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THE PSYCHOSOCIAL PREDICTORS OF HIV RISKY SEXUAL BEHAVIOUR AMONG MSM IN NAIROBI, KENYA.

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ABSTRACT

HIV pandemic in Kenya has affected Men who have sex with men (MSM) more than other groups. The risky sexual behavior among them can be categorised into individual, network, psychosocial and community level. MSM sexual behaviour has been shaped by their social, environmental and biological vulnerabilities. The purpose of this study was to investigate the predictors of HIV risky sexual behaviour among MSM in Nairobi. Multimodal Therapy (MMT) which is based on Bandura's social, cognitive learning theory and Becker's health belief model formed the study theoretical framework. This was a quasi-experimental; non-equivalent (pre-test; post-test control group design. Questionnaire data from 188 MSM randomly selected from Hoymas and Ishtar centers in Nairobi were used to quantify potential predictors of risky behaviour. Findings showed that HIV transmission risk predictors can be reduced with MMT intervention. The implication for these findings is a recommendation for MSM communities to be prioritised in MMT behavioural intervention research portfolios. This study also recommends adoption of MMT across MSM subgroups.

Keywords: Antiretroviral Therapy, Effectiveness, MSM, Multimodal, High risk group, High risk behaviour.

INTRODUCTION

UNAIDS defines risky behaviour as the probability that a person may acquire HIV, usually as a result of specific behaviour that enables HIV infection to occur UNAIDS (2007). Kenya's HIV epidemic affects most of its general population, but some populations have higher risks of exposure than others. Men who have sex with men (MSM) HIV prevalence rate are 18.2%, (NASCOP, 2016). Stigma and discrimination towards MSM and their sub-groups deter many from seeking HIV services they need). As a result, programming and policy to address the HIV epidemic among Kenyan MSM has lagged behind Sanders et al (2015). This study investigated the psychosocial determinants of HIV risk behavior among MSM. The key study purpose was to

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assess the efficacy of multimodal therapy (MMT) intervention to reduce sexual risk behavior in HIV prevention among MSM in Nairobi, Kenya.

LITERATURE REVIEW

Estimates of risk sexual behaviour prevalence among men who have sex with men (MSM) are key indicators of HIV transmission and can be used to estimate the prevalence rate. Their risky sexual behavior is multifactorial and can be categorised into individual, network, social and community level. The MSM sexual behavior has been shaped by their social, environmental and biological vulnerabilities. The indicators are useful in the intervention needs for future planning and implementation NASCOP (2012). This group has 18.2% HIV prevalence compared to 5.6% in the general population Baral S, Sifakis F, Cleghorn F, Beyrer C. (2012). MSM have also been found to have sexual links with heterosexual community thus serving as a bridge in HIV transmission Beyrer C, Wirtz AL, Walker D, Johns B, Sifakis F, Baral SD. (2011). This study investigated the predictors of HIV risky sexual behavior among MSM in attempt to reduce their risky sexual behavior in HIV prevention.

Rotheram-Borus& Johnson (2011) in Healthy living Project team did a study to examine the factors that explain the effect of cognitive behavioural intervention on HIV transmission prevention among men who have sex with men (MSM). Of the 1910 HIV positive MSM, 616 participants considered to be at risk were randomized to a 15 session individually delivered cognitive behavioural intervention. The findings revealed that there was an overall reduction in HIV transmission risk among MSM showing that cognitive behavioural intervention is efficacious in reducing transmission risks among MSM. This demonstrates that cognitive behavioural therapy is also efficacious in predicting risk behaviour change and will be a key resource for this study.

Baral et al. (2011) conducted a study in Cameroon on HIV and AIDS prevalence and factors associated with HIV infection among men who have sex with men. 272 and 239 MSM aged 18 years and above were recruited from Douala and Yaounde respectively, using respondent-driven sampling method. High HIV prevalence was observed and condom use was low and inconsistent. The predictors included inconsistent condoms and condom lubricants use, higher biological risks of HIV acquisition and transmission associated with unprotected anal intercourse (UAI), a high number of male partners, drug use and syphilis co-infection, more female sexual partners, bisexual concurrency and bisexual partnerships, MSM sexual network, STI prevalence, levels of peer education, knowledge of HIV status within the population and network tendencies and transactional sex, high community viral load, Perceived stigma, including fear of seeking healthcare and refraining from disclosing same-sex practices to a health professional, discrimination, denial of healthcare access based on sexuality.The researchers recommended

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multimodal based interventions for MSM that will address all the four levels and are sensitive to concerns about the dynamics around the pandemic including confidentiality and care in service delivery.

Multimodal interventions for MSM that are sensitive to concerns about confidentiality address the complex individual, social, community-level and policy challenges are needed to successfully engage the MSM (Beyrer, Baral and Griensven, 2012). This information was pivotal to this study as it informed the choice and the motivation to carry out the research. This present study investigated the predictors of risk sexual behavior. Multimodal Therapy skills intervention proved efficacious in HIV risky sexual behavior reduction shown by increased consistent condom use and reduction in multiple sexual partners among MSM in Nairobi, Kenya. Three assessments were administered to both experimental and control groups to establish the predictors of risky behavior in MSM. Data from pre-test and post-test was analysed using causal comparative and inferential statistics. The findings showed that multimodal therapy was effective in identifying predictors of risky sexual behaviour related to HIV transmission among MSM in Kenya.

THEORETICAL FRAMEWORK

The theoretical framework informing and guiding this study include *Bandura's Social cognitive Learning Theory* (1986), Beck and Rosenstock Health Belief Model (1991) and Lazarus Multimodal Therapy (1998- 2008). These posit that people learn from one another, via observation, imitation, and modeling. These *theories* encompass attention, memory, and motivation as in virtual contexts thus informing arousals and clouding reason Lararus (2008). When individuals are sexually aroused, MSM activate, retrieve, and integrate relevant skills, knowledge, beliefs, etc., pertaining to safer sex when real-life risky contexts. The theories indicate a consensus that behaviour is learned and enforced from the environment through observation and modelling and therefore can be unlearned or replace. Bandura's social cognitive learning theory conceptualise risk behaviour as developing through stages necessitated by psychosocial-environmental factors which are the objective of this study. Masters & Johnson (1989), in their sexual behaviour theories posit that MSM lifestyle result of learning and consequently, an individual's sexual orientation homosexual or heterosexual can be channelled through different learning experiences. These theoretical perspectives look at risk sexual behaviour as learned like other behaviours are learned and can be unlearned through behavior change techniques (Simons, Kalichman & Santrock, 2004).

BEHAVIOURAL THEORY

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The key proponents of behavioural theory are Pavlov; classical conditioning (1927), Skinner; operant conditioning (1938) and Bandura (1971-1991) who combined classical, operant, and his social learning theory to form social cognition learning theory which later became behaviourism therapy as it is known today (Plotnik, 2009). Bandura later added the self-efficacy theory (1997) which is the belief that one can master a situation and produce positive outcome on the basis of perceived ability.The behavioural and social learning theories emphasize that environmental experiences and situations influence behaviour patterns that form one's personality. This has fostered a scientific climate for understanding personality by highlighting and facilitating the observation of behaviour. It also suggests that people have the ability to control their behaviour and the environment as they deem necessary. The social cognition theory adds value to the theoretical framework in that it underscores both the environmental influences and the cognitions of human mind to explain personality and temperament.

Bandura's Social Learning Theory posits that people learn from one another, via observation, imitation, and modelling. The model of interaction between environment, the person and the behaviour involves the person's thoughts and actions is called reciprocal determinism model.The interaction between the person and the environment involves human beliefs and cognitive competencies that are developed and modified by social influences and structures within the environment. The third interaction, between the environment and behaviour involves a person's behaviour determining the aspects of their environment and in turn their behaviour modified by that environment, (Simons, Kalichman & Santrock, 2004). Bandura's theory also suggests that people have ability to control their environment. The behavioural social cognitive learning perspectives help to explain the nature and development of MSM risky sexual behaviour and also indicate that any learned behaviour can be unlearned as long as the individuals believe they are able to master the behaviour change or self-efficacy (Mcleod, 2007). The findings of the present study will determine if MMT skills training to MSM is an efficacious intervention in HIV and AIDS transmission risk behaviour reduction.

The MMT skills promote individual behaviour change by exploring clients' personality through structural profile and personal life history inventory. The basic assumption of behavioural theories is that people are capable of self-directing their behaviour change (Corey, 2009). This is also the key assumption in multimodal intervention. Therefore any success on MSM risky sexual behaviour change will depend on their belief in ability to change their individual determinants of risky behaviour and core learning experiences. Therapist assumes that the client has learned maladaptive behaviour and that with therapeutic guidance client can modify these behaviours using relevant behavioural techniques. This makes behaviour theory relevant in guiding this study in the effective administration of the MMT skills (Lazarus and Lazarus, 2008). Behaviour theory emphasizes strict reliance on principles of the scientific method, concepts and procedures

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to give validity. The theory also stresses "doing" as opposed to mere talking about the problem and gathering insights and therefore useful in behaviour change interventions. In order to help MSM achieve goals in risky sexual behaviour MMT modality skills will begin with assessment based client's life history inventory and structural profile which explore the behaviours, affects, sensations, imagery, cognitions, interpersonal relationship and experiences. This guides the client in deciding the behaviours to change and those to retain after the interaction among the determinants (Masters & Burish, 2007). The latter are shown in figure

Bandura's (1977) social cognitive leaning theory and Rosenstock's health belief model (1974) have much in common since both represent applications of value expectancy theories. In this study, they complement each other since their focus is on the outcome expectancies and /or perceptions of benefits of multimodal intervention on sexual risk behaviour reduction among MSM to prevention HIV and AIDS infection. Both provide potentially effective interventions all directed at behavioural modifications and an approach to perceived self-efficacy that provides an explanation to influences in health related behaviour change as in MSM. Bandura (1986) asserts that human being is not like mindless robots to be controlled mechanically by others in the environment. Rather they think, reason, imagine, plan, expect, dream, interpret, value, choose and compare. When others control, our values and beliefs allow us to resist their control. He believed, and his theories reflect this belief, that humans have the capacity to control themselves; resist self-directed agency to guide their own behaviour and this motivates and inspires the person to take responsibility for their behaviour.

Bandura's social cognitive theory (1989) places social interactions of behaviour in a conceptual framework of its causation, cognitive process and personal behavioural determinants referred to as reciprocal determinism. This gives the MSM capacity to change their risky sexual behaviour. All they need is motivation, inspiration skills and the three elements of social cognitive theory's mechanism. In MMT modality skills, the therapist guides the client in setting goals for the sessions that follow. The goals have to do with behaviour change based on the multimodal BASIC ID modalities. The therapist does not search for hidden causes of the problem but assumes that the client has learned maladaptive behaviour which can be modified through multimodal skills. The therapist instructs and affirms the client to see any improvement as a result of his/her increased skilfulness and not as therapist's role (Corey &Fawcett, 2009). Empirical data on MMT and behaviour change efficacy have been in force since 1970s when Bandura was developing the social cognitive theory and the reciprocal determinism (Simons, Kalichman, & Santrock, 2004). Studies done in the past have indicated that multimodal therapy interventions can change the way people behave. Bandura (1991) suggested that individuals may be excellent predictors of how well they will master a potentially difficult problem if they have prior learning experiences. Multimodal therapy intervention applies different techniques from

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different models as needs arise. The kind of technique chosen depends on the client's individual structural profile inventory based on MMT BASIC modality assessment results (Burish & Masters, 2007). Brauer and Agras (1980) did a study on effects of MMT techniques on hypertension, randomly assigned 29 patients who had elevated blood pressure. They were put into 3 groups and assigned treatments as follows: biomedical prescription only, progressive muscle relaxation and low salt diet only; and combination of the above two with cognitive restructuring. The treatments began with blood pressure being taken at the baseline and a post-examination after ten weeks treatment.

