



# Prospective examination of marital status as a determinant of sexual risk-taking behavior among inmates in KwaZulu-Natal and Mpumalanga Provinces, South Africa

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## ABSTRACT

**Background:** Among inmate populations in South Africa, there is limited information on how marital status impact heterosexual of the human immunodeficiency virus (HIV) transmission. One reason for the heightened number of HIV cases in South Africa is due to risk associated with heterosexual transmission. **Objective:** The present study explores the relationship between sexual behaviors of inmates; self-reported marital status, and locality of where inmates were incarcerated. **Methods:** This cross-sectional descriptive study of inmates, formed part of a larger longitudinal investigation of South African inmates. The study sites were four prisons in KwaZulu-Natal and Mpumalanga provinces. Odds ratios were used to examine associations between the dichotomized correlates and the outcome measure. **Results:** About 357 male inmates participated in the study. The majority of participants were Nguni speakers (96%). For the entire sample, two outcomes (being responsible for a pregnancy and willingness to have a HIV test) achieve a statistical significance level of  $P < 0.003$ . Married inmates in the KwaZulu-Natal prisons were 3 times more likely to have heard of sexually transmitted infections (STIs) prior ( $P < 0.007$ ) and 2.49 more likely to have had a STI than non-married inmates. **Conclusion:** Findings from this study highlights prior marital status and sexual risk behavior amongst inmates. This highlights the importance of understanding the relationship between socio-demographic variables, cultural influences, and ethnic practices and its implications for HIV/STI prevention among inmate populations.

**KEY WORDS:** Behavior, human immunodeficiency virus, inmates, prevention, prison, sexually transmitted infections

## INTRODUCTION

In South Africa, the acquired immune deficiency syndrome (AIDS) pandemic has contributed significantly to the mortality rates across the nation and especially in rural areas [1]. The seroprevalence rate for the country has been estimated at over 10% [2]. One reason for the heightened number of cases in Sub Saharan countries including South Africa is due to risk associated with heterosexual transmission [3-6]. Moreover, many of these new cases are contracted by women who are married, in long-term or in stable relationships with men [7,8].

For example, one study of 416 women in Kwazulu-Natal that were screened for antibodies to human immunodeficiency virus (HIV) and herpes simplex virus-2 (HSV-2) concluded that 50% of the women were HIV-1 seropositive, and 84% were HSV-2 seropositive [9].

Given the impact of heterosexual transmission among women, it is essential that we examine and understand the risk practices and demographic factors among men with respect to how they contribute to this problem. One specific population of importance includes inmates. Among inmate populations, there is limited

information on how such factors place their partners at risk, most of which were conducted outside of South Africa [10-12]. In South Africa, there are 238 prisons that comprise the prison system containing approximately 175,000 to 180,000 inmates [13].

Thus, it is essential that researchers explore the sexual practices and demographic factors that may place the partners of South African inmates that return to the community at risk for HIV/AIDS and other sexually transmitted infections (STIs). Inmate populations tend to display a multitude of high risk practices that increased their risk of both contracting and spreading STIs [13].

The present study explores the relationship between sexual activities of inmates; self-reported marital status, and the provincial region of where inmates were incarcerated. The goal of this study is to outline factors and differences in behaviors that can be used to enhance HIV/STI risk reduction interventions for inmate populations, specifically with respect to the South African milieu. In this process, we will describe the characteristics of a random sample of inmates from two provinces in South Africa and determine if there were any differences regarding self-reported sexual activity and marital status with respect to prison location in terms of province.

## METHODS

### Study Design

This cross-sectional descriptive study of inmates, formed part of a larger longitudinal investigation designed to implement a health education intervention for prison inmates in South Africa. The study sites were four prisons in the provinces of KwaZulu-Natal (KZN) which were located in small rural towns and Mpumalanga (MP) provinces where the selected correctional facilities were in large urban settings. Eshowe and Umzinto prisons were selected in KZN and Middelburg and Witbank prisons were selected in MP. These prisons sites were selected after taking into account the necessity of a post-release follow-up with the participants in their communities, as the intervention was a 12 months long cohort study. The four selected prisons were housing a total number of about 3022 inmates. To participate, inmates had to be expecting to exit prison within 3 months after participating in the intervention program. Prior to study implementation, IRB approval was received from the South African Medical Association Research Ethics Committee.

