AN EXPLORATION OF CONDOM USE AMONG MALE CONSTRUCTION WORKER CLIENTS OF FEMALE SEX WORKERS IN THE WESTERN CAPE

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This study investigated condom use among male construction workers who engage with female sex workers in the Western Cape, South Africa. It used three self-reported measures of condom use with a sex worker: condom use at last sex, frequency of condom use in the past 3 months, and intention to use a condom at next sex. Cross-sectional data were collected from 227 participants across 18 sites representing 7 firms. Multiple linear regression identified several determinants of condom use frequency, including risky sexual behaviour, HIV/AIDS knowledge, and control over condom use. The likelihood of using a condom at next encounter was influenced by drug consumption, HIV/AIDS knowledge, control over condom use, and a positive attitude toward condom use. Binomial logistic regression showed that workers with higher levels of risky sexual behaviour were 1.08 times more likely to have used a condom at last sex, with no other variables being significant. The study emphasizes the complex factors influencing condom use and the value of methodological triangulation in cross-sectional survey design, enhancing the precision of assessment of condom use.

Keywords: male construction workers; male clients of female sex workers; condom use; HIV/AIDS

INTRODUCTION

Approximately 10% of sexually active men in sub-Saharan Africa report paying for sex, and those who do so are 50% more likely to be living with HIV (Hodgins *et al.,* 2022). While female sex workers (FSWs) are often central to HIV intervention programs, modelling studies suggest that male clients may be responsible for up to 42% of new heterosexual HIV infections, with only 5% being directly attributable to FSWs (Stone *et al.,* 2021). Factors that hinder consistent condom use include client preferences, financial incentives for unprotected sex, substance use, and a low perceived risk of STIs (George *et al.,* 2019). Additionally, fear of violence from clients limits FSW's ability to negotiate condom use (Gore *et al.,* 2020), with 43% of FSW in Soweto, South Africa (SA), reporting physical or sexual violence in 2016, and 14% reporting rape by a client (Coetzee *et al.,* 2017). Despite their central role in the transmission chain, male clients of sex workers (MCSW) are frequently excluded

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from HIV research and programming due to stigma, legal risks, and recruitment challenges (Morse-Karzen, 2020). Consequently, some scholars have highlighted a need for more targeted interventions addressing gender norms, violence, and HIV prevention among MCSW in SA (Huschke and Coetzee, 2020).

LITERATURE REVIEW

Despite a growing recognition of the link between male-dominated, mobile occupations, elevated HIV risk and transactional sex, MCSW remain significantly under-researched. Much of the existing literature focuses on the vulnerabilities of FSWs or on phenomena such as age-disparate relationships (e.g., "blessers") (Stoner *et al.,* 2021). Moreover, studies rarely differentiate among occupational subgroups or examine the unique psychosocial and structural vulnerabilities associated with specific forms of work. Research on miners (Campbell, 2000), truck drivers (Delany-Moretlwe *et al.,* 2014), and military personnel (Mankayi, 2006) in SA has documented patterns of transactional sex, limited access to healthcare, and low condom use. The construction industry shares many of the same risk-enhancing characteristics - a predominantly male workforce, spatial mobility, job insecurity, and informal employment arrangements. In SA, Meintjes *et al. (*2007) found that construction workers face structural vulnerabilities that increase their risk of HIV. Relatedly, Bowen *et al. (*2017) identified age, gender, and education as indirect determinants of condom use. Notably, their findings suggest that lower levels of HIV/AIDS-related knowledge were paradoxically associated with better condom use, implying that knowledge alone may not predict safe sexual behaviour in this population. Compounding this, adherence to non-scientific beliefs about disease (Govender *et al.,* 2017) and normative expectations of masculinity (Stern and Buikema, 2013) further constrain the ability and willingness of male construction workers to engage in protective behaviours or health-seeking practices.

Despite these findings, the specific pathways through which occupational stressors and behavioural norms shape condom use among MCSW in the construction industry remain poorly understood. Existing studies tend to treat MCSW as a homogeneous group, often ignoring differences in employment status, work culture, and educational background. This limits the effectiveness of public health interventions, which require nuanced, context-specific approaches grounded in the lived realities. While previous research has highlighted the structural risks associated with construction work, few studies have examined the psychosocial mechanisms underlying condom use—especially in the context of MCSW. A recent study by Yakubu *et al. (*2025) addressed this gap by examining the psychological factors influencing condom use intentions among MCSW in Western Cape, SA. Utilising a cross-sectional survey, the study assessed how past condom use relates to condom use intentions. The findings revealed that both self-efficacy and positive attitudes toward condom use significantly mediated the relationship between past condom use and intention to use condoms, while perceived norms did not show a significant mediating effect. This research underscores the importance of targeting psychological constructs, particularly self-efficacy and attitudes toward condom use, in interventions aimed at promoting consistent condom use within this population.