The results indicated that all groups showed decline in blood pressure following treatment. However, the group that had all the three treatments continued to improve steadily long after six months. The risky sexual behaviour development in MSM is in Africa is multifactorial and can be categorised into individual, network, social and community level. The MSM sexual behaviour is not a disorder passé but has been shaped by their social, environmental and biological vulnerabilities. The present study is about the risky sexual behaviour in relation to HIV and AIDS prevention among MSM and this information is relevant in shaping the message. Sexual behaviour change among MSM often involves the development of alternative behaviour patterns that may predispose them to HIV and AIDS infection. However, in some cases sexual behaviour alternatives may not be feasible forcing the MSM to turn to sources of sexual release which expose them to HIV and AIDS infection (Burish & Masters, 2007). Therefore understanding the behaviour change dynamics in MSM is vital for HIV and AIDS prevention measures. The behaviour change interventions used in multimodal therapy including aversion treatments, biofeedback, self-monitoring and contingency management are designed to promote health and prevent illness. These multimodal behavioural interventions seek to reduce the risk of HIV and AIDS transmission by addressing risky behaviours (IBBS, 2012). Multimodal intervention in this study will aim at reducing the number of unprotected anal intercourse, number of sexual partners, improve treatment seeking and adherence and increase the consistent and correct use of condom.

The global available data show that men who have sex with men bear a heavier burden of HIV and AIDS than other populations. Therefore addressing HIV and AIDS in MSM will require effective combination prevention and treatment approaches to deal with complex issue around HIV and AIDS among MSM. Beyrer, Sulivan & Trapence (2012) did a study that involved 1918 MSM to assess the potential of HIV and AIDS transmission among MSM who engage in high risk activities in 4 cities in USA. The following findings were reported: 59% of the MSM had unprotected anal sex with multiple male partners majority of who were HIV positive. 15.6% of MSM engaged in unprotected intercourse with partners who were HIV-negative or whose status was not known. The conclusion was that an estimated 79.7% new infections were likely to have

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taken place among those who engaged in sex with the participants. These findings call for intensive prevention available and affordable programs for both infected and not infected persons to stem the spread of the virus.

In Scotland and Holland a carefully controlled outcome study conducted to compare MMT with less integrative approaches in helping children with learning disabilities clearly supported multimodal therapy. The study involved 34 patients suffering from obsessive-compulsive disorders, 90% of who had received prior treatment without success, and 70% of who had suffered from their disorders for more than 4 years. Multimodal intervention was administered for ten weeks after which substantial recoveries of the disorder had reduced by 40% (Janssen and Shepherd, 2010). These findings confirm the relevance of this study that addresses behavioural problems from the source through participants' personality assessment.

METHODOLOGY

This study adopted a quasi-experimental (pre-test, post-test non-equivalent control group design) in assessing the efficacy of multimodal intervention skills in HIV and AIDS prevention among men who have sex with MSM in Nairobi Kenya. According to (Creswell, 2009; & Leedy, 2006) the non-equivalent control group is a control group that appears similar to the experimental group but differs significantly in terms of the variables related to the group and provides controls for all major classes of potential confounds except the ones due to interactions of selection, maturation, history, instrumentation and statistical regression differentials. The Non-equivalent control group also provides comparative data to the treatment group. A quasi-experimental design is an experimental study in which the experimental and the control groups are not fully randomized during assignment however where possible randomization should be attempted for purposes of validity, Babbie (2010), Campbell (2003). In this study selective sampling was done as way of methodological innovation since the study population was large enough to accommodate randomization. The experimental group A and control group B were selected randomly. The study applied quantitative methods to investigate the efficacy of MMT intervention in risky sexual behaviour predictors in MSM. These explored the MSM perception of their vulnerability, sexual impulse control, belief in HAART to prevent, social network affiliations and perceived efficacy of behaviour change.

Estimates of risk sexual behaviour prevalence among MSM are key indicators of HIV and AIDS transmission and can be used to estimate the prevalence rate. These indicators are useful in the intervention needs for future planning and implementation. Rotheram-Borus, Johnson (2011) and the Healthy living Project team did a study to examine the factors that explain the effect of cognitive behavioural intervention on HIV and AIDS transmission prevention among men who have sex with men (MSM). Of the 1910 HIV positive MSM, 616 participants considered to be at

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risk were randomized to a 15 session individually delivered cognitive behavioural intervention. Baral et al. (2011) conducted a study in Cameroon on HIV and AIDS prevalence and factors associated with HIV infection among men who have sex with men. 272 and 239 MSM aged 18 years and above were recruited from Douala and Yaounde respectively, using respondent-driven sampling method. High HIV prevalence was observed and condom use was low and inconsistent. The predictors included inconsistent condoms and condom lubricants use, higher biological risks of HIV acquisition and transmission associated with unprotected anal intercourse (UAI), a high number of male partners, drug use and syphilis co-infection, more female sexual partners, bisexual concurrency and bisexual partnerships, MSM sexual network, STI prevalence, levels of peer education, knowledge of HIV status within the population and network tendencies and transactional sex, high community viral load, Perceived stigma, including fear of seeking healthcare and refraining from disclosing same-sex practices to a health professional, discrimination, denial of healthcare access based on sexuality.

The researchers recommended multimodal based interventions for MSM that will address all the four levels and are sensitive to concerns about the dynamics around the pandemic including confidentiality and care in service delivery. Multimodal interventions for MSM that are sensitive to concerns about confidentiality address the complex individual, social, community-level and policy challenges are needed to successfully engage the MSM (Beyrer, Baral and Griensven, 2012). This information is relevant to this study as it informs the choice and the motivation. Relationship Between MSM Psychosocial, Social Characteristics and Risk Behaviour Reduction.

Globally men who have sex with men (MSM) remain in need of targeted HIV-prevention services particularly in sub-Saharan Africa where they continue to bear a high burden of HIV infection (Tapsoba, Peshu & Sanders, 2009). In sub-Saharan Africa, same-sex behaviours have been neglected in HIV research (KAIS, 2012). In 2012, a pilot community-based HIV-prevention programme was implemented that aimed at reaching MSM in Cape Town and the neighbourhood towns to disseminate HIV and AIDS prevention information and supplies; promote condom use and HIV services. 98 Men who have sex with men (MSM) consented to participate in community-based HIV and AIDS prevention activities. The social activities and group meetings were found to be viable strategies for disseminating HIV-prevention information, condoms and water-based lubricant to MSM in this setting.

Community-based approaches have been used to reach MSM and other marginalized populations with HIV-prevention services in many settings. These programmes utilize peer education and the facilitation of safe social spaces to provide HIV education, address stigma and behavioural risks while facilitating HIV testing, treatment and care. Similar strategies have been used in Kenyans at Malindi, Nanyuki and Rachuonyo with HIV and HIV-prevention information, counselling and

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testing. The present study will apply this strategy by conducting the multimodal intervention within the MSM run community setting for both treatment and control group. The social learning theory suggests that behaviour is learned through, observing and imitating others' in their social interactions and is then reinforced by the environment. Therefore MSM psychosocial interactions and social demographic characteristics play a significant role in development of MSM sexual risk behaviour and can play the same role in changing the behaviour. Taking the intervention to their community and using their leaders who have overcome stigma and discrimination to pursue their dreams will boost their self-esteem and motivate them to dream too. Research on modelling shows that learners (MSM) in this study acquire the behaviour of those they hold in high esteem. In this regard this researcher has conveniently selected both HOYMAS and Ishtar centres and their leadership to participate in the MMT skill to foster mentor –protégé relationship between the MSM community and their opinion leaders.

Sambisa, Brodish, Rinyiru and Mbai (2009; 2013) conducted a follow up venue-based HIV and AIDS prevention study which included Voluntary Counseling and Testing (VCT) in three areas of Kenya: Malindi, Nanyuki and Rachuonyo (2013). The aims of the study was to assess the acceptability of VCT for the general population, (MSM), and (IDUs) within the context of a venue-based approach; determine if there were differences between those agreeing and not agreeing to testing; and the study factors associated with being HIV positive. Approximately 98% of IDUs and 97% of MSM agreed to VCT, providing evidence that populations with little access to services and whose behaviors are stigmatized and often considered illegal in their countries can be reached with needed HIV prevention services. Acceptability of VCT in the general population ranged from 60% in Malindi to 48% in Nanyuki.

The study concluded that venue based interventions are more appropriate means of reaching the high risk and vulnerable individuals including the stigmatized populations. The above findings opened the doors to otherwise closed populations to research and services and it is from these findings that the present study has found the scope and the site. It is therefore important to note that psychological variables such as depression, fear, low self-esteem and hopelessness are significant for predicting MSM HIV and AIDS risk behavior change due to fear of stigma and discrimination. Coupled with social demographic variables such as education level, economic status, age and family background can interfere with MSM, treatment seeking, assertiveness and self- efficacy by impeding their ability to negotiate for safer sex protection. In order to empower this population effectively, all HIV and AIDS prevention stakeholders will need to address the issues that stand in the way of prevention including self-awareness, cognitive, emotional, security and safety.

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In Kenya few data about social demographic or sexual behavior of MSM is available to inform the targeted interventions. The first ever AIDS indicator survey (KAIS, 2014) does not have any information on MSM data as a vulnerable group. Through the multimodal intervention skills the present study expects to come up with some HIV and AIDS risk reduction approaches that will be available as emergency internalized self- help tool for MSM sexual impulse control and risk behavior reduction. On percieved barriers to MSM risky behavior change, the participants cited social affiliations, social networks availability of HAART as the greatest barriers p=0.022; (p<0.001) (Table 14).

Table 14: Univariate analysis for socio-demographic characteristics as predictors of HIV and AIDS risky sexual behavior among MSM in Nairobi, Kenya.

Variable	N (%)
Age in years	
<25 years	92/188 (48.7%)
25 – 35 years	85/188 (45.0%)
>35 years	12/188 (6.3%)
Religion	
Christian	166/188 (87.8%)
Muslim	17 (9.0%)
Others	6 (3.1%)
Education	
Primary	13/188 (6.9%)
Secondary	103/188 (54.5%)
Higher education/college	73 (38.6%)
Having ever been married to a woman.	51/188 (27.0%)
Currently married and living with a female sexual partner.	37 (19.6%)
Consistently using condoms.	75/188 (39.7%)

Regarding socio-demographic characteristics namely; age, religion, education, marital status and occupation as perceived predictors of HIV and AIDS risky sexual behavior87.8% are Christians and 54.5% have secondary school level of education. 27.0% have been married to a female and 19.6% currently live with a female partner and only 39.7% of these consistently used condom. Age in years and at the discovery of their orientation were not associated with either consistent condom use or multiple sexual partners' reduction. The statistics captured here reveal that Religion (Christians, 87.8%), those with secondary school education (54.7%). These were associated with increased consisted condom use and reduced multiple sexual partners. This reveals that the intervention has a big effect in reducing risky sexual behavior among MSM in Nairobi, Kenya.

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4.5.1 Univariate analysis of socio-demographic characteristics among the MSM on consistent condom use

The univariate analysis was used to uncover the distribution structure of the study variables and the results are presented in table 16.

Table 15: Univariate analysis of demographic characteristics amongst the MSM

	Range	Mean	Std Deviation	Variance
Year of birth	1966 – 1999	1990.96	5.612	31.493
Age in years	18 – 49	25.71	5.392	29.078
Age at discovery on orientation	2 – 30	15.77	4.099	16.804
Number of sexual partners in the last one month	0 -15	2.95	2.538	6.442

The Bivariate analysis of psychosocial demographic predictors of consistent condom use.

