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Original Research Article

Effectiveness of Clinician Client Centered Counseling on Condom Use and Status Disclosure of Adult HIV Positive Patients Enrolled In Care in Yola, Nigeria: A Randomized Clinical Trial

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ABSTRACT

This study assessed the effectiveness of a developed and implemented Clinician Client Centered Counseling Module on improving condom use and increasing HIV status disclosure to spouses and or sex partners of adult patients living with HIV enrolled in care in Yola, Nigeria.

The study was a three arm randomized single blind clinical trial involving 386 randomly selected and allocated adult patients living with HIV who were enrolled into ART care at any of the four comprehensive ART sites in Yola. A clinician client centered training module was developed based on the Information Behavior and Motivation (IBM) Model. Nine Clinicians involved in ART care were trained with this module to deliver a 10 to 15 minutes clinic based intervention (Clinician Client Centered counseling). Intervention group one received two counseling sessions; at baseline and at two month, intervention group two received a counseling session at baseline and the control group received routine care. An interviewer administered structured questionnaire was used for data collection. Data was collected at baseline, two months and six months. Outcome measures were condom use and HIV status disclosure. Data was analyzed using SPSS version 22.

At six months a significantly higher median condom use score was seen in intervention group one compared to intervention group two (1.00 vs 0.50; p = 0.01), and in intervention group one compared to the control group (1.00 vs 0.00; p = 0.01). A significant change in median condom use scores from baseline to 6 months was seen for intervention group one (p = 0.02). At six months a significantly higher mean HIV status disclosure was seen in intervention group one compared to the control group (0.30 vs 0.25; p = 0.01) and in the intervention group two compared to the control group (0.30 vs 0.25; p = 0.01). A significant main effect for time was seen for HIV status disclosure to spouse and/or sexual partners (p = 0.01).

Clinician Client Centered counseling is an effective behavioral intervention in improving condom use and status disclosure of adult patients living with HIV.

Keywords: Counseling; Behavioral intervention; Condom use; HIV status disclosure; adult patients living with HIV; Nigeria.

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INTRODUCTION

HIV/AIDS is recognized as a major challenge to public health in recent times. An estimated 34.0 million people are presently known to be living with HIV/AIDS globally. This epidemic varies considerably between countries and regions and despite the concerted efforts of the global community Sub –Saharan Africa remains at the epicenter of the pandemic. Nearly 1 in 20 adults (4.9%) are living with HIV in Sub- Saharan Africa and these accounts for about 69% of the global burden. [1]

Nigeria has a HIV prevalence of 3.4%. [2] This prevalence accounts for about 3.2 Million Nigerians out of which 2.8 Million are aged 15 years and above. [2] Adamawa state with Yola as capital, located in the north-eastern region has a prevalence of 1.9%. [2]

The primary mode of transmission of HIV in Nigeria is heterosexual sex accounting for about 80-95% of HIV infection in the country. [3] Bearing this in mind, it is appalling that a prevalence as low as 4% prevalence of male condom use in last non marital sexual act has been reported. [4]

There is a paucity of intervention studies among PLWHAs in Nigeria. Studies carried out show a wide variation in condom use among this group of people. As low as 14% of HIV positive patients newly enrolled in ART care reported condom use during sexual activity at commencement of antiretroviral therapy in south west of the country. [5] Among HIV positive patients receiving care in a general hospital in Iquita, Akwa Ibom State (South South Nigeria); 38% of respondent did not use any means to protect their sexual partners and prevalence of condom use among this group of patients was 23.4%. [6] A prevalence of 69.5% of unprotected sexual intercourse was reported between HIV concordant and HIV non concordant sexual partners by both men and women with prevalence of condom use in the last sexual act as low as 30.5%. [7] About fifty eight percent (58.2%) prevalence of regular condom use was reported among PLWHAs receiving ART care at a general hospital in Kogi State (North Central Nigeria). [8]

Recently the Centers for Disease Control and Prevention (CDC) announced that it would change its old language of "unprotected sex" to "condomless sex". [9] Looking at the term "protected sex" HIV experts talk about treatment as prevention (TasP). [9] Also Pre exposure prophylaxis (PrEP) for sero- discordant couples has been shown to reduce the risk of an uninfected partner becoming infected by 75%. [9] However this two means of protection are unavailable in Nigeria. Individuals on antiretroviral therapy who often have undetected viral load, though still having the possibility to transmit HIV are less likely too. [9] Thus condom use during sexual intercourse remains an important means of preventing HIV spread between adult patients living with HIV and their sex partners who are HIV negative or of unknown status in Nigeria.

