating equations

Table IV

Factors associated with change in male agreement that 'family planning is associated with promiscuity' (N=819)

Variable	aOR, (95% CI)	p-value
Interaction of time and integration status	0.65 (0.34, 1.22)	0.18
Time	0.92 (0.55, 1.52)	0.74
Integration Status	1.54 (0.85, 2.78)	0.15
Age		
18-24	1.66 (1.06, 2.58)	0.02
25-34	0.96 (0.63, 1.45)	0.83
35+	1.00	Ref
Higher education	0.62 (0.48, 0.80)	<0.001
Relationship Status		
Single	0.76 (0.44, 1.33)	0.34
Living together	1.56 (0.32, 7.67)	0.58
Girlfriend	0.81 (0.35, 1.91)	0.63
Married	1.00	Ref
Disclosed HIV Status to partner	0.47 (0.30, 0.72)	<0.001
Health Status		
Poor	2.72 (1.62, 4.58)	<0.001
Fair	1.39 (0.94, 2.04)	0.09
Good	1.00	Ref
Number of living children		
0	1.00	Ref
1-3	1.94 (0.93, 4.06)	0.08
≥4	1.87 (0.80, 4.35)	0.15
Desired fertility delay		
0-2 years	1.02 (0.66. 1.57)	0.92
>2 years	1.02 (0.66, 1.58)	0.93
Other	1.35 (0.80, 2.27)	0.26
No more children	1.00	Ref

Analysis conducted with multiple logistic regression, utilizing generalize estimating equations