Table 16: Bivariable analysis for socio- demographic characteristics and consistent condom use among MSM

Variable	Use of condoms consistently		Pearsons-chi-square test	p-value
Age in years	No	Yes		
<25 years	56/92 (60.9%)	36/92 (39.1%)	0.572	0.751
25 – 35 years	52/85 (61.2%	33/85 (38.8%)		
>35 years	6/12 (50.0%)	6/12 (50.0%)		
Religion				
Christian	98/166 (59.0%)	68/166 (41.0%)	4.077	0.130
Muslim	10/17 (58.8%)	7/17 (41.2%)		
Others	6/6 (100.0%)	0/6 (0.0%)		
Education				
Primary	6/13 (46.2%)	7/13 (53.8%)	2.899	0.235
Secondary	59/103 (57.3%)	44/103 (42.7%)		
Higher education/college	49/73 (67.1%)	24/73 (32.9%)		
You have ever been married to a woman				
No	86/138 (62.3%)	52/138 (37.7%)	0.856	**0.05***
Yes	28/51 (54.9%)	23/51 (45.1%)		

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You are currently married/living with a female sexual partner				
No	95/152 (62.5%) 19/37 (51.4%)	57/152 (37.5%) 18/37 (48.6%)	1.545	**0.020***

4.5.2 Bivariate analysis of psychosocial characteristics and consistent condom use

Regarding having done the best to reduce chances of transmitting or getting infected with HIV and AIDS, data showed the intervention effective in increasing condom use thereby reducing the risk of unprotected sex with multiple sex partners. (P=0.004).

On high risky behavior change starting with the individual participant, (59.5%) agreed while (41.5%) disagreed. On avoiding sexual arousal trigger to reduce risky behavior, (59.5%) agreed while (40.5% disagree. This shows that the Intervention was efficacious and informed the participants' decision in taking responsibility for their sexual behavior on psychosocial characteristics. On the participants' perceived greatest barriers to HIV/AIDS risky behavior change, (57.1 %,) said their social affiliations another (63.6%) said HAART availability and peer group acceptance while yet another 76.5% said all of the above (P-0.004). This shows that psychosocial characteristics are predictors of success or failure of risky behavior change among. Table 17: Presents the bivariate analysis of data results.

Table 17: presents bivariate analysis of psychosocial characteristics and consistent condom use among MSM

Variable	Consistent condom use	No Consistent condom use	Chi-square test	p-value
Personal HIV risky behaviour change starts with you				
No	17/26 (65.4%)	9/26 (34.6%)	0.323	
Yes	97/163 (59.5%)	66/163 (40.5%)		
				0.050*
Removing sexual arousal trigger behaviours is helps lowers risk acts				
No	17/26 (65.4%)	9/26 (34.6%)		0.570
Yes	97/188 (51.5%)	66/188 (35.1%)		
				0.015*
Modifying sensuous settings (changing environment) prevent risk acts				

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No	34/57 (59.6%)	23/57 (40.4%)	0.323	0.902
Yes	80/132 (60.6%)	52/132 (39.4%)		
Narrowing relationships that expose one to HIV minimizes risk acts				
No	18/33 (54.5%)	15/33 (45.5%)	0.556	0457
Yes	96/156 (61.5%)	60/156 (38.5%)		
Getting an accountable partner for reinforcement reduces risk acts				**0.0450**
No	25/47 (53.2%)	22/47 (46.8%)	1.327	0323
Yes	89/142 (62.7%)	53/142 (37.3%)		
				0.0302
Exercise impulse control will prevent risk acts				
No	22/37 (59.5%)	15/37 (40.5%)	0.014	0.905
Yes	92/152 (60.5%)	60/152 (39.5%)		
				0.0143
Have often had alcoholic drinks during the last 4 weeks				
Very often	21/34 (61.8%)	13/34 (38.2%)	3.289	0.511
A good deal	26/41 (63.4%)	15/41 (36.6%)		
Not much	36/62 (58.1%)	26/62 (41.9%)		
Not at all	27/48 (56.2%)	21/48 (43.8%)		
Don't know	4/4 (100.0%)	0/4 (0.0%)		
Have tried various types of drugs.				
Alcohol & cigarettes	35/51 (68.6%)	16/51 (31.4%)	2.210	0.530
Alcohol only	44/77 (57.1%)	33/77 (42.9%)		
Not at all	26/44 (59.1%)	18/44 (40.9%)		
Others	9/17 (52.9%)	8/17 (47.1%)		
You have tried to modify your sexual behavior since knowing your status.				
No	32/46 (69.6%)	14/46 (30.4%)	2.172	0.413
Yes	82/143 (57.3%)	61/143 (42.7%)		
Have injected drugs in the last one month				
No	101/165 (61.2%)	64/165 (38.8%)	0.435	
Yes				**0.0141***

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	13/24 (54.2%)	11/24 (45.8%)		
The likelihood of transmitting or getting infected with HIV compared to other MSM				
Very likely	36/64 (56.2%)	28/64 (43.8%)	2.080	0.721
Somehow likely	29/49 (59.2%)	20/49 (40.8%)		
Likely	19/27 (70.4%)	8/27 (29.6%)		
Not likely	16/28 (57.1%)	12/28 (42.9%)		
Don't know	14/21 (66.7%)	7/21 (33.3%)		
Have you done my best to reduce chances of transmitting or getting infected with HIV				
No	15/16 (93.8%)	1/16 (6.2%)	**8.163**	**0.004***
Yes	99/173 (57.2%)	74/173 (42.8%)		
Rate your perceived greatest barriers to HIV risk behavior change				
Sexual impulse and/or MSM Social affiliation	56/88 (63.6%)	32/88 (36.4%	**9.656**	**0.022***
HAART availability &/ or peer group acceptance	18/42 (42.9%)	24/42 (57.1%)		
All of the above	26/34 (76.5%)	8/34 (23.5%)		
Don't know	14/25 (56.0%)	11/25 (44.0%)		
In the past one month you have had sexual contact with another man. Indicate.				
Oral sex & Others	15/27 (55.6%)	12/27 (44.4%)	5.727	0.220
Anal sex only	39/67 (58.2%)	28/67 (41.8%)		
Anal sex & Others	13/23 (56.5%)	10/23 (43.5%)		
You touched the penis… &/or another man touched your penis	14/28 (50.0%)	14/28 (50.0%)		
All of the above	33/44 (75.0%)	11/44 (25.0%)		
In the past one month you had oral sex with a man, where a man put his penis in your mouth and you put yours in his mouth.				
No	61/95 (64.2%)	34/95 (35.8%)	1.209	**0.027***
Yes	53/94 (56.4%)	41/94 (43.6%)		
You or your partner often used				

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condom during the last one month.				
Very often	43/91 (47.3%)	48/91 (52.7%)	**19.846**	**0.001**
A good deal	28/47 (59.6%)	19/47 (40.4%)		**0.027**
Not much	27/34 (79.4%)	7/34 (20.6%)		
Not at all	13/14 (92.9%)	1/14 (7.1%)		
Don't know	3/3 (100.0%)	0/3 (0.0%)		
You ejaculated in another man's mouth or you partner ejaculated in your mouth.				
No	85/143 (59.4%)	58/143 (40.6%)	0.189	0.664
Yes	29/46 (63.0%)	17/46 (37.0%)		
You had anal sex with a commercial partner in the last one month.				
No	57/88 (64.8%)	31/88 (35.2%)	1.366	0.243
Yes	57/101 (56.4%)	44/101 (43.6%)		
You have ever discussed HIV/AIDS/STDs with any of your commercial sex partners.				
No	47/61 (77.0%)	14/61 (23.0%)		
Yes	67/128 (52.3%)	61/128 (47.7%)	**10.535**	**0.001***
You had anal sex with other partners in the last one month				
No	28/45 (62.2%)	17/45 (7.8%)	0.090	0.765
Yes	86/144 (59.7%)	58/144 (40.3%)		
You have ever discussed HIV/AIDS/STDS with your non-paying partners				
No	28/37 (75.7%)	9/37 (24.3%)		
Yes	86/152 (56.6%)	66/152 (43.4%)		
You have ever had sexual intercourses with women.				
No	45/68 (66.2%)	23/68 (33.8%)		
Yes	69/121 (57.0%)			
			4.534	**0.003***
You have ever used a lubricant.				
No	8/11 (72.7%)	3/11 (27.3%)	0.751	0.386
Yes	106/178 (59.6%)	72/178 (40.4%)		
You have had diseases that can be transmitted through sexual				

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intercourse.				
No	28/43 (65.1%)	15/43 (34.9%)	0.536	0.464
Yes	86/146 (58.9%)	60/146 (41.1%)		
You have had a genital discharge in the last 2 months.				
No	98/153 (64.1%)	55/153 (35.9%)	**4.681**	**0.003***
Yes	16/36 (44.4%)	20/36 (55.6%)		
You have had an anal ulcer or sore during the last 2 months.				
No	94/155 (60.6%)	61/155 (39.4%)	0.039	0.844
Yes	20/34 (58.8%)	14/34 (41.2%)		
You have had anal discharge in the last 2 months.				
No	106/168 (63.1%)	62/168 (36.9%)	**4.874**	**0.027***
Yes	8/21 (38.1%)	1321 (61.9%)		
Most MSM I meet only engage in safer sex practices.				
No	50/73 (68.5%)	23/73 (31.5%)	3.321	0.068
Yes	64/116 (55.2%)	52/116 (44.8%)		
I have trouble letting a sex partner know that I want to have safer sex only				
No	79/119 (66.4%)	40/119 (33.6%)	**4.944**	**0.026***
Yes	35/70 (50.0%)	35/70 (50.0%)		
I can choose safer sex with a man I have sex with regularly				
No	13/20 (65.0%)	7/20 (35.0%)	0.205	0.651
Yes	101/169 (59.8%)	68/169 (40.2%)		
I am able to avoid behaviour that may put me at a risk of HIV infection				
No	12/15 (80.0%)	3/15 (20.0%)	2.637	0.104
Yes	102/174 (58.6%)	72/174 (41.4%)		
I find it hard to have sex with a man I have strong sexual feelings for				
No	68/115 (59.1%)	47/115 (40.9%)	0.173	0.678
Yes	46/74 (62.2%)	28/74 (37.8%)		
I find it difficult to have safer sex when high or drunk				
No	53/85 (62.4%)	32/85 (37.6%)	0.267	0.605
Yes	61/104 (58.7%)	43/104 (41.3%)		

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I am less concerned about having anal sex without a condom now that new anti HIV combination treatments are available				
No	83/137 (60.6%)	54/137 (39.4%)	0.015	0.903
Yes	31/52 (59.6%)	21/52 (40.4%)		
Someone can talk me out of safer sex by persuading me they are HIV negative				
No	84/139 (60.4%)	55/139 (39.6%)	0.003	0.957
Yes	30/50 (60.0%)	20/50 (40.0%)		
If ever I did something risky, I am confident that I would go back to having safer sex right away				
No	28/41 (68.3%)	13/41 (31.7%)	1.391	0.238
Yes	86/148 (58.1%)	62/148 (41.9%)		
I can avoid situations that I consider sexually risky				
No	12/14 (85.7%)	2/14 (14.3%)	**4.074**	**0.044***
Yes	102/175 (58.3%)	73/175 (41.7%)		
I am confident that I can have safer sex even if my partner does not want				
No	16/30 (53.3%)	14/30 (46.7%)	0.727	0.394
Yes	98/159 (61.6%)	61/159 (38.4%)		
I can choose safer sex with a man I have never had sex with before				
No	16/25 (64.0%)	9/25 (36.0%)	0.163	0.827
Yes	98/164 (59.8%)	66/164 (40.2%)		
I find it difficult telling a sex partner not to do something I think is risky				
No	22/32 (68.8%)	10/32 (31.2%)	1.144	0.285
Yes	92/157 (58.6%)	65/157 (41.4%)		
My friends use condoms I feel confident that I will never slip from safer sex				
No	26/39 (66.7%)	13/39 (33.3%)	0.828	0.363
Yes	88/150 (58.7%)	62/150 (41.3%)		
(I don't want to know the result, but have you ever had a HIV test?) You have ever had a HIV test				