Behavioral interventions in the form of counseling have been shown to improve condom use among adult patients living with HIV. [10,11] Other benefits of condom use such as reducing the incidence of sexually transmitted infections (STIs) have been reported. [12,13]

HIV status disclosure helps to reduce the transmission of HIV by raising awareness and decreasing risky behavior. Another benefit of status disclosure is that it improves drug adherence, this is even of more benefit in respect to TasP. Status disclosure to spouses and/or sexual partners in Nigeria is still relatively low. About nineteen percent (18.6%) of PLWHAs enrolled in care at a teaching hospital in the north central area of the country reported they had disclosed their HIV status to a spouse and /sex partner. [14] A higher rate of disclosure though, has been reported among PLWHAs attending secondary health facilities in Ogun state (South West Nigeria) in which 50.9% of the 637 respondents indicated they had disclosed their HIV

status to their main sexual partner. [15]

In the past, strategies for HIV prevention focused on HIV negative individuals or those of unknown serostatus. [16] Today program planners have recognized that continued reliance on general HIV prevention messages may limit the effectiveness and sophistication of preventive messages. [17] Thus it may be more efficient to change behaivor among fewer HIV positive individuals than the many HIV negative ones. [18] HIV preventive strategies that target HIV positive individuals are known as positive prevention strategies. [19]

The Information Motivation Behavior (IBM) model provides a general approach in the design, implementation and evaluation of HIV risk reduction intervention programs which are targeted at the needs of specific populations that are at risk. Thus there are three phases involved in the application of this model; the first is the design; that is the development of the model, the second is the deployment; which is the implementation of the model and lastly the third; which is the evaluation of the effectiveness of the model on reducing HIV related risk behaviors. Previous research has shown this model to be effective in producing significant changes in HIV risk reduction information, motivation and behavioral skills, and also sustained improvements in HIV related preventive behavior such as condom use. [20]

With condom use and HIV status disclosure still being very important determinants in the prevention of HIV spread between adult patients living with HIV and HIV negative individuals or individuals of unknown status in Nigeria, the objective of this research was to develop and implement a clinician client centered counseling manual and evaluate its effectiveness in improving condom use and HIV status disclosure among adults patients living with HIV enrolled in care in Yola, Nigeria.

MATERIALS AND METHODS

Parts of the methodology of this research have been previously published along with baseline results of this research. [21,22]

Study Design: This study was a three arm randomized single blind clinical trial involving 386 randomly selected and allocated adult patients living with HIV who were enrolled into antiretroviral therapy (ART) care at any four comprehensive ART sites in Yola. These comprehensive sites were the; Federal Medical Center (FMC) Yola, State Specialist Hospital Yola (SSHY), St Francis Hospital Jambutu and Adamawa Hospital. The trial took place from January to September 2014. A Clinician Client Centered training module was developed based on the Information Behavior and Motivation (IBM) Model. Nine clinicians involved in ART care were trained with this module to deliver a 10 to 15 minutes clinic based intervention (Clinician Client Centered (CCC) counseling). Intervention group one received two counseling sessions; at baseline then at two months. Intervention group two received a counseling session at baseline only and the control group received routine care.

Participant selection criteria and recruitment

Criteria for inclusion into this study included all persons diagnosed with HIV ≥ 18years of age presenting to any four comprehensive ART clinics in Yola. Patients excluded from this study were those patients who were HIV positive but diagnosed with psychiatric disorders.

Sample size determination

The formula by Lemeshow et al was used for sample size estimation, [23] Estimations were done for all outcome variables of this research. These variables were; HIV knowledge, attitudes towards HIV/AIDS, condom use, multiple sexual partners and HIV status disclosure.

The largest sample size was obtained for the outcome variable of attitude towards HIV/AIDS. Prevalence of positive attitudes

towards HIV/AIDS of PLWHAs in Nigeria is 79.3%. [24] A prevalence of 90% positive attitude towards HIV/AIDS was desired. An initial sample size of 117 was obtained per group making a total of 351 for the 3 groups. Taking into account 10% for attrition the final sample size was 386. Probability proportionate to the size of adult patients living with HIV enrolled in care at each comprehensive ART site was used to allocate the number of participants recruited at each site.

Definition of terms

In this study an adult patient living with HIV was a person ≥ 18 years of age reactive to HIV antibody in his or her serum. Sexual intercourse/sexual encounter referred to penetrative/receptive vaginal, oral or anal sex. Sexual partners in and out of marriage were considered. Sexual relationship referred to relationships involving sexual intimacy. [25]

The sample frame was the list of patients for ART clinic at each recruitment site. Using this list a systematic random sampling technique was used with a regular interval after an initial random selection of the first client. The initial random selection of the first client was by balloting; a member of the research team was asked to choose a lucky number between numbers one and the site's sampling interval. The patient whose serial number corresponded with the chosen number was the first to be selected at the site. This process was done at all study sites. At the recruitment sites, total of 526 HIV positive patients were assessed for their eligibility out of which 140 were excluded. Reasons for exclusion included 56 patients who did not meet inclusion criteria (50 children and 6 with psychiatric disorders) and 60 patients who declined consent. Twenty four others excluded for other reasons included 20 patients who intended to transfer out to other ART clinics outside Yola (study area) and four pregnant women who expected to give birth during the period of the research and believed that their deliveries may affect compliance with the study protocol (Figure 1).