A total of 362 inmates were selected to participate in the intervention program of which 357 consented to participating in the study and thus provided the information for the baseline questionnaire. Participants were mainly of African Black men who were Nguni language speakers. Most people who speak this group of languages are fluent in Zulu which is the most commonly spoken dialect of all the Nguni languages.

### Study Instrument

The interview instrument was designed on information that was obtained through focus group interviews conducted during a

preliminary qualitative study that was conducted in four prisons as a situational analysis of the South African prison health system. In addition to demographic variables such as province, age, ethnicity, level of education, employment history, marital status, the questionnaire measured the knowledge and beliefs about causes and transmission of STIs including HIV/AIDS, attitudes toward condom use and people living with HIV/AIDS, sexual communication, social norms about gender relations, and sexual violence, self-efficacy and skills for practicing safer sex and health promoting practices in prison, and the impact of alcohol and marijuana on risky sexual risk taking.

The interview instrument was prepared in English and translated from English to Zulu. To ensure the accuracy of the translations, the Zulu version of the questionnaire was back translated to English by a team of research assistants who were involved in the project as data collectors and health educators.

### Data Analysis

Demographic variables was analyzed using the statistical software SPSS, version 21.0 (IBM SPSS, 2013). Frequencies and descriptive statistics were calculated for each item in the interview instrument both at data cleaning and analysis stages. Significance of the bivariate associations between the dichotomized correlates and the outcome measure was examined using contingency table analyses. Potency of the bivariate associations was measured by calculating odds ratios, 95% confidence intervals, and corresponding *P* values.

## RESULTS

### Demographic Profile of Participants

A total of 357 inmates participated in the study. Participant's ages ranged from 17 years old to 55 years old with a mean age of 27 years. (Table 1) The majority of study participants were Nguni speaking African Black men (96%). Nearly 8% of the participants had no formal education and less than half (47%) reported that they only had primary school education. A total of 50% were unemployed at the time of arrest and 37% were holding jobs paying under R10000 (\$1300) per annum. A large proportion of the selected participants (65%) were offenders serving a prison sentence for the first time.

Inmates mean age was 30 years old in Mpumalanga and 28 years old in KwaZulu-Natal. In addition, participants reported being incarcerated for an average period of about 4 years in Mpumalanga and 3 years in KwaZulu-Natal. In Mpumalanga, of 67.2% of inmates were serving prison sentences for the first time in their lives and similarly in KwaZulu-Natal (63.3%). Of the participants about 84% were living in their own home or with their families before arrest and only 1.8% was living with their friends who were also involved in criminal activities. A total of 49.6% were unemployed at the time of arrest and 54.5% either had an average of 4 years of formal education or were illiterate (8%). About 66.2% had been married before they entered prison.

**Table 1: Socio-demographic profile of participating inmates (n=357)**

Variables	Frequency	Percentage
<b>Race</b>		
Black	343	96
White	4	1
Indian	2	1
“Mixed race”	7	2
<b>Marital status</b>		
Married	231	66
Not married	118	34
<b>Education level</b>		
No formal education	27	7.6
Primary school	166	46.5
Grade 10	93	26.1
Grade 12	71	19.8
<b>Employment history</b>		
Unemployed	177	49.6
Under \$1000	132	37.0
\$1000-\$1999	35	9.8
\$2000-\$2999	13	3.4
<b>Criminal history</b>		
First time offender	233	65.3
Repeat offender	124	34.7
<b>Living arrangements</b>		
Family/own home	300	84
<b>Prior to arrest</b>		
Fellow criminals	6	1.8
Other	51	12.2

### Bivariate Associations

Table 2 provides bivariate associations between marital status and selected correlates observed at baseline for the entire sample of inmates. Approximately, 37% of those who were married reported using a condom/barrier when they had sex prior to incarceration. Only two outcomes (being responsible for a pregnancy and reporting being willing to have a HIV test) achieved a statistically significant level of  $P < 0.003$ . Inmates did not differ about having an STD albeit married inmates were 1.4 times more likely than non-married inmates to report having had an STI.