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No	10/12 (83.3%)	2/12 (16.7%)	2.836	0.092
Yes	104/177 (58.8%)	73/177 (41.2%)		
Physical sensations, touching kissing, strong smell trigger Sex urge, tension, palpitation, masturbation urges, sexual disturbances				
Highly risky	39/66 (59.1%)	27/66 (40.9%)	0.318	0.853
Risky	41/65 (63.1%)	24/65 (36.9%)		
A little risky	34/58 (58.6%)	24/58 (41.4%)		
Images Pictures of being in a gay intimate session, fantasies Being rejected having anal sex with a man, pleasant & unpleasant sexual images.				
Highly risky	48/74 (64.9%)	26/74 (35.1%)	2.931	0.231
Risky	24/48 (50.0%)	24/48 (50.0%)		
A little risky	42/67 (62.7%)	25/67 (37.3%)		
Cognition/Thoughts. Sensitive, deviant unattractive, moral reject, unlovable, My life is controlled by outside forces				
Highly risky	44/64 (68.8%)	20/64 (31.2%)	2.875	0.238
Risky	28/50 (56.0%)	22/50 (44.0%)		
A little risky	42/75 (56.0%)	33/75 (44.0%)		
Interpersonal relationship strain. Lonely, attention seeking in men meeting joints, selective in friendships. Presence of a woman and so only close to men.				
Highly risky	51/78 (65.4%)	27/78 (34.6%)	1.591	0.0451
Risky	26/44 (59.1%)	18/44 (40.9%)		
A little risky	37/67 (55.2%)	30/67 (44.8%)		

Those doing their best to reduce chances of transmitting or getting infected with HIV and AIDS are more likely to use condom consistently. (P=0.022). Sexual impulse control and MSM social affiliations and network (P=0.022) Consistent condom use (P<0.001) are more likely to consistently and correctly use condoms. This demonstrates that there was a statistically significant relationship between consistent condom use and psychosocial demographics. Further

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this data shows that the intervention was effective in helping the participants identify their greatest barriers to their attempt to reduce their sexual risky behavior. .

Regarding personal risky behavior change resting on each individual MSM, (65.4%) of the control group said no while (34.6%) said yes.

On removing sexual behavior triggers to lower risky sex acts (59.5% in answered Yes while (34.6%) in control said No. (P=0.057).

On modifying sexual triggers setting (60.6%) Experimental responded Yes while control said No (P=0.015)

On narrowing relationship to reduce risky sexual behavior (61.5%) group responded Yes while 38.5%) control said No (P=0.456)

On getting accountable partner 62.7% said yes while (37.3%)l said no.

On exercise of impulse control, 60.5% said yes while (39.5%) said No.

On having done the best to reduce chances of transmitting or getting infected with HIV and AIDS 57.2% of said Yes while 42.8%) said No (P=0.004)

On sexual impulse control (63.6%) Experimental group responded with Yes while control response was No (36.4%) (P<0.022)

Logistic regression analysis was used for the data and the specific outcome behavioral indicators were consistent condom use and multiple sexual partners' reduction. Both of these are global measures describing behavior changes at any time since the beginning HIV and AIDS epidemic.

On how often partners used condom (52.7%) of answered – very often (47.3%) while the other responded with a good deal of time ((P<0.001).

On discussing HIV/AIDS or STDs with commercial partners (52.3%) responded with Yes while the others responded (77%) responded with No.

On discussing HIV and AIDS with any of non-paying partners (56.6%) said Yes, while (43.4%) said No (P<0.030).

On ever having an genital discharge during the past 2 months 64.1% said no while (35.9%) said Yes (P= 0.027). On anal discharge (63.1%) said No while (38.1%) said Yes (P<0.027).

On letting a partner know you want to have safer sex only (66.4%) said No while (33.6%) said No (P<0.026).

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Regarding avoidance of sexually risky situations (56.3%) Yes while 41.7% (P< 0.044)

On being controlled by outside forces in relations to risky sexual behavior (68.8%) admitted they are at risk while (31.2%) admitted being at a highly risky predisposition. These findings demonstrate that Multimodal therapy intervention has a large effect in reducing unprotected sex acts with consistent condom use, reduction of multiple sexual partners through participants' responsible sexual decision making . Further majority of the participants expressed the desire and willingness to reduce risky sexual acts (0.044).

Table: 18 present Logistic regression analysis on psychosocial characteristics and Condom use amongst MSM.

On suggestion: You have done your best to reduce chances of transmitting or getting infected with HIV had association with consistent condom use and multiple sex partners. Respondents who perceived they had done their best to reduce chances of transmitting or getting infected with HIV were more likely to have been using condom consistently (p=0.021)

Table 18: Logistic regression analysis showing the psychosocial characteristics and consistent condom use and multiple sex partners among MSM

Variable			Chi-square	p-value	OR;95% CI	p-value
You have done your best to reduce chances of transmitting or getting infected with HIV.	Exper	Cont				
No	15/16 (93.8%)	1/16 (6.2%)	8.163	0.004	1.00.	
Yes	99/173 (57.2%)	74/173 (42.8%)			0.089; 95% CI: 0.012 – 0.690	**0.021***
Rate your perceived greatest barriers to HIV risk behaviour change						
Sexual impulse and/or MSM	56/88 (63.6%)	32/88 (36.4%	9.656	0.022	0.727; 95% CI: 0.295 – 1.1791	0.489
Social affiliation						
HAART availability &/ or peer group acceptance	18/42 (42.9%)	24/42 (57.1%)			1.697; 95% CI: 0.625 – 4.606	0.299
All of the above	26/34 (76.5%)	8/34 (23.5%)			0.392; 95% CI: 0.128 –	**0.0100***

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					1.199	
Don't know	14/25 (56.0%)	11/25 (44.0%)			1.0	
During the last month you or your partner often used condom.						
Very often	27/34 (79.4%)	7/34 (20.6%)			0.069; 95% CI: 0.009-0.549	**0.012***
A good deal	13/14 (92.9%)	1/14 (7.1.%)			0.232; 95% CI: 0.092 – 0.587.	**0. 020***
			19.846	0.001		
Not much	27/34 (79.4%)	7/34 (20.6%)			0.608;-95%CI: 0.298 – 1.240	0.171
Not at all	13/14 (92.9%)	1/14 (7.1%)			000; n/a	0.999
Don't know	3/3 (100.0%)	0/3 (0.0%)			1.0	
You have discussed with your partners how to reduce chances of transmitting or being infected with HIV.						
No	47/61 (77.0%)	14/61 (23.0%)	10.535	0.001	1.0	
Yes	67/128 (52.3%)	61/128 (47.7%)			0.327; 95% CI: 0.164 – 0.652	**0.002**
You have ever discussed HIV/AIDS or STDs with some of your non-paying partners.						
No	28/37 (75.7%)	9/37 (24.3%)	4.534	0.033	1.0	
Yes	86/152 (56.6%)	66/152 (43.4%)			0.419; 95% CI: 0.185 – 0.948	**0.037***
You had a genital discharge during the past one months						
No	98/153 (64.1%)	55/153 (35.9%)	4.681	0.030	1.0	
Yes	16/36 (44.4%)	20/36 (55.6%)			2.227; 95% CI: 1.067 –	**0.033***

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					4.648	
You had an anal discharge during the last 2 months.						
No	106/168 (63.1%)	62/168 (36.9%)	4.874	0.027	1.0	
Yes	8/21 (38.1%)	1321 (61.9%)			0.360; 95% CI: 0.141 – 0.917	**0.032***
I have trouble letting a sex partner know that I want to have safer sex only						
No	79/119 (66.4%)	40/119 (33.6%)	4.944	0.026	1.0	
Yes	35/70 (50.0%)	35/70 (50.0%)			0.506; 95% CI: 0.277 – 0.926	**0.027***
I can avoid situations that I consider sexually risky						
No	12/14 (85.7%)	2/14 (14.3%)	4.074	0.044	1.0	
Yes	102/175 (58.3%)	73/175 (41.7%)			0.233; 95% CI: 0.051 – 1.072	0.061

Respondents who perceived that they had done their best to reduce chances of transmitting or getting infected with HIV and AIDS were more likely to have been using condoms consistently experimented 57.2% said Yes, 42.8% said No (8.163) P<0.004) control (93.8% and 60.2%), (P=0.0021)

Regarding sexual impulse controls and social affiliations, (63.6%) response was social affiliations while (36.4% cited Sexual impulse control (2 9.656) (P=0.022)]

On consistent condom use (59.6%) rated ‘a good deal’, while 40.4% rated ‘not much’ (P= 0.001) and P<0.012 and 0.002) respectively.

Regarding discussing with partners on how to reduce HIV and AIDS transmission (77%) said yes while (52.3%) said no (P<.001) (p<0.002)

On discussing HIV / AIDS and STDs with any non-paying partner (56.6%) responded yes while the control responded (43.4%) [P<0.033)(0.037)]. Regarding letting sex partner know you want only safe sex, 66.4% answered yes, and 33.6% no (P<0.026 and 0.027).

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On avoidance of situations considered risky (58.3%) responded yes while (85.7%) responded with a no [(P<0.044) (0.027)].

Psychosocial variables that had associations with both consistent condom use and multiple sexual partners are presented in logistic regressions here. Both of these are global measures describing behavior changes in many behavioral surveillance surveys at any time since the beginning of HIV and AIDS epidemic.

On having done the best to reduce chances of transmitting or contracting HIV and AIDS 57.2% reported yes while 42.8% responded with no(P=0.021).

On greatest barriers to HIV risky behavior change (67.6%) cited affiliation as opposed to (32.4%) who cited HAART. On multiple sexual partners and condom use, (79.4%) reported 'very often' as opposed to 20.6% who reported confidence in their partners (P=0.12)

On ever discussing HIV and AIDS transmission with non-paying partner (66.6%) reported discussing with partners and (43.4%) reported never.

On ever having had genital discharge (75.7%) said no while (24.3%) said yes (P=0.037).

On anal discharge (64.1%) said No while 35.9% said Yes (P=0.032)

On having trouble letting the sex partner know you want only safe sex 66.4% said No while 33.6% Yes (P=0.027)

On ability to avoid sexually risky situations (58.3%) said Yes (41.7%) said No (P=0.061). This demonstrates a big effect of the intervention that shows effectiveness of multimodal intervention by helping participants make responsible sexual decisions that reduced HIV and AIDS transmission risky behaviors.

Bivariate correlation between Age in Years and consistent condom use

Table 19 presents the correlation between Age in years and consisted condom use among the MSM in relation to background characteristics spear with ranks correlation Coefficient showed a positive linear relationship. Also between age at discovery of sex orientation and consistent condom use from zero, (r=0.164) to (P=0.024).that is statistically significant.

The data shows a low positive linear relationship between age at discovery of sex orientation and consistent condom use (r = -0.164) that is statistically significant. (p=0.024) (Table19). The results demonstrate that respondents' age at discovery of sex orientation and consistent condom use are positively correlated in the study population and this was statistically significant

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(p=0.024). This also demonstrates the efficacy of the intervention in increasing consistent condom use and reducing the number of sexual partners and thereby reducing HIV and AIDS risky transmission sexual behavior.

Table 19: Bivariate correlation between Age in years and consistent condom use

		Consistent condom use	Age at discovery of sex orientation
Consistent condom use	Spearman's rank Correlation	1	-0.164
	Sig. (2-tailed)		**0.024***
	N	188	188
Age at discovery of sex orientation	Spearman's rank Correlation	-0.164	1
	Sig. (2-tailed)	0.024	
	N	188	188

The results demonstrate that participant's age at discovery of sex orientation and consistent condom use are negatively correlated. In this study population and this was statistically significant (P=0.024).

Table 20 is a continuation of table 19.

On age in years – Spearman's correlation Coefficient showed low correlation between the age in years and consistent condom use (r=0.043)

The results demonstrated that the respondents age in years and consistent condom use are positively correlated in the study population and this was statistically significant (P=0.055). Spearman's rank correlation coefficient shows a low positive linear relationship between the age in years and consistent condom use (r = 0.043) that is statistically not significant from zero (p=0.055) (Table 8). The results demonstrate that respondents' age in years and consistent condom use are positively correlated in the study population and this was statistically significant (p=0.055).