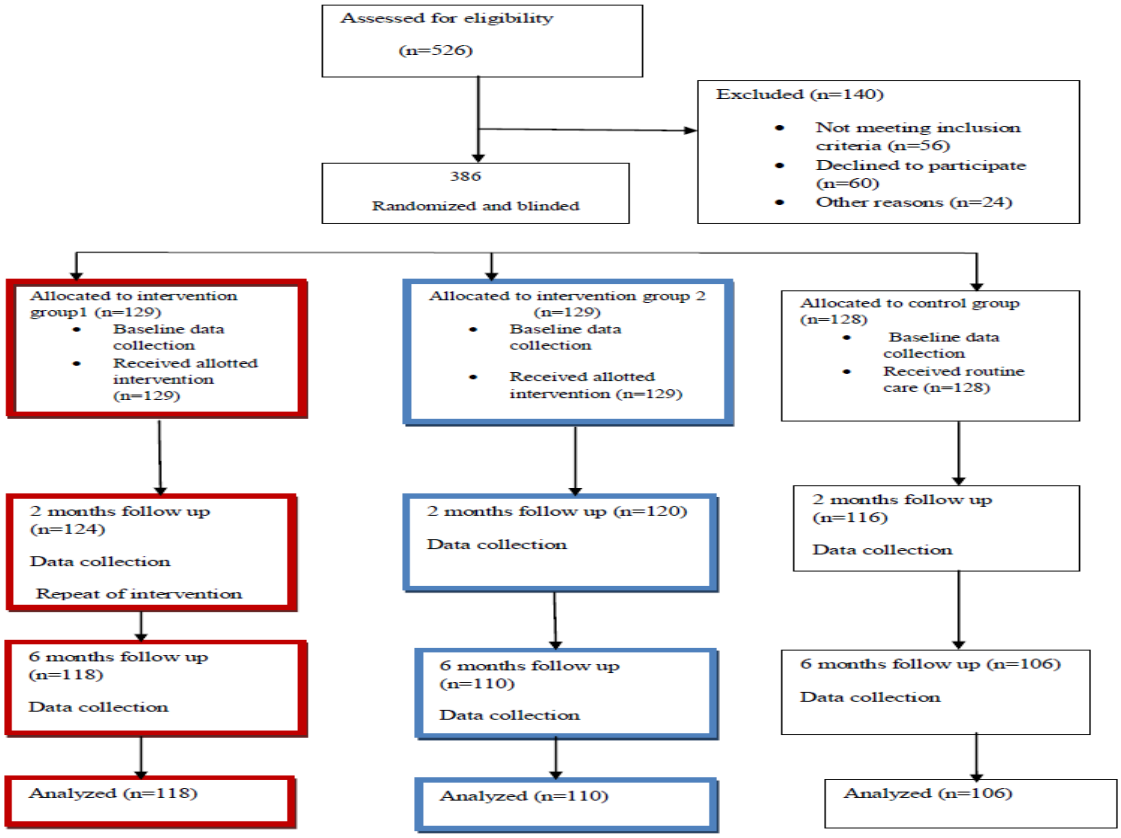

Figure 1: Flow diagram of patient participants in a randomized clinical trial conducted among HIV positive patient in all 4 comprehensive ART sites in Yola Nigeria

Eligible patients who gave their consent were randomized and blinded. Opaque envelopes containing allocation color coded cards (white for 'controls' and pink for 'intervention group one' and blue for 'intervention group two' were used to execute the random assignment to the three groups so as to minimize allocation bias. A total of 386 color coded cards put in separate sealed opaque envelopes (129 pink cards, 129 blue cards and 128 white cards) where placed in a box and shuffled together. Under strict supervision a client was allowed to pick a single envelope and then proceed to a consulting room as directed by a research assistant without opening the envelop. After every pick the remaining envelops were again reshuffled before the next supervised pick. At the exhaustion of all envelopes; Intervention group one, intervention group two and the control group had a total of 129, 129 and 128 patients respectively. On receipt of the sealed envelope the trained clinician opened it and used the color code to know which group the client belonged and so determined who was to and who was not to receive the intervention. A single blinded technique was employed with clients not knowing which group they belonged to.

The color coded cards were stuck on the front inner cover of all hospital folders of patients in the study. An initial code was given to every patient; this was unique and included the comprehensive site of recruitment into the study. This code was maintained throughout the study and used to know clients who remained in the study or left the study. The presence of the cards on folders indicated the group of the client and so indicated the number of interventions (CCC counseling) to give or if no intervention was required.

To guide against interviewer and respondent bias, clinicians and clients in this study had a single contact (the clinician who had the initial client based counseling session with a patient was not involved in administering questionnaires, or repeating a counseling session to this client at follow up visit). After each encounter (counseling session or interview), every clinician signed on the color coded cards. This further ensured a single contact between a clinician and client as the presence of a clinicians' signature on the coded card indicated he or she could no longer have any contact with that patient during the study period and thus the patient was seen by another clinician.

Development of the CCC Counseling Module

A counseling training module was developed and used to train the clinicians who delivered the clinic based intervention. This module was developed through the process of consultations with a group of experts. These included two experts in health education and promotion, an expert in behavioral intervention, two experts in infectious diseases and two consultants in public health. It was based on the IBM model [26] and had 5 sections. Session one started the module with an overview of client centered counseling. Session two was on HIV knowledge on transmission and prevention. Session three was on the prevention of HIV sexual transmission with focus on multiple partners and condom use. Session four was on status disclosure and Session five on risk reduction counseling. Hand cards with diagrams for visual aided explanations were made available with the manual as counseling tools for use by clinicians during counseling sessions. A guide line check list of all areas of the counseling was also constructed along with the training manual and was to be with each clinician at time of the intervention. The module had a questionnaire which served as a pre and post test to trainees.

Clinician Training

The clinicians involved in this process were selected based on volunteerism. The first nine clinicians who volunteered and also meet the selection criteria were trained on CCC Counseling. These clinicians were from the four ART comprehensive sites in the study area. All trained clinicians were involved in

delivering the intervention at all the ART sites.