Table 3 provides details of the logistic analyses for inmates from KwaZulu-Natal. Inmates who were married were 1.2 times less likely to report using a condom/barrier during sex prior to incarceration. Inmates who were not married prior to incarceration were 4.8 times more likely to report that they had previously had sex with someone where there was an exchange of money or drugs. Inmates who were married prior to incarceration were more than 3 times and 2.5 times more likely to have heard about STIs ( $P < 0.007$ ) and have had a STI ( $P < 0.009$ ). Married inmates in the KwaZulu-Natal prisons were 3 times more likely to have heard of STIs prior ( $P < 0.007$ ) and 2.49 more likely to have had a STI than non-married inmates. Based on the data presented in Table 4, there were no statistical significant differences among inmates based on marital status on any of the selected correlates. It is also essential to note that the rates of anal sex among sample participants were extremely low for the entire population as well by province where inmates were incarcerated.

**Table 2: Bivariate associations between the outcome measures and selected correlates in the study population (n=357)**

Correlate	% Married	OR	CI	P value
When you had sex, Did you use a protective barrier (Condom)?				
Yes	29.5			
No	37.2	1.03	0.65-1.63	0.87
Before you were imprisoned, did you ever have sex with someone to get money or drugs?				
Yes	5.3			
No	61.7	1.83	0.66-5.07	0.23
Have you ever willingly/unwillingly had anal sex?				
Yes	2.6			
No	63.0	0.49	0.19-1.27	0.14
Have you ever been responsible for a pregnancy?				
Yes	42.9			
No	23.7	1.98	1.25-3.13	0.003
Was any pregnancy unplanned?				
Yes	40.4			
No	26.7	1.33	0.84-2.10	0.22
Would you have an HIV test?				
Yes	60.6			
No	6.1	0.18	0.04-0.81	0.01
Ever heard of STIs?				
Yes	59.0			
No	7.7	1.65	0.87-3.11	0.11
Ever had a STI?				
Yes	37.8			
No	28.0	1.42	0.91-2.23	0.12

% Married: Marital status prior to incarceration, OR: Odds ratio, CI: Confidence intervals, STIs: Sexually transmitted infections, HIV: Human immunodeficiency virus

### DISCUSSION

In this sample of South African inmates, we examined the impact that marital status can have on STI risk practices, specifically those related to HIV/AIDS. These results corroborate findings from other studies identifying the lack of condom use [14,15] and increased rates of heterosexual transmission [3,16] among married couples. This study also observed an association between a marital status, willingness to be tested for HIV and prior history of STIs. This was particularly noted with respect to inmates housed in the KwaZulu-Natal prisons where the correctional facilities were in a predominantly rural setting. Inmates incarcerated in the KwaZulu-Natal facilities were more likely to report transactional sex compared to the other province which may be due to higher poverty rates in rural areas. Although the findings indicate that the magnitude of the associations observed is substantial for the entire sample of inmates in this study, no significant differences were observed with respect to inmates in Mpumalanga regarding the selected correlates and self-reported marital status.

Research in the area of inmate health, specifically infectious disease prevention may provide a useful framework for understanding the association between cultural and ethnic influences on HIV and STI risk practices among inmates as it relates to heterosexual transmission [17]. The prevalence of problem behaviors