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Table 20: Bivariate correlation between age in years and consistent condom use

		Age in years	Consistent condom use
Age in years	Spearman's rank Correlation	1	0.043
	Sig. (2-tailed)		0.055
	N	188	188
Consistent condom use	Spearman's rank Correlation	0.043	1
	Sig. (2-tailed)	0.055	
	N	188	188

Spearman's rank correlation coefficient shows a low negative linear relationship between the number of partners and consistent condom use (r = -0.019) that is statistically not significant from zero (p=0.0801) (Table 21). The results demonstrate that respondents' number of partners and consistent condom use are positively correlated in the study population and this was statistically significant (p=0.0801).

Table 21: Bivariate correlation between number of partners and consistent condom use

		Consistent condom use	Number of partners
Consistent condom use	Spearman's rank Correlation	1	-0.019
	Sig. (2-tailed)		0.0801
	N	188	188
Number of partners	Spearman's rank Correlation	-0.019	1
	Sig. (2-tailed)	0.0801	
	N	188	188

Spearman's rank correlation Coefficient shows a low positive linear relationship between the number of partners and consistent condom use r= (-0.019) that is statistically significant from zero (P=0.0801) Table 21. The results demonstrate that respondents' number of partners and consistent condom use are positively correlated in the study population and this was statistically significant (P=0.0801) table 21)

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Table 22: Follow up (end-line) assessment data

	Control	experimental	Chi-square	p-value
1in the last 30 days unprotected				
No	53 (46.1%)	89 (54.9%)	1.511	**0.029***
Yes	17 (60.7%)	11 (39.3%)		
2a 1Sex partners unprotected				
0	54 (47.9%)	4 (33.3%)		
1	8 (66.7%)	2 (40.0%)		
2	3 (60.0%)	1 (33.3%)		
4	2 (66.7%)	87 (52.1%)	1.009	**0.0404***
2a 2Sex partners protected				
0	53 (46.1%)	2 (40.0%)		
1	8 (66.7%)	4 (33.3%)		
2	4 (66.7%)	2 (33.3%)		
4	3 (60.0%)	86 (52.4%)	2.585	**0.046***
2b male sex HIV positive				
0	81 (47.1%)	0 (0.0%)	3.114	0.539
1	3 (75.0%)	1 (25.0%)		
2	2 (66.7%)	1 (33.3%)		
3	2 (66.7%)	1 (33.3%)		
4	1 (100.0%)	91 (52.9%)		
2c your sex HIV negative				
0	70 (48.6%)	74 (51.4%)	1.167	0.990
1	7 (53.8%)	6 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
4	3 (50.0%)	3 (50.0%)		
5	1 (50.0%)	1 (50.0%)		
2d your sex never				
0	77 (48.1%)	62 (53.9%)	3.728	0.811
1	14 (53.8%)	12 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
3	6 (54.5%)	5 (45.5%)		
4	3 (50.0%)	3 (50.0%)		
5	4 (80.0%)	1 (20.0%)		
6	1 (50.0%)	1 (50.0%)		
8	1 (100.0%)	0 (0.0%)		
3 lived with partners				
No	54 (50.0%)	54 (50.0%)	1.009	0.604

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Yes	40 (50.0%)	40 (50.0%)		
4 long partners				
No	42 (50.0%)	42 (50.0%)	0.000	1.000
Yes	52 (50.0%)	52 (50.0%)		
4 if yes HIV status				
1	2 (50.0%)	2 (50.0%)	2.271	0.321
2	42 (48.3%)	45 (51.7%)		
3	11 (68.8%)	5 (31.2%)		
5 unprotected sex				
No	36 (48.6%)	89 (51.4%)	1.811	**0.017***
Yes	10 (66.7%)	5 (33.3%)		
9b how many drinks				
0	36 (48.6%)	38 (51.4%)	0.031	1.000
1	8 (50.0%)	8 (50.0%)		
2	17 (50.0%)	17 (50.0%)		
3	3 (50.0%)	3 (50.0%)		
4	10 (50.0%)	10 (50.0%)		
5	2 (50.0%)	2 (50.0%)		
6	5 (50.0%)	5 (50.0%)		
7	1 (50.0%)	1 (50.0%)		
10	2 (50.0%)	2 (50.0%)		
10 was condom used				
No	36 (70.0%)	3 (30.0%)	1.690	
Yes	7(48.9%)	91 (51.1%)		**0.019***
10i any injectable drugs				
No	91 (50.0%)	91 (50.0%)	0.000	1.000
Yes	3 (50.0%)	3 (50.0%)		

Table 1: Socio-demographic characteristics by study groups at (pretest)

Characteristics	Control group	Experimental group	χ^2 statistics	p-value*
Number of participants	94	94	-	-
Education level				
Primary school	8 (8.51%)	5 (5.31%)	1.662	0.436
Secondary school	47 (50%)	55 (58.5%)		
Higher/College education	39 (41.5%)	34 (36.2%)		
Religion				
Christian	84 (89.3%)	81 (86.2%)	2.913	0.405
Muslim	8 (8.51%)	9 (9.6%)		
None	1 (1.0%)	4 (4.3%)		

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Others	1 (1.0%)	0 (0.0%)		
Ever married to a woman				
Yes	20	20	2.000	1.000
No	73	74		
Currently married				
Yes	10	13	1.416	0.493
No	84	81		

*p-values generated using Pearson's χ^2 tests for independence

	Control				Experimental			
	Mean	Lower Bound	Upper Bound	Std. Deviation	Mean	Lower Bound	Upper Bound	Std. Deviation
Age in years	26.20 years	25.09	27.31	5.415	25.33	24.23	26.44	5.366
Age at discovery of orientation	16.12 years	15.34	16.89	3.798	15.27	14.34	16.20	4.537

Table 2: The mean estimates of consistent condom use for the control and experimental groups.

Grouping	Time	Mean	Std. deviation	p-value
Control (n=94)	Time 0	0.4574	0.50086	$p = 0.754$
	Time 1	0.4362	0.49857	
Experimental (n=94)	Time 0	0.4362	0.49857	$p < 0.0001$
	Time 1	0.7128	0.45490	

Time 0- Stands for the pre-test; and Time 1 stands for the post-test.
Profile plot (Figure1)

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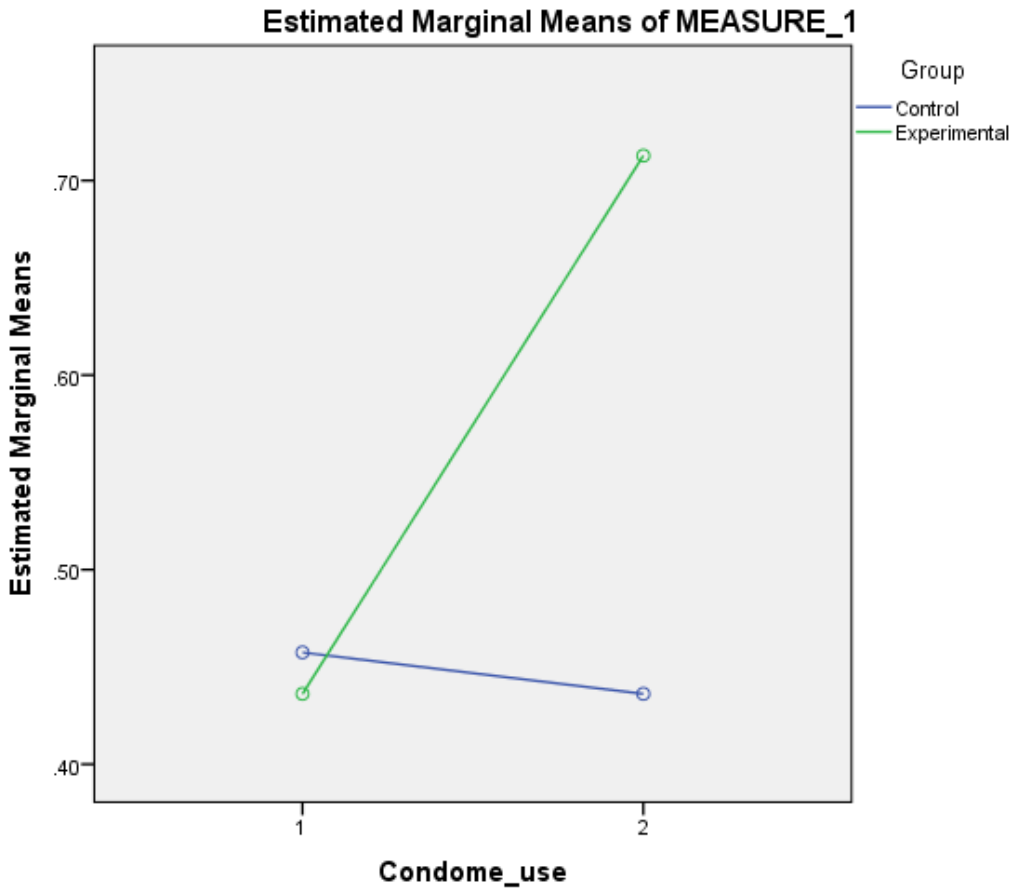

Table 3: Descriptive analysis of consistent condom use at pre-test and post-test among the control and experimental groups

	Grouping	Mean	Std. Deviation	N
Condom use – Pre-test	Control	0.4574	0.50086	94
	Experimental	0.4362	0.49857	94
	Total	0.4468	0.49849	188
Condom use – Post-test	Control	0.4362	0.49857	94
	Experimental	0.7128	0.45490	94
	Total	0.5745	0.49574	188

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Table 4: Difference-in-Differences Estimates of control and experimental groups in increasing consistent condom use among MSM in Nairobi , Kenya.

	**(1) Difference-in Differences Estimates (Group*Post-treatment)
Pre-test- Post-test	0.494 (p = 0.003)

** (1) The DD estimator is the interaction between treatment arms and post-treatment scores and these were determined using OLS method

Table 5: Consistent condom use proportions at pre-treatment and post-treatment at 10 weeks for control and experimental groups amongst MSM in Nairobi County, Kenya.

	Mean scores (SD)	
	Pre-treatment	Post - treatment/6 months
Control (n=94)	0.4574 (0.50086)	0.4362 (0.49857)
Experimental (n=94)	0.4362 (0.49857)	0.7128 (0.45490)

Table 6. a): Effect sizes for condom use from pre-treatment to post-treatment at 10 weeks follow-up for control and experimental group

	Pre/10 Wks-post-treatment (n=94)	
	Effect sizes	95% CI
Condom use	-0.390	-0.483 – -0.296

Table 7: Paired sample test: Mean outcome difference consistent condom use scores from pre-treatment to post-treatment at 10 weeks after the intervention for both control and experimental groups.

Difference in Differences	Mean difference scores (SD)	p-value
Control (n=94)	0.02128 (0.65548)	p =0.754
Experimental (n=94)	0.27660 (0.66242)	p < 0.0001

Table 8: Difference-in-Differences Estimates of control and experimental groups in increasing consistent condom use amongst MSM in Nairobi County, Kenya.

	**(1) Difference-in Differences Estimates (Group*Post-test)
Pre-test - Post-test	0.494 (p = 0.003)

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Table 9: Consistent condom use proportions at pre-treatment and post-treatment at 10 weeks for control and experimental groups amongst MSM in Nairobi County, Kenya.