Selection criteria included; that they must have at least a year work experience in the ART unit of their various hospitals and had previous training in counseling. This was to ensure adequate experience and knowledge in HIV treatment and care. Two days training was done for clinicians using the developed CCC counseling training manual. The training covered all five sessions of the manual. This was followed by explanations of the visual hand cards and the CCC counseling check list. The data collection tool to be used in the study was thoroughly explained to all trained clinicians to ensure quality control during data collection. Methods used in the training included; brain storming, power point lectures with slides, role plays with constructive criticism along with question and answer sessions. Pre and post tests sessions took place accordingly.

On completion of the clinicians' training, practice sessions on how to deliver the intervention were conducted; this was done alongside with pre testing of the questionnaire used for data collection. Areas of emphasis included; the content of the counseling session, timing of sessions and technique and use of an individualized client centered approach.

Intervention

The intervention was a 10 to 15 minute clinic based one on one counseling session between a clinician (counselor) and an adult patient living with HIV (client). Counseling sessions were interactive and allowed for listening, questions and answers. They were cultural sensitive and also consider issues related to gender and age. Areas covered during the brief counseling included; HIV transmission and prevention, healthy sexual practices, condom use, reduction in multiple sexual partners, beneficial disclosure, and individual risk assessment and reduction strategies. Clinicians evaluated patients' readiness to change risky or maintain safer behaviors; they also assisted the patient to negotiate an individually tailored behavior change or maintenance plan of action.

Data collection

A validated and pretested questionnaire was employed as the data collection tool. Questionnaires were interviewer administered. Data was collected at three different time frames; at baseline, two months and at six months. The questionnaire was modified version of those used by used by Carey, Morrison and Johnson (HIV knowledge and prevention) in 1997, [27] Misovich, Fisher and Fisher (A measure of AIDS prevention information, motivation, behavioral skills and behavior) in 1998 [28] and the AIDSCAPS/WHO/CAPS Counseling & Testing Efficacy study: C & T Baseline instrument (1995). [29] It consisted of five sections; Section one on socio-demographic variables, Section two consisted of questions on the knowledge of HIV transmission and prevention and had a total of 17 statements and answers that had the options of 'yes', 'no' and 'don't know'. Section three consisted of five statements to address patient's attitude towards HIV/AIDS. Answer options to these questions were on a five point likert scale ranging from strongly agrees, agree, don't know, disagree and strongly disagree. Section four addressed sexual behavior patterns; recent sexual activity in the last 30 days preceding the survey, type of sexual relationship (monogamous or polygamous), condom use, gender of sexual partner and type of sexual practice (oral, anal and vaginal). Section five; addressed issues of status disclosure. Questions were directed at number of spouse/sexual partner who were aware of the respondents' HIV status. The questionnaire was reviewed by a panel of experts which included two experts in health education and promotion, an expert in behavioral intervention, two experts in infectious diseases and two consultants in public health. These experts gave a consensus that existing items in the questionnaire were valid and measured knowledge on HIV transmission and

prevention, attitudes of ART patients to HIV/AIDS, sexual behavior and status disclosure.

Reliability test for knowledge gave a Cronbach's alpha of 0.81and that of attitude gave a Cronbach's alpha of 0.76.

Measurements

Measurements were operational as follows: Independent variables which included age at last birthday later categorized in 10-year age brackets; gender, occupation, marital status and level of education that were nominally categorized.

The dependent variables were condom use scores and HIV status disclosure scores. The condom use score was the proportion obtained by determining the number of times a condom was used during sexual intercourse divided by the total number of times a respondent had sexual intercourse in the preceding 30 days. A score of one was given for each spouse/sexual partner a respondent had disclosed his or her HIV status to in the preceding 30 days. A patient with one sexual partner who discloses to this single partner gets a disclosure score of one. A patient with several sex partners for example 10, gets a proportionate score based on the number of sex partners-if he discloses to the 10 partners he gets one disclosure score, if he discloses to five partners out of the ten he get a disclosure score of 5/10=0.5

Ethical clearance

Ethical approval was obtained from the Faculty Human Research Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia before conducting the study. Ethical clearance was also obtained from the Health Research Ethics Committee of Federal Medical Center Yola Nigeria. A written and signed informed consent was obtained from each participant. This written consent was made available in English, Hausa and Fulani (Hausa and Fulani being the two major native languages in Yola)

Statistical analysis

Data was analyzed using SPSS version 22. Status disclosure scores and condom use scores obtained were not normally distributed. A log10 data transformation was performed on status disclosure scores. Data transformation performed on condom use scores with both log10 and square root was unsuccessful. Kruskal Wallis ANOVA was used to compare median condom use scores among the 3 study groups at baseline, two months and six month. Friedman's repeated measure ANOVA was used to determine the main effects of group, time and group and time interaction effects on the median condom use scores. One way ANOVA was used to compare HIV status disclosure scores among groups at baseline, two months and six months. Mixed design ANOVA was employed to look at the main effects of age (<45 years or ≥45 years), gender, group, time and group – time interaction effects on HIV status disclosure scores. Test of significance was at α level 0.05. A partial eta square ($\dot{\eta}^2$) as a measure of effect size representing the variance in proportions of the dependent variable that can be explained by the independent variable was applied to both mixed design ANOVA and Friedman's repeated measures ANOVA. The interpretation of the strength of eta squared values followed guidelines by Cohen [30] small effect (0.01), moderate effect (0.06) and large effect (0.14).