A limitation in the work of Yakubu *et al. (*2025) is that condom use is primarily assessed at a single point in time (e.g., condom use at last sex), which may obscure important temporal variations in both behaviour and intention. While such a measure is commonly used in public health research for its simplicity, it does not account for

fluctuations in individual motivation, risk perception, or contextual factors that influence condom use over time. Specifically, it fails to capture the dynamic and situational impact of psychosocial determinants such as attitudes toward condoms, perceived social norms, self-efficacy, and substance use, all of which can vary across sexual encounters. There is increasing support for triangulating self-reported condom use measures - combining point-specific, retrospective, and prospective indicators - to provide a more comprehensive understanding of sexual risk behaviour (Fenton *et al.,* 2001). However, studies applying such approaches among MCSW are rare. Equally underutilised is the application of behavioural theory in designing interventions (Glanz and Bishop, 2010).

This study addresses several critical gaps in the literature:

- Occupational specificity: It identifies construction workers as a distinct at-risk group, rather than aggregating them with other mobile or informal workers.

- Gendered analysis: It interrogates how constructions of masculinity intersect with occupational contexts to influence sexual behaviour.

- Theory application: It applies behavioural science frameworks to assess condom use.

- Measurement innovation: It triangulates behavioural data to capture point-specific, retrospective, and prospective condom use indicators.

Policy relevance: It aligns with global calls for inclusive, gender-responsive, and occupation-specific HIV interventions.

By foregrounding these dimensions, the construction workplace emerges as a critical site where behavioural science, occupational health, and HIV prevention efforts can converge to drive meaningful change. Moreover, the present study deepens our understanding of HIV vulnerability among MCSW in construction and highlights the need for targeted, context-sensitive interventions.

Theoretical Framework

Several health behaviorur theories have been used to explain condom use and HIV-related decision-making, particularly among high-risk populations. Two prominent models underpin this study: the Health Belief Model (HBM) (Abraham and Sheeran, 2015) and the Reasoned Action Approach (RAA) (Fishbein and Ajzen, 2010). The HBM posits that behaviorur is influenced by perceived susceptibility to a health threat, perceived severity of that threat, perceived benefits and barriers to action, and cues to action (Abraham and Sheeran, 2015). In the context of HIV prevention, these constructs can help explain why individuals may or may not engage in condom use. For instance, knowing someone who died from AIDS can increase perceived severity and susceptibility, thereby influencing safer sexual behaviorur. The RAA builds on the theory of planned behaviorur, emphasizing attitudes, perceived norms, and perceived behavioral control as predictors of condom use intention, which in turn predicts behaviorur (Fishbein and Ajzen, 2010). Prior research supports the predictive utility of these two models across various populations (Buldeo and Gilbert, 2015; Kabikira, 2010). However, there is limited application of these theories among MCSW in SA. This gap underscores the value of theory-driven, survey-based research like the present study.

METHOD

Participants and Setting

A convenience sampling method was used to select construction companies and workers for data collection. The sample included all male employees on-site during scheduled field visits across 18 construction sites from 7 companies in the Western Cape, SA. Participants ranged from unskilled workers to skilled tradesmen, site clerks, and technicians. Questionnaires were available in English, Afrikaans, and IsiXhosa, the region's most spoken languages. Participants were informed the survey was voluntary, confidential, and anonymous. Completion time varied based on education and literacy, but analysis showed good question comprehension. Data collection occurred from mid-March to June 2019, with ethical approval granted by the researchers' university (8th March 2019).

Measures of Condom Use

Accurately measuring sexual behaviour is inherently challenging due to participation bias, recall issues, and respondents' willingness to accurately report on their sexual activities (Fenton *et al.,* 2001). This paper employs three distinct approaches to measure condom use with a FSW - condom use at last sex, frequency of condom use in the past 3 months, and intention to use a condom at next sex - each addressing different aspects of usage, thereby enhancing the robustness of our findings.

Condom use at last sex (HCU): This approach assesses whether the respondent used a condom during the most recent sexual encounter with a FSW ('yes' or 'no'). It provides immediate and specific insight at a particular point, but it does not capture patterns or trends over time.

Frequency of condom use in the last 3 months (PCU): This approach evaluates how often condoms were used, independent of intercourse frequency. A 5-point Likert scale from 'never' to 'always' was employed.

Intention to use a condom at next sex (FCU): This approach involved asking respondents how likely they are to use a condom at the next sexual encounter with a FSW ('never' to 'always'). Comparing the determinants of the three measures of condom use allows for nuanced insights that are critical for developing targeted interventions and understanding complex behaviours within the population of MCSW.

Determinants of Condom Use

The dependent variables comprised the three measures of condom use described above. Based on the HBM and the RAA, demographic, experiential, behavioural, and cognitive variables were explored as determinants of condom use in the regression analysis (see Table 1).