	Mean scores (SD)	
	Pre-treatment	Post - treatment/10 weeks
Control (n=94)	0.4574 (0.50086)	0.4362 (0.49857)
Experimental (n=94)	0.4362 (0.49857)	0.7128 (0.45490)

Table 10: Paired sample test: Mean outcome difference consistent condom use scores from pre-test to post-test at 10 weeks follow-up for control and experimental groups

	Mean difference scores (SD)	p-value
Control (n=94)	0.02128 (0.65548)	p =0.754
Experimental (n=94)	0.27660 (0.66242)	$p < 0.0001$

Table 11: Effect sizes for condom use from pre-test to post-test at 10 weeks follow-up for control and experimental group

	Pre/10 Wks-post-treatment (n=94)	
	Effect sizes	95% CI
Condom use	-0.390	-0.483 – -0.296

Table 12: Shows the mean estimates of sexual partners for the control and experimental groups

Grouping	Time	Mean	Std. deviation	p-value
Control (n=94)	Pre-test	2.71	2.924	P = 0.861
	Post-test	5.09	3.528	
Experimental	Pre-test	2.97	2.499	$P < 0.001$
(n=94)	Post-test	2.89	3.036	

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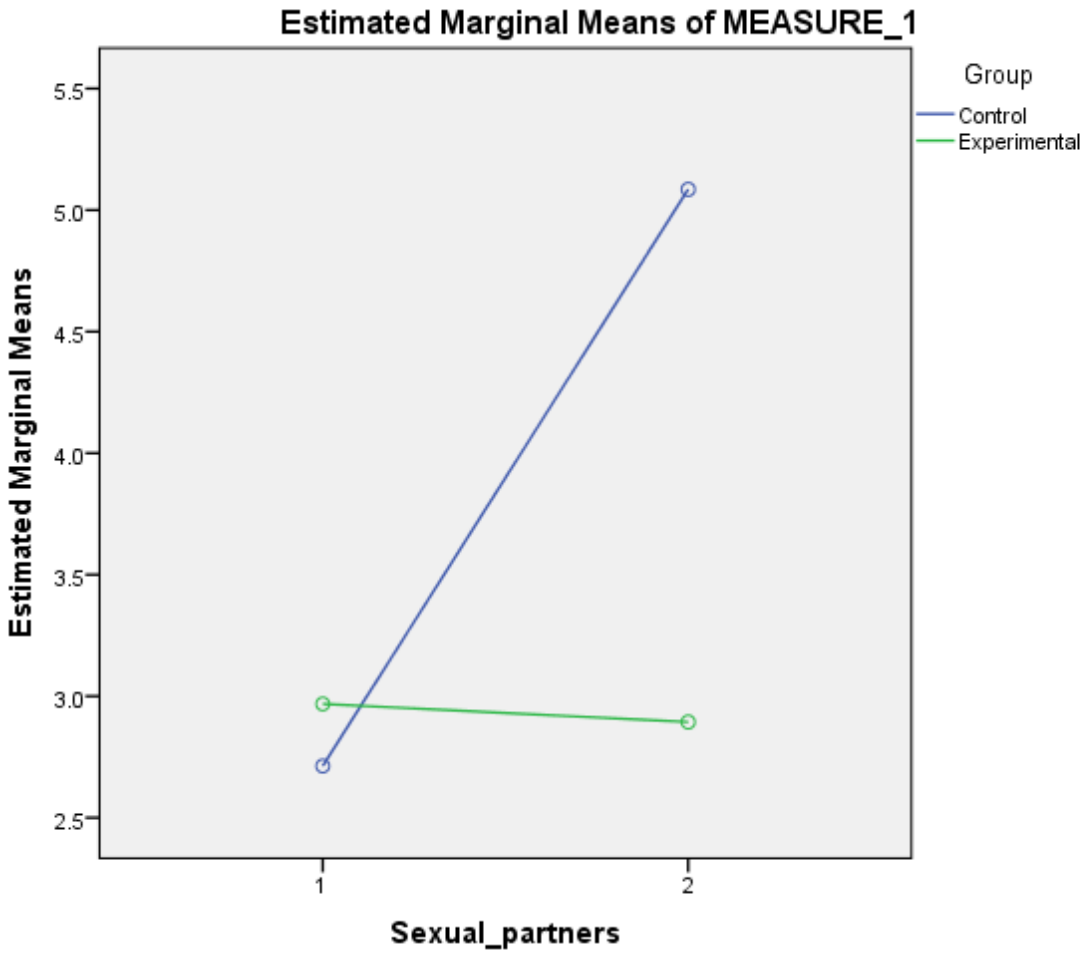

Table 13: Descriptive analysis of the number of sexual partners at baseline and post-treatment among the control and experimental groups

	Grouping	Mean	Std. Deviation	N
Sexual partners – Pre-test	Control	2.71	2.924	94
	Experimental	2.97	2.499	94
	Total	2.84	2.716	188
Sexual partners – Post-test	Control	5.09	3.528	94
	Experimental	2.79	2.936	94
	Total	3.99	3.461	188

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Table 14: Difference-in-Differences (DiD) Estimates of control and experimental groups among MSM in Nairobi county, Kenya.

	**(1) Difference-in Differences Estimates (Group*Post-treatment)
Pretest - Post-treatment	- 0.643 ($p < 0.0001$).

Table 16: Sexual partners mean scores at pre-treatment and post-treatment at 10 weeks for control and experimental groups.

	Mean scores (SD)	
	Pre-test	Post - test/10 weeks
Control (n=94)	2.71 (2.924)	5.09 (3.528)
Experimental (n=94)	2.97 (2.499)	2.89 (3.036)

Table 17: Effect sizes for sexual partners from treatment to post treatment at 10 weeks

	Pre/10 week post-treatment (n=94)	
	Effect sizes	95% CI
Sexual partners	-0.665	-0.191 – -0.140

Table 18: Univariate analysis for socio-demographic characteristics as predictors of HIV and AIDS risky sexual behavior among MSM in Nairobi, Kenya.

Variable	N (%)
Age in years	
<25 years	92/188 (48.7%)
25 – 35 years	85/188 (45.0%)
>35 years	12/188 (6.3%)
Religion	
Christian	166/188 (87.8%)
Muslim	17 (9.0%)
Others	6 (3.1%)
Education	
Primary	13/188 (6.9%)
Secondary	103/188 (54.5%)
Higher education/college	73 (38.6%)

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Having ever been married to a woman.	51/188 (27.0%)
Currently married and living with a female sexual partner.	37 (19.6%)
Consistently using condoms.	75/188 (39.7%)

Table 19: Univariate analysis of demographic characteristics amongst the MSM

	Range	Mean	Std Deviation	Variance
Year of birth	1966 – 1999	1990.96	5.612	31.493
Age in years	18 – 49	25.71	5.392	29.078
Age at discovery on orientation	2 – 30	15.77	4.099	16.804
Number of sexual partners in the last one month	0 -15	2.95	2.538	6.442

Table 20: Bivariable analysis for socio- demographic characteristics and consistent condom use among MSM

Variable	Use of condoms consistently		Pearsons-chi-square test	p-value
Age in years	No	Yes		
<25 years	56/92 (60.9%)	36/92 (39.1%)	0.572	0.751
25 – 35 years	52/85 (61.2%	33/85 (38.8%)		
>35 years	6/12 (50.0%)	6/12 (50.0%)		
Religion				
Christian	98/166 (59.0%)	68/166 (41.0%)	4.077	0.130
Muslim	10/17 (58.8%)	7/17 (41.2%)		
Others	6/6 (100.0%)	0/6 (0.0%)		
Education				
Primary	6/13 (46.2%)	7/13 (53.8%)	2.899	0.235
Secondary	59/103 (57.3%)	44/103 (42.7%)		
Higher education/college	49/73 (67.1%)	24/73 (32.9%)		
You have ever been married to a woman				
No	86/138 (62.3%)	52/138 (37.7%)	0.856	**0.05***
Yes	28/51 (54.9%)	23/51 (45.1%)		
You are currently married/living with a female sexual partner				

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No	95/152 (62.5%) 19/37 (51.4%)	57/152 (37.5%) 18/37 (48.6%)	1.545	**0.020***

Table 21: presents bivariate analysis of psychosocial characteristics and consistent condom use among MSM

Variable	No consistent condom use	Consistent condom use	Chi-square test	p-value
Personal HIV risky behaviour change starts with you				
No	17/26 (65.4%)	9/26 (34.6%)	0.323	
Yes	97/163 (59.5%)	66/163 (40.5%)		
				0.050*
Removing sexual arousal trigger behaviours is helps lowers risk acts				
No	17/26 (65.4%)	9/26 (34.6%)		0.570
Yes	97/163 (59.5%)	66/163 (40.5%)		
				0.015*
Modifying sensuous settings (changing environment) prevent risk acts				
No	34/57 (59.6%)	23/57 (40.4%)	0.323	0.902
Yes	80/132 (60.6%)	52/132 (39.4%)		
Narrowing relationships that expose one to HIV minimizes risk acts				
No	18/33 (54.5%)	15/33 (45.5%)	0.556	0457
Yes	96/156 (61.5%)	60/156 (38.5%)		
				0.0450
Getting an accountable partner for reinforcement reduces risk acts				
No	25/47 (53.2%)	22/47 (46.8%)	1.327	0323
Yes	89/142 (62.7%)	53/142 (37.3%)		
				0.0302
Exercise impulse control will prevent risk acts				
No	22/37 (59.5%)	15/37 (40.5%)	0.014	0.905
Yes	92/152 (60.5%)	60/152 (39.5%)		
				0.0143
Have often had alcoholic drinks during the last 4 weeks				

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Very often	21/34 (61.8%)	13/34 (38.2%)	3.289	0.511
A good deal	26/41 (63.4%)	15/41 (36.6%)		
Not much	36/62 (58.1%)	26/62 (41.9%)		
Not at all	27/48 (56.2%)	21/48 (43.8%)		
Don't know	4/4 (100.0%)	0/4 (0.0%)		
Have tried various types of drugs.				
Alcohol & cigarettes	35/51 (68.6%)	16/51 (31.4%)	2.210	0.530
Alcohol only	44/77 (57.1%)	33/77 (42.9%)		
Not at all	26/44 (59.1%)	18/44 (40.9%)		
Others	9/17 (52.9%)	8/17 (47.1%)		
You have tried to modify your sexual behavior since knowing your status.				
No	32/46 (69.6%)	14/46 (30.4%)	2.172	0.413
Yes	82/143 (57.3%)	61/143 (42.7%)		
				0.0141*
Have injected drugs in the last one month				
No	101/165 (61.2%)	64/165 (38.8%)	0.435	0.510
Yes	13/24 (54.2%)	11/24 (45.8%)		
The likelihood of transmitting or getting infected with HIV compared to other MSM				
Very likely	36/64 (56.2%)	28/64 (43.8%)	2.080	0.721
Somehow likely	29/49 (59.2%)	20/49 (40.8%)		
Likely	19/27 (70.4%)	8/27 (29.6%)		
Not likely	16/28 (57.1%)	12/28 (42.9%)		
Don't know	14/21 (66.7%)	7/21 (33.3%)		
Have you done my best to reduce chances of transmitting or getting infected with HIV				
No	15/16 (93.8%)	1/16 (6.2%)	**8.163**	**0.004***
Yes	99/173 (57.2%)	74/173 (42.8%)		
Rated your perceived greatest barriers to HIV risk behavior change				
Sexual impulse and/or MSM Social affiliation	56/88 (63.6%)	32/88 (36.4%	**9.656**	**0.022***
HAART availability &/ or peer group acceptance	18/42 (42.9%)	24/42 (57.1%)		
All of the above	26/34 (76.5%)	8/34 (23.5%)		