RESULTS

Response rate

A total of 386 HIV positive patients were recruited from the four comprehensive ART sites. At two months 360 patients were left in the study giving a response rate of 93.3%. At six months a total of 334 patients were left giving a response rate of 86.5%. Of the 52 patients lost to follow up 27 (51.9%) transferred out to ART clinics outside Yola, 12 (23.1%) died and 13 (25%) defaulted their routine clinic attendance during the period of the study.

Baseline socio-demographic variables

Out of the 386 patient, 106 (27.5%) were male. Most respondents 150 (38.9%) were between the ages of 30 to 39 years though the youngest respondent was 18 years and the oldest 70 years. The largest indigenous tribe was the Bwatiye tribe consisting in total 70 (20.5%) of respondents

Two hundred and ninety six (76.9%) were from Adamawa state. Majority were married 207 (53.6%) One hundred and thirty three (34.5%) had attained tertiary education while 54(14.5%) had no form of education or were informally educated. Majority of respondents were civil servants (government employed); 102 (26.4%).

Most respondents 207 (53.9%) had known about their HIV status for less than three years with 377 (97.7%) already on HAART. No significant difference was seen in the socio-demographic characteristics among the three study groups (Table 1).

Table1: Socio-demographic characteristics by groups

Variables	Frequency, n (%)			Total	Test type	p-value
	Intervention 1	Intervention 2	Control group			
Age group (years)						
<30	29 (22.5)	26 (20.2)	33 (25.8)	88 (22.8)	χ^2	0.32
30-39	47 (36.4)	62 (48.1)	41 (32.0)	150 (38.9)		
40-49	40 (31.0)	25 (19.4)	39 (30.5)	104 (26.9)		
≥50	13 (10.1)	14 (10.9)	17 (13.4)	44 (11.4)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		
Mean, SD	37.47 (9.45)	37.12 (9.76)	37.07 (10.02)	37.22(9.72)	*F*	0.94
95% CI	(35.82-39.12)	(35.42-38.82)	(35.32-38.82)	(36.24-38.19)		
Gender						
Male	38(29.5)	32(24.8)	36(28.1)	106(27.5)	χ^2	0.70
Female	91(70.5)	97(75.2)	92(71.9)	280(72.5)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		
Marital status						
Single	25(19.4)	19(14.7)	30(23.4)	74(19.2)	χ^2	0.18
Married	66(51.2)	75(58.1)	66(51.6)	207(53.6)		
Divorced/ Separated	15(10.9)	16(12.4)	9(7.1)	39(10.1)		
Widowed	24(18.6)	19(14.7)	23(18.0)	66(17.1)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		
Occupation						
None	20(15.6)	35(27.2)	39(30.5)	94(24.4)		
Student	6(4.7)	9(7.0)	7(5.5)	22(5.7)		
Civil servant	39(30.2)	29(22.5)	34(26.6)	102(26.4)	χ^2	0.32
Business	34(26.4)	30(23.3)	27(21.1)	91(23.6)		
Farming	9(7.0)	9(7.0)	8(6.3)	26(6.7)		
Others	21(16.3)	17(13.2)	13(10.2)	51(13.2)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		
Level of education						
None/informal	11(8.6)	20(17.1)	23(18.0)	54(14.5)		
Primary	36(28.0)	17(13.2)	24(18.8)	77(19.9)		
Secondary	38(29.5)	45(34.9)	37(29.0)	120(31.1)	χ^2	0.26
Tertiary	44(34.1)	45(34.9)	44(34.4)	133(34.5)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		

Chi square test (χ^2) One way ANOVA (F) test, Significant at $p < 0.05$

Baseline sexual practices, condom use and status disclosure rates

At baseline 178 (46.1%) respondents admitted to sexual activities within the last 30 days. Twenty nine (48.3%), 21 (32.8%) and 17 (31.5%) from intervention group one, intervention group two and the control group respectively had used condoms consistently in each sexual act in the last 30 days. Among the inconsistent condom users; a total of 58 (15.0%) admitted to never using condoms during sexual intercourse. There was no significant difference in condom use among the 3 study groups (p=0.07) (Table 2).

No statistical difference was seen among the three groups in respect to type of union (monogamous or polygamous), gender of sex partners and type of sexual practice (oral, anal and vaginal).

Out of the 386 respondents, 292 (75.6%) were in sexual relationships. Two hundred and fifty nine (88.7%) of these respondents had disclosed their HIV status to their spouses and sex partners. No significant difference was seen in proportion of respondents who had disclosed their HIV status to their spouses and/or sex partners were seen among the three groups (p=0.59) (Table 2)

Table 2: Baseline comparison of respondents in sexual relationships, sexual activity, condom use and status disclosure by groups