**Table 3: Bivariate associations between the outcome measures and selected correlates for KwaZulu-Natal (n=180)**

Correlate	% Married	OR	CI	P value
When you had sex, did you use a protective barrier (Condom)?				
Yes	36.6			
No	37.7	1.10	0.56-2.18	0.76
Before you were imprisoned, did you ever have sex with someone to get money or drugs?				
Yes	7.4			
No	66.9	4.88	0.62-38.4	0.09
Have you ever willingly/unwillingly had anal sex?				
Yes	2.9			
No	71.1	0.41	0.11-1.62	0.19
Have you ever been responsible for a pregnancy?				
Yes	46.6			
No	27.6	1.92	0.97-3.82	0.05
Was any pregnancy unplanned?				
Yes	44.0			
No	30.3	1.81	0.91-3.60	0.08
Would you have an HIV Test?				
Yes	65.5			
No	8.0	0.18	0.02-1.41	0.07
Ever heard of STIs?				
Yes	65.7			
No	8.4	3.07	1.33-7.09	0.007
Ever had a STI?				
Yes	42.9			
No	30.3	2.49	1.25-4.98	0.009

% Married: Marital status prior to Incarceration, OR: Odds ratio, CI: Confidence intervals, STIs: Sexually transmitted infections, HIV: Human immunodeficiency virus

among married inmates if not dealt with via HIV risk reduction interventions, may add to the problem of increasing HIV rates in South Africa, since most inmates eventually return to the communities from which they lived prior to incarceration [18]. Health care providers working with incarcerated population can use the information presented in this article to provide appropriate counseling and education required for effective STI/HIV prevention interventions for soon to be released inmates as part of preparation for community re-integration [19].

The present study is not without limitations. First, we employed both self-report data and used a retrospective research design to examine the association between marital status and inmate's sexual health practices prior to the inmates being incarcerated. Moreover, these data examine the association between marital status and risk behaviors that occurred prior to incarceration, as opposed to examining risk behaviors from a future time oriented perspective. Thus, the analysis does not allow us to examine the presence of risk behaviors that may have been developed while incarcerated which may have an impact on how inmates will behave upon release from prison. Such risk behaviors could increase inmates risk for both contracting and transmitting STIs such as HIV/AIDS when they get back into the community [20-23]. Another concern is that the findings of this study may only be generalizable to inmates in South Africa as opposed to inmates in other African countries and around the world.

**Table 4: Bivariate associations between the outcome measures and selected correlates for Mpumalanga (n=177)**

Correlate	% Married	OR	CI	P value
When you had sex, did you use a protective barrier (Condom)?				
Yes	22.0			
No	36.6	0.85	0.45-1.61	0.63
Before you were imprisoned, did you ever have sex with someone to get money or drugs?				
Yes	3.1			
No	56.2	0.85	0.22-3.29	0.81
Have you ever willingly/unwillingly had anal sex?				
Yes	2.6			
No	54.3	0.58	0.15-2.27	0.43
Have you ever been responsible for a pregnancy?				
Yes	39.0			
No	19.5	2.12	1.12-4.01	0.02
Was any pregnancy unplanned?				
Yes	36.4			
No	22.8	1.10	0.58-2.09	0.76
Would you have an HIV test?				
Yes	54.9			
No	3.9	0.22	0.02-1.92	0.14
Ever heard of STIs?				
Yes	51.6			
No	6.8	0.88	0.32-2.40	0.80
Ever had a STI?				
Yes	32.3			
No	25.5	0.94	0.50-1.77	0.85

% Married: Marital status prior to incarceration, OR: Odds ratio, CI: Confidence intervals, STIs: Sexually transmitted infections, HIV: Human immunodeficiency virus

In summary, these findings accent the public health value of understanding the relationship between demographic variables, locality of correctional facilities, cultural influences, and ethnic practices and its implications for HIV/STI prevention. Assisting inmates to deal with HIV risk behaviors could be an essential element in reducing the transmission HIV and other STIs once they are reintegrated in the general community. Future studies are needed to explore, the mechanisms through which sexual practices on married inmates in comparison to non-married inmates, in concert with locality of correctional facility and incarceration may impact on HIV transmission in South Africa.

## AUTHORS' CONTRIBUTIONS

TTS, RB, and PR designed the study protocol; SS, PR, RB implemented the study; SS was responsible for the data collection; TTS and SS carried out the statistical analysis and interpretation of these data; TTS conducted and drafted the literature review. TTS and SS drafted the manuscript. RB and PR critically revised the manuscript for intellectual content. All authors read and approved the final manuscript. TTS and SS are guarantors of the paper.

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