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Don't know	14/25 (56.0%)	11/25 (44.0%)		
In the past one month you have had sexual contact with another man. Indicate.				
Oral sex & Others	15/27 (55.6%)	12/27 (44.4%)	5.727	0.220
Anal sex only	39/67 (58.2%)	28/67 (41.8%)		
Anal sex & Others	13/23 (56.5%)	10/23 (43.5%)		
You touched the penis… &/or another man touched your penis	14/28 (50.0%)	14/28 (50.0%)		
All of the above	33/44 (75.0%)	11/44 (25.0%)		
In the past one month you had oral sex with a man, where a man put his penis in your mouth and you put yours in his mouth.				
No	61/95 (64.2%)	34/95 (35.8%)	1.209	**0.027***
Yes	53/94 (56.4%)	41/94 (43.6%)		
You or your partner often used condom during the last one month.				
Very often	43/91 (47.3%)	48/91 (52.7%)	**19.846**	**0.001***
A good deal	28/47 (59.6%)	19/47 (40.4%)		
Not much	27/34 (79.4%)	7/34 (20.6%)		
Not at all	13/14 (92.9%)	1/14 (7.1%)		
Don't know	3/3 (100.0%)	0/3 (0.0%)		
You ejaculated in another man's mouth or you partner ejaculated in your mouth.				
No	85/143 (59.4%)	58/143 (40.6%)	0.189	0.664
Yes	29/46 (63.0%)	17/46 (37.0%)		
You had anal sex with a commercial partner in the last one month.				
No	57/88 (64.8%)	31/88 (35.2%)	1.366	0.243
Yes	57/101 (56.4%)	44/101 (43.6%)		
You have ever discussed HIV/AIDS/STDs with any of your commercial sex partners.				
No	47/61 (77.0%)	14/61 (23.0%)		
Yes	67/128 (52.3%)	61/128 (47.7%)	**10.535**	**0.001***
You had anal sex with other partners in the last one month				
No	28/45 (62.2%)	17/45 (7.8%)	0.090	0.765
Yes	86/144 (59.7%)	58/144 (40.3%)		

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You have ever discussed HIV/AIDS/STDS with your non-paying partners				
No	28/37 (75.7%)	9/37 (24.3%)	**4.534**	**0.003***
Yes	86/152 (56.6%)	66/152 (43.4%)		
You have ever had sexual intercourses with women.				
No	45/68 (66.2%)	23/68 (33.8%)	1.523	0.278
Yes	69/121 (57.0%)	52/121 (43.0%)		
You have ever used a lubricant.				
No	8/11 (72.7%)	3/11 (27.3%)	0.751	0.386
Yes	106/178 (59.6%)	72/178 (40.4%)		
You have had diseases that can be transmitted through sexual intercourse.				
No	28/43 (65.1%)	15/43 (34.9%)	0.536	0.464
Yes	86/146 (58.9%)	60/146 (41.1%)		
You have had a genital discharge in the last 2 months.				
No	98/153 (64.1%)	55/153 (35.9%)	**4.681**	**0.003***
Yes	16/36 (44.4%)	20/36 (55.6%)		
You have had an anal ulcer or sore during the last 2 months.				
No	94/155 (60.6%)	61/155 (39.4%)	0.039	0.844
Yes	20/34 (58.8%)	14/34 (41.2%)		
You have had anal discharge in the last 2 months.				
No	106/168 (63.1%)	62/168 (36.9%)	**4.874**	**0.027***
Yes	8/21 (38.1%)	1321 (61.9%)		
Most MSM I meet only engage in safer sex practices.				
No	50/73 (68.5%)	23/73 (31.5%)	3.321	0.068
Yes	64/116 (55.2%)	52/116 (44.8%)		
I have trouble letting a sex partner know that I want to have safer sex only				
No	79/119 (66.4%)	40/119 (33.6%)	**4.944**	**0.026***
Yes	35/70 (50.0%)	35/70 (50.0%)		
I can choose safer sex with a man I have sex with regularly				
No	13/20 (65.0%)	7/20 (35.0%)	0.205	0.651
Yes	101/169 (59.8%)	68/169 (40.2%)		
I am able to avoid behaviour that may				

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put me at a risk of HIV infection				
No	12/15 (80.0%)	3/15 (20.0%)	2.637	0.104
Yes	102/174 (58.6%)	72/174 (41.4%)		
I find it hard to have sex with a man I have strong sexual feelings for				
No	68/115 (59.1%)	47/115 (40.9%)	0.173	0.678
Yes	46/74 (62.2%)	28/74 (37.8%)		
I find it difficult to have safer sex when high or drunk				
No	53/85 (62.4%)	32/85 (37.6%)	0.267	0.605
Yes	61/104 (58.7%)	43/104 (41.3%)		
I am less concerned about having anal sex without a condom now that new anti HIV combination treatments are available				
No	83/137 (60.6%)	54/137 (39.4%)	0.015	0.903
Yes	31/52 (59.6%)	21/52 (40.4%)		
Someone can talk me out of safer sex by persuading me they are HIV negative				
No	84/139 (60.4%)	55/139 (39.6%)	0.003	0.957
Yes	30/50 (60.0%)	20/50 (40.0%)		
If ever I did something risky, I am confident that I would go back to having safer sex right away				
No	28/41 (68.3%)	13/41 (31.7%)	1.391	0.238
Yes	86/148 (58.1%)	62/148 (41.9%)		
I can avoid situations that I consider sexually risky				
No	12/14 (85.7%)	2/14 (14.3%)	**4.074**	**0.044***
Yes	102/175 (58.3%)	73/175 (41.7%)		
I am confident that I can have safer sex even if my partner does not want				
No	16/30 (53.3%)	14/30 (46.7%)	0.727	0.394
Yes	98/159 (61.6%)	61/159 (38.4%)		
I can choose safer sex with a man I have never had sex with before				
No	16/25 (64.0%)	9/25 (36.0%)	0.163	0.827
Yes	98/164 (59.8%)	66/164 (40.2%)		
I find it difficult telling a sex partner not to do something I think is risky				
No	22/32 (68.8%)	10/32 (31.2%)	1.144	0.285

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Yes	92/157 (58.6%)	65/157 (41.4%)		
My friends use condoms I feel confident that I will never slip from safer sex				
No	26/39 (66.7%)	13/39 (33.3%)	0.828	0.363
Yes	88/150 (58.7%)	62/150 (41.3%)		
(I don't want to know the result, but have you ever had a HIV test?) You have ever had a HIV test				
No	10/12 (83.3%)	2/12 (16.7%)	2.836	0.092
Yes	104/177 (58.8%)	73/177 (41.2%)		
Physical sensations, touching kissing, strong smell trigger Sex urge, tension, palpitation, masturbation urges, sexual disturbances				
Highly risky	39/66 (59.1%)	27/66 (40.9%)	0.318	0.853
Risky	41/65 (63.1%)	24/65 (36.9%)		
A little risky	34/58 (58.6%)	24/58 (41.4%)		
Images Pictures of being in a gay intimate session, fantasies Being rejected having anal sex with a man, pleasant & unpleasant sexual images.				
Highly risky	48/74 (64.9%)	26/74 (35.1%)	2.931	0.231
Risky	24/48 (50.0%)	24/48 (50.0%)		
A little risky	42/67 (62.7%)	25/67 (37.3%)		
Cognition/Thoughts. Sensitive, deviant unattractive, moral reject, unlovable, My life is controlled by outside forces				
Highly risky	44/64 (68.8%)	20/64 (31.2%)	2.875	0.238
Risky	28/50 (56.0%)	22/50 (44.0%)		
A little risky	42/75 (56.0%)	33/75 (44.0%)		
Interpersonal relationship strain. Lonely, attention seeking in men meeting joints, selective in friendships. Presence of a woman and so only close to men.				
Highly risky	51/78 (65.4%)	27/78 (34.6%)	1.591	0.0451
Risky	26/44 (59.1%)	18/44 (40.9%)		
A little risky	37/67 (55.2%)	30/67 (44.8%)		

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Table 22: Logistic regression analysis showing the psychosocial characteristics and consistent condom use and multiple sex partners among MSM

Variable			Chi-square	p-value	OR;95% CI	p-value
You have done your best to reduce chances of transmitting or getting infected with HIV.	Exper	Cont				
No	15/16 (93.8%)	1/16 (6.2%)	8.163	0.004	1.00.	
Yes	99/173 (57.2%)	74/173 (42.8%)			0.089; 95% CI: 0.012 – 0.690	**0.021***
Rate your perceived greatest barriers to HIV risk behaviour change						
Sexual impulse and/or MSM Social affiliation	56/88 (63.6%)	32/88 (36.4%	9.656	0.022	0.727; 95% CI: 0.295 – 1.1791	0.489
HAART availability &/ or peer group acceptance	18/42 (42.9%)	24/42 (57.1%)			1.697; 95% CI: 0.625 – 4.606	0.299
All of the above	26/34 (76.5%)	8/34 (23.5%)			0.392; 95% CI: 0.128 – 1.199	**0.0100***
Don't know	14/25 (56.0%)	11/25 (44.0%)			1.0	
During the last month you or your partner often used condom.						
Very often	27/34 (79.4%)	7/34 (20.6%)			0.069; 95% CI: 0.009-0.549	**0.012***
A good deal	13/14 (92.9%)	1/14 (7.1.%)			0.232; 95% CI: 0.092 – 0.587.	**0. 020***
Not much	27/34 (79.4%)	7/34 (20.6%)	19.846	0.001	0.608;-95%CI: 0.298 – 1.240	0.171
Not at all	13/14 (92.9%)	1/14 (7.1%)			000; n/a	0.999
Don't know	3/3 (100.0%)	0/3 (0.0%)			1.0	
You have discussed with your partners how to reduce chances of transmitting or being infected with HIV.						
No	47/61 (77.0%)	14/61 (23.0%)	10.535	0.001	1.0	

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Yes	67/128 (52.3%)	61/128 (47.7%)			0.327; 95% CI: 0.164 – 0.652	**0.002**
You have ever discussed HIV/AIDS or STDs with some of your non-paying partners.						
No	28/37 (75.7%)	9/37 (24.3%)	4.534	0.033	1.0	
Yes	86/152 (56.6%)	66/152 (43.4%)			0.419; 95% CI: 0.185 – 0.948	**0.037***
You had a genital discharge during the past one months						
No	98/153 (64.1%)	55/153 (35.9%)	4.681	0.030	1.0	
Yes	16/36 (44.4%)	20/36 (55.6%)			2.227; 95% CI: 1.067 – 4.648	**0.033***
You had an anal discharge during the last 2 months.						
No	106/168 (63.1%)	62/168 (36.9%)	4.874	0.027	1.0	
Yes	8/21 (38.1%)	1321 (61.9%)			0.360; 95% CI: 0.141 – 0.917	**0.032***
I have trouble letting a sex partner know that I want to have safer sex only						
No	79/119 (66.4%)	40/119 (33.6%)	4.944	0.026	1.0	
Yes	35/70 (50.0%)	35/70 (50.0%)			0.506; 95% CI: 0.277 – 0.926	**0.027***
I can avoid situations that I consider sexually risky						
No	12/14 (85.7%)	2/14 (14.3%)	4.074	0.044	1.0	
Yes	102/175 (58.3%)	73/175 (41.7%)			0.233; 95% CI: 0.051 – 1.072	0.061

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Table 23: Bivariate correlation between Age in years and consistent condom use

		Consistent condom use	Age at discovery of sex orientation
Consistent condom use	Spearman's rank Correlation	1	-0.164
	Sig. (2-tailed)		**0.024***
	N	188	188
Age at discovery of sex orientation	Spearman's rank Correlation	-0.164	1
	Sig. (2-tailed)	0.024	
	N	188	188

Table 24: Bivariate correlation between age in years and consistent condom use

		Age in years	Consistent condom use
Age in years	Spearman's rank Correlation	1	0.043
	Sig. (2-tailed)		0.055
	N	188	188
Consistent condom use	Spearman's rank Correlation	0.043	1
	Sig. (2-tailed)	0.055	
	N	188	188

Table 25: Bivariate correlation between number of partners and consistent condom use

		Consistent condom use	Number of partners
Consistent condom use	Spearman's rank Correlation	1	-0.019
	Sig. (2-tailed)		0.0801
	N	188	188
Number of partners	Spearman's rank Correlation	-0.019	1
	Sig. (2-tailed)	0.0801	
	N	188	188

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Table 26: Follow up (end-line) assessment data