Variables	Frequency, n=386 (%)			Total	Test	p-value
	Intervention 1	Intervention 2	Control group			
Yes	102(79.1)	95(73.6)	95(74.2)	292(75.6)	χ^2	0.54
No	27(20.9)	34(26.4)	33(25.8)	94(24.4)		
Total	129(100.0)	129(100.0)	128(100.0)	386(100.0)		
Have you had sexual intercourse at all during the last 30 days?(n-386)						
Yes	60(46.5)	64(49.6)	54(42.2)	178(46.1)	χ^2	0.49
No	69(53.5)	65(50.4)	74(57.8)	208(53.9)		
Total	129(100.0)	129(100.0)	128(100.00	386(100.0)		
Condom use in sexual activities in the last 30days (n=178)						
Consistent user	29(48.3)	21(32.8)	17(31.5)	67(37.6)	χ^2	0.11
Inconsistent user	31(51.7)	43(67.2)	37(68.5)	111(62.4)		
Total	60(100.0)	64(100.0)	58(100.0)	178(100.0)		
Disclosed HIV status to spouses(s)/partner(s) (n=292)						
No	13(12.7)	12(12.6)	8(8.4)	33(11.3)		
Yes	89(87.3)	83(87.4)	87(91.6)	259(88.7)	χ^2	0.56
Total	102(100.0)	95(100.0)	95(100.0)	292(100.0)		

Chi square test (χ^2) *significant at $p < 0.05$

Table 3: Group main effect on condom use at baseline, 2 months and 6 months

Outcome measure Condom use score	GROUPS, n Median (mean ranks)			df	Kruskall Wallis ANOVA χ^2	p value
	Intervention group 1 (n=129)	Intervention Group 2 (n=129)	Control group (n = 128)			
Baseline	1.00(100.06)	0.40(83.30)	0.00(74.53)	2, 175	8.82	0.01*
2 months follow up	1.00(96.09)	0.50(71.39)	0.50(66.61)	2, 157	14.60	0.01*
6 months follow up	1.00(110.93)	0.50(70.87)	0.00(59.22)	2, 168	48.66	0.01*

Kruskall Wallis ANOVA used to calculate p value, df; degree of freedom, *significant at <0.05

Analysis of effectiveness of CCC Counseling on condom use

There was a significant difference in the median condom use score among the three study groups at baseline (p = 0.01) (Table3). This difference was between intervention group one and the control group (p = 0.01).

At two months a significant difference was seen among the median condom use scores of the three groups (p = 0.01). Likewise at six months a significant difference was seen among the median condom use scores of the three study groups (p = 0.01).

Post hoc analysis performed at two months showed a significantly higher median condom use score of intervention group one compared to the control group (1.00 vs 0.50; p = 0.01). There was a significantly higher median condom use score of intervention group one compared to intervention group two (1.00 vs 0.50, p = 0.01). No significant difference was seen between median condom use scores of intervention group two and the control group (0.50 vs 0.50; p = 0.54).

At six months a significantly higher median condom use score was seen in intervention group one compared to the control group (1.00 vs 0.00; p = 0.01). A significantly higher median condom use score in intervention group one compared to intervention group two (1.00 vs 0.50; p = 0.01) was also seen. No significant difference was seen between median condom use scores of intervention group two and the control group (0.50 vs 0.50; p = 0.15) (Table 4).

There was a significant change in median condom use scores from baseline to six months for intervention group one (p = 0.02) with mean ranks of 1.75, 1.99 and 2.26 at baseline, two months and six months respectively. No significant change in median condom use scores was seen from

baseline to six months for intervention group two (p= 0.81) and the control group (p = 0.80) (Table 5).

Group - time comparison for the different time pairs (Pair 1; baseline and 2 months, Pair 2; baseline and 6 months and Pair 3; 2 months and 6 months) were determined. A significant difference was seen in Pair 2 for intervention group one (p = 0.01). The different time pairs for intervention group two and the control groups were not significant.

Table 4: multiple pair wise comparison of group main effect of the median condom use score at baseline, 2 months and 6 months

Outcome measure	Groups at baseline, n Median (mean ranks)		Kruskall Wallis ANOVA χ^2	p value
Condom use score	Intervention group1(n=60) 0.50(62.56)	Control group (n=54) 0.50(46.08)	8.52	0.01*
	Intervention group1(n=60) 0.50(67.50)	Intervention group 2(n=64) 0.50 (5.88)	3.87	0.05
	Intervention group 2 (n=64) 0.00 (59.42)	Control group (n=54) 0.00 53.95)	0.94	0.33
	Groups at 2 months follow up, n Median (mean ranks)			
	Intervention group 1(n=55) 1.00(59.74)	Control group (n=50) 0.50(40.96)	12.009	0.01*
	Intervention group1(n=55) 1.00(63.85)	Intervention group 2(n=55) 0.50(46.31)	9.837	0.01*
	Intervention group 2 (n=55) 0.50 (53.08)	Control group (n=50) 0.50(49.65)	0.383	0.54
	Groups at 6 months follow up, n Median (mean ranks)			
	Intervention group 1(n=66) 1.00(71.40)	Control group (n=50) 0.00(36.78)	44.500	0.01*
	Intervention group1(n=66) 1.00(73.03)	Intervention group 2(n=55) 0.50(43.77)	32.459	0.01*
	Intervention group 2 (n=55) 0.50(54.09)	Control group (n=50) 0.00(46.45)	2.092	0.15

Kruskall Wallis ANOVA used to calculate p value, *significant at<0.05

Table 5: Summary table of Friedman's repeated measures ANOVA for median condom use scores

Group	Baseline median condom use score(mean rank)	2 months median condom use score(mean rank)	6 months median condom use score(mean rank)	Friedman's test χ^2	p value
Intervention group 1(n=129)	1.00(1.75)	1.00(1.99)	1.00(2.26)	12.410	0.01*
Intervention group 2(n=129)	0.50(1.94)	0.50(2.01)	0.50(2.05)	0.411	0.81
Control group(n=128)	0.10(1.98)	0.58(2.07)	0.00(1.95)	0.448	0.80

Friedman's repeated ANOVA used to calculate p value, *significant at<0.017; Bonferroni adjusted p value

Table 6: Group main effect on means of log HIV status disclosure scores at baseline, 2 months and 6 months

Outcome measure HIV Status disclosure	GROUPS, n Mean, SD (95%CI)			Df	One way ANOVA F	p value
Baseline	Intervention group 1 n =102	Intervention Group 2 n = 95	Control group n = 95			
	0.27, 0.11 (0.24 – 0.29)	0.29, 0.14 (0.26 – 0.32)	0.28, 0.10 (0.26 – 0.30)	2,289	1.14	0.32
2 months follow up	Intervention group 1 n =86	Intervention Group 2 n = 88	Control group n = 77			
6 months follow up	0.26, 0.10 0.24 – 0.28 Intervention group 1 n = 87	0.29, 0.06 (0.27 – 0.30) Intervention group 2 n = 82	0.22, 0.13 (0.20 – 0.25) Control group n = 69	2,248	6.89	0.01*
	0.30, 0.02 0.30 – 0.31	0.30, 0.02 0.29 – 0.30	0.25, 0.11 0.23 – 0.28	2,235	15.07	0.01*

ANOVA; Analysis of variance, df; degree of freedom, SD; Standard Deviation, 95%CI; 95% Confidence interval, *significant at <0.05

Analysis of effectiveness of CCC Counseling on HIV status disclosure

No significant difference was seen among the means of HIV status disclosure scores at baseline for the three groups (p = 0.32). At two months there was a significant difference among the means of the HIV status disclosure scores of the three groups (p = 0.01), similar findings were seen at six months (p = 0.01) (Table 6).

At two months a significantly higher mean HIV status disclosure score was seen in intervention group two compared to the control group (0.29 vs 0.22; p = 0.01). At six months a significantly higher mean HIV status disclosure was seen in intervention group one compared to the control group (0.30 vs 0.25; p = 0.01) and in intervention group two compared to the control group (0.30 vs 0.25; p = 0.01). No significant difference was seen between the mean HIV disclosure scores of intervention group one and intervention group two. (0.30 vs 0.30; p = 1.00) (Table7).

Table 7: Multiple pair wise comparison of group main effect on means of log of HIV status disclosure scores at 2 months and 6 months

Outcome measure	Groups , n		Mean difference	95%CI for mean difference	p value
HIV Status disclosure at 2 months follow up	Intervention group 1(n=86)	Control group (n=77)	0.04	-0.00 - 0.08	0.07
	Intervention group 1(n=86)	Intervention group 2 (n=88)	-0.02	-0.06 – 0.01	0.43
	Intervention group2(n=88)	Control group (n=77)	0.06	0.02 – 0.10	0.01*
HIV Status disclosure at 6 months follow up	Intervention group 1(n=87)	Control group (n=69)	0.05	0.03 – 0.08	0.01*
	Intervention group 1(n=87)	Intervention group 2 n=82)	0.00	-0.02 – 0.03	1.00
	Intervention group2(n=82)	Control group (n=69)	0.05	0.02 - 0.07	0.01*

95%CI; 95% Confidence Interval, *significant at <0.017; Bonferroni adjusted p value

There were no significant main effects for group (p = 0.68). There was a significant main effect for time (p = 0.02; partial $\dot{\eta}^2 = 0.03$). No significant main effect was seen for group and time interaction (p = 0.71). No significant interaction was seen among group, time and age (p =0.88) or group, time and gender (p = 0.95) for HIV status disclosure.

Looking at time pairs (Pair 1; baseline vs 2 months, Pair 2; baseline vs 6 months and Pair 3; 2 months vs 6 months) for the three study groups. The mean differences showed an increase in the mean HIV status disclosure score in intervention group1 for all time pairs, with statistical significance for Pair 1 (p = 0.01) and Pair 2 (p = 0.04). In intervention group two; an increase in the mean HIV status disclosure score was seen for all time pairs, with a significant mean difference seen for Pair 2 (p = 0.03). In the control group no significant mean difference was seen for any time pair.

DISCUSSION

Baseline condom use and disclosure rates

Inconsistent condom use among PLWHAs is not a unique finding to this study. Similar findings were seen in a study conducted to determine risk factors for HIV transmission among PLWHAs in Kano northern Nigeria where 67.8% and 8.3% reported that they occasionally and never use condoms during coitus respectively. [31] A low prevalence of 14.0% condom use was reported among PLWHAs prior to their commencing ARVs which increased to 43.3% after their commencement of ARVs. [4] Also reported is a condom use prevalence of 40.4% among PLWHAs in Southeast Nigeria [32] and a 51.5% condom use in last sexual encounter in the north central area of Nigeria. [33]

A high disclosure rate seen in this study could be explained by the fact that a large proportion of the respondents were married with most of them having met their current spouses during their routine clinic visits and thus were already aware of each other HIV status. Lower disclosure rates than that seen in this study has been reported in other studies conducted within the country; 18.6%, 50.9% and 61.5%. [14, 15,34]

Effectiveness of CCC counseling on condom use

In consideration of the fact that a significant difference existed at baseline between the median condom use scores of intervention group one and the control group, conclusions on the effectiveness of the intervention on condom use needs a close look at the changes in mean rank condom use scores within the study groups. Significant increase in the mean rank condom use scores in intervention group one from baseline to six months indicates an

increase in condom use among the respondents who had received CCC counseling twice. In intervention group two, insignificant increases in mean rank condom use scores from baseline to six months indicates no change in the condom use of respondents who had received CCC counseling once. In the control group lower mean rank condom use scores at six months compared to baseline indicates that there was a reduction in condom use of respondents who did not receive CCC counseling (Table 4). With these findings the CCC Counseling can be said to be effective at improving condom use when delivered twice within a time frame of 6 month.