	Control	experimental	Chi-square	p-value
1in the last 30 days unprotected				
No	53 (46.1%)	89 (54.9%)	1.511	**0.029***
Yes	17 (60.7%)	11 (39.3%)		
2a 1Sex partners unprotected				
0	54 (47.9%)	4 (33.3%)		
1	8 (66.7%)	2 (40.0%)		
2	3 (60.0%)	1 (33.3%)		
4	2 (66.7%)	87 (52.1%)	1.009	**0.0404***
2a 2Sex partners protected				
0	53 (46.1%)	2 (40.0%)		
1	8 (66.7%)	4 (33.3%)		
2	4 (66.7%)	2 (33.3%)		
4	3 (60.0%)	86 (52.4%)	2.585	**0.046***
2b male sex HIV positive				
0	81 (47.1%)	0 (0.0%)	3.114	0.539
1	3 (75.0%)	1 (25.0%)		
2	2 (66.7%)	1 (33.3%)		
3	2 (66.7%)	1 (33.3%)		
4	1 (100.0%)	91 (52.9%)		
2c your sex HIV negative				
0	70 (48.6%)	74 (51.4%)	1.167	0.990
1	7 (53.8%)	6 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
4	3 (50.0%)	3 (50.0%)		
5	1 (50.0%)	1 (50.0%)		
2d your sex never				
0	77 (48.1%)	62 (53.9%)	3.728	0.811
1	14 (53.8%)	12 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
3	6 (54.5%)	5 (45.5%)		
4	3 (50.0%)	3 (50.0%)		
5	4 (80.0%)	1 (20.0%)		
6	1 (50.0%)	1 (50.0%)		
8	1 (100.0%)	0 (0.0%)		
3 lived with partners				
No	54 (50.0%)	54 (50.0%)	1.009	0.604

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Yes	40 (50.0%)	40 (50.0%)		
4 long partners				
No	42 (50.0%)	42 (50.0%)	0.000	1.000
Yes	52 (50.0%)	52 (50.0%)		
4 if yes HIV status				
1	2 (50.0%)	2 (50.0%)	2.271	0.321
2	42 (48.3%)	45 (51.7%)		
3	11 (68.8%)	5 (31.2%)		
5 unprotected sex				
No	36 (48.6%)	89 (51.4%)	1.811	**0.017***
Yes	10 (66.7%)	5 (33.3%)		
9b how many drinks				
0	36 (48.6%)	38 (51.4%)	0.031	1.000
1	8 (50.0%)	8 (50.0%)		
2	17 (50.0%)	17 (50.0%)		
3	3 (50.0%)	3 (50.0%)		
4	10 (50.0%)	10 (50.0%)		
5	2 (50.0%)	2 (50.0%)		
6	5 (50.0%)	5 (50.0%)		
7	1 (50.0%)	1 (50.0%)		
10	2 (50.0%)	2 (50.0%)		
10 was condom used				
No	36 (70.0%)	3 (30.0%)	1.690	
Yes	7(48.9%)	91 (51.1%)		**0.019***
10i any injectable drugs				
No	91 (50.0%)	91 (50.0%)	0.000	1.000
Yes	3 (50.0%)	3 (50.0%)		

Table 27: MSM perceptions on MMT BASIC ID modality skills in HIV and AIDS behavioral risk reduction

	Frequency	Percent
Q1After BASICID	48	51.1%
Q2 interact with others	39	41.5%
Q4 perceive rating of MMT	94	100.0%
Q5 being in touch	94	100.0%
Q6 learnt in influencing others		
1	72	76.6%
2	21	22.3%
3	1	1.1%
Q6i challenges		

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1	38	40.4%
2	36	38.3%
3	11	11.7%
4	9	9.6%
Q6bii empower others		
1	79	84.0%
2	15	16.0%
Q6biii perceive MMT panacea		
1	53	56.4%
2	30	31.9%
3	2	2.1%
4	9	9.6%

Table 28: Descriptive statistics of the MMT perceptions amongst respondents in experimental group.

	n	Minimum	Maximum	Mean		Standard deviation
				Statistic	Standard Error	
Q6a) Influencing others	94	1	3	1.24	0.047	0.456
Q6b) Challenges others	94	1	4	1.90	0.098	0.951
Q6c) Empower others	94	1	2	1.16	0.038	0.368
Q6d) MMT enhances cd	94	1	4	1.65	0.095	0.924
Q6e) MMT not panacea	94	1	3	1.12	0.037	0.355

Table 29.

Variable			Chi-square	p-value	OR;95% CI	p-value
You have done your best to reduce chances of transmitting or getting infected with HIV.						
No	15/16 (93.8%)	1/16 (6.2%)	8.163	0.004	1.00.	
Yes	**99/173 (57.2%)**	**74/173 (42.8%)**			**0.089; 95% CI: 0.012 – 0.690**	**0.021***
Rate your perceived greatest barriers to HIV risk behavior						

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change						
Sexual impulse and/or MSM Social affiliation	56/88 (63.6%)	32/88 (36.4%	9.656	0.022	0.727; 95% CI: 0.295 – 1.1791	0.489
HAART availability &/ or peer group acceptance	18/42 (42.9%)	24/42 (57.1%)			1.697; 95% CI: 0.625 – 4.606	0.299
All of the above	**26/34 (76.5%)**	**8/34 (23.5%)**			**0.392; 95% CI: 0.128 – 1.199**	**0.100***
Don't know	14/25 (56.0%)	11/25 (44.0%)			1.0	
During the last month you or your partner often used condom.						
Very often	**27/34 (79.4%)**	**7/34 (20.6%)**			**0.069; 95% CI:0.009-0.549**	**0.012***
A good deal	**13/14 (92.9%)**	1/14 (7.1 %)	19.846		**0.232; 95% CI:0.092– 0.587.**	**0.020***
Not much	27/34 (79.4%)	7/34 (20.6%)			0.608;-95%CI: 0.298 – 1.240	0.171
Not at all	13/14 (92.9%)	1/14 (7.1%)			000; n/a	0.999
Don't know	3/3 (100.0%)	0/3 (0.0%)			1.0	
You have discussed with your partners how to reduce chances of transmitting or being infected with HIV.						
No	47/61 (77.0%)	14/61 (23.0%)	10.535	0.001	1.0	
Yes	**67/128 (52.3%)**	**61/128 (47.7%)**			**0.327; 95% CI:0.164– 0.652**	**0.002***
You discussed HIV/AIDS or STDs with some of your non-paying partners.						
No	28/37 (75.7%)	9/37 (24.3%)	4.534	0.033	1.0	
Yes	**86/152 (56.6%)**	**66/152 (43.4%)**			**0.419; 95% CI:0.185– .948**	**0.037***
You have had a genital discharge during the past 2 months.						
No	98/153 (64.1%)	55/153 (35.9%)	4.681	0.030	1.0	

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Yes	16/36 (44.4%)	20/36 (55.6%)			2.227; 95% CI: 1.067 – 4.648	**0.033***
You have had an anal discharge during the last 2 months.						
No	106/168 (63.1%)	62/168 (36.9%)	4.874	0.027	1.0	
Yes	8/21 (38.1%)	1321 (61.9%)			0.360; 95% CI: 0.141 – 0.917	**0.032***
I have trouble letting a sex partner know that I want to have safer sex only						
No	79/119 (66.4%)	40/119 (33.6%)	4.944	0.026	1.0	
Yes	35/70 (50.0%)	35/70 (50.0%)			0.506; 95% CI: 0.277 – 0.926	**0.027***
I can avoid situations that I consider sexually risky						
No	12/14 (85.7%)	2/14 (14.3%)	4.074	0.044	1.0	
Yes	102/175 (58.3%)	73/175 (41.7%)			0.233; 95% CI: 0.051 – 1.072	**0.041***

30 days post intervention Follow up assessment

Table 30: Follow up data

	Control	experimental	Chi-square	p-value
1in the last 30 days unprotected				
No	17(60.7%)	89 (94%)	1.511	**0.029***
Yes	53 (46.1%)	5 (6.1%)		
2 a1Sex partners unprotected				
0	54 (47.9%)	87 (92.6%)	1.009	**0.0204***
1	8 (66.7%)	4 (33.3%)		
2	3 (60.0%)	2 (40.0%)		
4	2 (66.7%)	1 (33.3%)		
2 a 1.Sex partners protected				
0	53 (46.1%)	86 (92.4%)	2.585	**0.026***
1	8 (66.7%)	4 (33.3%)		
2	4 (66.7%)	2 (33.3%)		
4	3 (60.0%)	2 (40.0%)		

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2 b male sex HIV positive				
0	3 (75.1%)	91 (96.8%)	3.114	0.025
1	81 (47.1%)	1 (25.0%)		
2	2 (66.7%)	1 (33.3%)		
3	2 (66.7%)	1 (33.3%)		
4	1 (100.0%)	0 (0.0%)		
2 c your sex HIV negative				
0	70 (48.6%)	74 (78.7%)	1.167	0.039
1	7 (53.8%)	6 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
4	3 (50.0%)	3 (50.0%)		
5	1 (50.0%)	1 (50.0%)		
2 d your sex never				
0	77 (48.1%)	62 (65.9%)	3.728	0.038
1	14 (53.8%)	12 (46.2%)		
2	10 (50.0%)	10 (50.0%)		
3	6 (54.5%)	5 (45.5%)		
4	3 (50.0%)	3 (50.0%)		
5	4 (80.0%)	1 (20.0%)		
6	1 (50.0%)	1 (50.0%)		
8	1 (100.0%)	0 (0.0%)		
3 lived with partners				
No	54 (50.0%)	54 (57.4%)	1.009	0.0604
Yes	40 (50.0%)	40 (50.0%)		
4 long term partners				
No	52 (50.0%)	12 (16.0%)	0.000	
Yes	42 (50.0%)	82 (84.0%)		**0.001***
4 if yes HIV status				
1	2 (50.0%)	2 (50.0%)	2.271	0.321
2	42 (48.3%)	45 (51.7%)		
3	11 (68.8%)	5 (31.2%)		
5 unprotected sex				
No	10(66.7)	89 (94%)	1.811	**0.017***
Yes	36 (77.6%)	5 (33.3%)		
9b how many drinks				
0	36 (48.6%)	38 (51.4%)	0.031	1.000
1	8 (50.0%)	8 (50.0%)		
2	17 (50.0%)	17 (50.0%)		
3	3 (50.0%)	3 (50.0%)		
4	10 (50.0%)	10 (50.0%)		
5	2 (50.0%)	2 (50.0%)		

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6	5 (50.0%)	5 (50.0%)		
7	1 (50.0%)	1 (50.0%)		
10	2 (50.0%)	2 (50.0%)		
10 was condom used				
No	36 (70.0%)	3 (30.0%)	1.690	
Yes	7(48.9%)	91 (51.1%)		**0.019***

consistent condom use/ multiple Sexual partners ***P-Value***

Table 31:

Personal risky	Experimental		Control
Behavior starts with you	(59.5%)	40.5%	0.050
Removing arousal trigger	(59.5%)	40.5%	0.015
Risky relationships Narrowing	(61.5%)	38.5%	0.045
Getting accountable partner	(62.7%)	37.3%	0.030
Impulse control	(60.5%)	39.5%	0.014
Trend to modify setting	(57.3%)	42.7%	0.014
Have done your best to reduce	(57.2%)	57.2%	0.004
Sexual impulse/social affiliations	(63.6%)	36.4%	0.022
Condom use	(52.7%)	43.6%	0.001
Discussed HIV with partner	(52.3%)	47.7%	0.001
Reduced multiple partners	(56.6%)	43.4%	0.003

Table 32:

	Experimental group	Control group	P-value
Consistent condom use in the last 30 days	93%	60.7%	P=0.029
Condom use all times (yes)	51.1 %	48.9	P=0.019
Sex partners unprotected (NO)	52.1%	47.9%	P=0.040
Sex partners protected (NO)	52.4%	46%	P=0.046
Long term partners protected (YES)	84%	50.0%	P=0.001
Generally unprotected sex (NO)	51.4%	77.6%	P=0.017

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