Clinician delivered hospital based interventions have been shown to be effective at reducing unprotected sexual intercourse among PLWHAs in other studies that interventions were in the form of counseling. [10,11] Notably, the participants were followed up for >12 months in both studies. In this research follow up was for six months and 30 days recall was used at the time of interviews. Thus a longer follow up period may be needed to determine if improved changes in condom use would be sustained.

Reductions in unprotected vaginal and anal sex were also reported in a randomized control trial in which participants in the intervention arm received counseling from a "video doctor" via a laptop. [35] Though similar to this research with the intervention being in the form of counseling, differences include that this research used a face to face counseling. However similar reports on reduced unprotected sexual acts were seen.

In a randomized control clinical trial involving six large HIV clinics in California; two clinics implemented a gain frame counseling approach (emphasized the positive consequences of practicing safe sex); two other clinics used a loss frame counseling approach (emphasis on the negative consequences of unsafe sex practices) and the last two clinics served as controls. Interventions were provided by medical providers. Respondents with multiple sex partners at baseline who received the loss frame counseling reported a significant reduction in unprotected vaginal and anal sex intercourse (38%, p = <0.01) when compared to the control group. No change in behaviors was observed in those who received the gain frame intervention. [36] In this research, interventions were strictly provided by clinicians and a gain or loss frame counseling approach was not employed in any of the study groups; rather different dose levels of a clinician client centered counseling sessions were delivered to participants. However both studies reported reduced frequencies of unprotected coitus.

Effectiveness of CCC Counseling on HIV status disclosure

Significant higher mean HIV status disclosure scores of intervention group one and intervention group two compared to the control group one at six months showed that respondents in both intervention groups who had received the intervention had significantly improved HIV status disclosure scores compared to respondents in the control group. No significant difference between respondents in intervention group one and group two at six months limits any conclusion that receiving the intervention twice results in better HIV status disclosure.

The absence of significant mean differences between grouped pairs at the end of the six months indicates that overall there were no differences in the HIV status disclosure of respondents in the three study arms (between group effects) despite the increased mean HIV status disclosure of the respondents in both intervention groups (within group effects). This result could be explained by the fact that even at baseline only a few proportion of respondents in the study were yet to disclose their HIV status to their spouse and /sex partners and so overall differences between the groups would be very marginal. With few numbers statistical power is also limited. Increased

HIV status disclosure within the intervention groups is indicative of the effectiveness of the intervention.

The findings of this research are similar to that seen by Skogmar et al, which showed that access to counseling did not bring about any significant difference in disclosure among different groups of patients. The groups in Skogmar's study consisted of those who received only pre and post test counseling without any professional counseling or support group, those who received pre and post test counseling with professional counseling or a support group and those not attending any form of counseling. [16] In this research though patients in the intervention groups received professionally delivered client centered counseling, no significant difference was seen in status disclosure between these patients and those in the control group as was similar to the reports by Skogmar.

No effects of gender on HIV status disclosures indicates that among the adults living with HIV enrolled in care there was no likelihood of a male or female being more likely to disclose his or her status to a spouse and/or sex partner. This finding is similar the reports by Adeyemo and her group. [34]

No effect of age on HIV status disclosure was seen. This indicates that being above or below 45 years of age and living with HIV did not have any effect on one disclosing his or her HIV status.

Strengths of this study include; the random selection of the study sample as well as the random allocation to the different arms of the study that helped to overcome threats of selection bias. Blinding of respondents in this study helped to reduce response bias. Ensuring a single contact between a clinician and respondent throughout the length of the study further helped to reduce response and interviewer bias. The effects of different doses levels of the intervention was made possible with intervention group one having two doses, intervention group two having a single dose and the control group receiving routine care. Use of trained clinicians to deliver the intervention had the benefit of increasing and improving their involvement in the counseling process. The use of Mixed – design ANOVA allowed for a combination of fixed effects and a repeated measure in the analysis.

Study limitations include the fact that though patients were sampled from the four ART comprehensive sites in Yola, this may not be fully representative of all persons living with HIV/AIDS in Yola as due to stigma and discrimination a significant number of patients still access ART services elsewhere. With the questionnaire as the tool of data collection, a lot depended on the truthfulness of respondents. The use of interviewer administered questionnaires (due to the literacy level of some respondents) and lack of anonymousity may have further affected the responses of respondents. Being a single blind study the interviewers (clinicians) are prone to some interviewer bias. The use of a 30 day recall period for sexual behavior limited information to recent behaviors. A longer follow up period may be more suitable in determining behavior change.

CONCLUSION

As a positive preventive strategy; CCC Counseling is an effective behavioral intervention in improving condom use and HIV status disclosure to spouses and/sex partners of adult patients living with HIV.

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