Demographic variables (D) include age, education, relationship status, employment status, and province of domicile. Experiential variables (E) include knowing an HIV-positive person, knowing someone who died from HIV/AIDS, knowing where to obtain ARVs, knowing someone on ARVs, and having previously had an STI.

The experiential variables align closely with the HBM, particularly its constructs of perceived susceptibility and perceived severity. These personal experiences may heighten an individual's perception of HIV risk or the seriousness of the disease, thereby increasing the likelihood of engaging in preventive behaviour. In addition,

knowing where to access ARV medication may serve as a cue to action, one of the core constructs in the HBM that triggers health-related behaviour.

Behavioural variables (B) include risky sexual behaviour, sex-related substance use, alcohol and drug abuse. Such variables can be interpreted through the lens of both models. In the HBM, such behaviours may reflect perceived barriers to condom use - for instance, if substance use reduces an individual's capacity to use condoms consistently. In the RAA, these behaviours function as background factors that influence key proximal determinants such as perceived behavioural control and behavioural intention. Substance use, for example, may diminish the perceived or actual ability to negotiate or use condoms during sexual encounters, thereby weakening intention and follow-through. Cognitive variables (C) include control over condom use, positive attitude toward condom use, perceived norm, perceived threat of HIV infection, HIV/AIDS knowledge, and depressive symptoms. Cognitive variables map most directly onto the core constructs of both models. For example, HIV/AIDS knowledge reflects a foundational understanding that informs both perceived threat (HBM) and attitudes toward the behaviour (RAA). Perceived control over condom use represents self-efficacy in the HBM and perceived behavioural control in the RAA - both crucial predictors of behaviour and intention. Similarly, positive attitudes toward condom use and perceived social norms are central to the RAA, influencing intention through affective and normative beliefs. Higher scale scores indicated greater levels of each construct. The dimensionality, validity, and reliability of these scales have been well established (Yakubu *et al.,* 2025).

ANALYSIS AND RESULTS

Analysis

First, the full dataset was examined for anomalies. Multiple linear regression examined demographic, experiential, behavioural, and cognitive factors predicting condom use frequency and future intentions, with models compared for variance explained and predictor differences across measures. Binomial logistic regression then evaluated predictors' impact on condom use at last sex with a female sex worker, considering all variables while addressing correlations.

Results

No outliers were found, but 24 participants (9.56%) had missing dependent variable data. Using listwise deletion, the sample size was reduced from 251 to 227.

Participants were males aged 18-60 (M=35; Md=33). Seventy-four percent were Black African, and 45% were married or in long-term relationships. Nearly 22% had primary education or less, while 72% had at least some secondary education. Fifty-eight percent were casual/contract workers, and 47% lived in the Western Cape.

Forty-five percent knew someone with HIV, 54% knew someone who died from HIV/AIDS, 63% knew where to obtain ARVs, and 39% knew someone on ARVs. Fifteen percent had a prior STI diagnosis.

Regression analysis of condom use with a FSW in terms of frequency of condom use over the last 3 months and intentions of condom use at next sex with a FSW (Models 1 and 2)

Preliminary analyses found no violations of normality, linearity, multicollinearity, or heteroscedasticity. Model 1 examined factors influencing condom use frequency with a sex worker in the past 3 months (see Table 1).

Table 1: Multiple linear regression of frequency of condom use over the last 3 months and intention to use a condom at next sex with FSWs on characteristics of construction MCSWs (n=227)

Variables	Model 1 Frequency of condom use with FSWs over last 3 months	Model 2 Condom use intention at next sex with FSW
Demographic:		
Relationship status (D1)	.210	.114
Age (D2)	.003	.014
Education (D3)	-.180	-.043
Work status (D4)	-.029	-.160
Province domiciled (D5)	-.092	-.048
Experiential:		
Know someone with HIV (E1)	-.003	.076
Know someone who died from HIV/AIDS (E2)	.277	.265
Know where you can get ARV medication (E3)	-.209	-.265
Know someone on ARV medication (E4)	.207	.101
Previously had an STI (E5)	-.063	-.150
Behavioural:		
Risk sexual behaviour (sexual encounters) (B1)	.050*	.038
Risk sexual behaviour (substance use during sex) (B2)	.009	.022
Alcohol consumption (AUDIT) (B3)	-.019	-006
Drug consumption (DUDIT) (B4)	.062	.106**
Cognitive:		
Presence of depressive symptoms (C1)	-.017	-.020
HIV/AIDS knowledge (C2)	.184*	.298***
Control over condom use (C3)	.104***	.122***
Perceived threat of HIV infection (C4)	.036	.001
Positive attitude toward condom use (C5)	.049	.069*
Perceived norm (C6)	.002	-.009
Constant	-.387	-1.123
R2	.289	.393
Δ R2	.289	.393
F	4.046***	6.431***
Δ F	4.046***	6.431***

The model was significant, $F(20, 199) = 4.046$, $p < 0.001$, explaining 28.9% of the variance. Significant predictors included risky sexual behaviour ($\beta = .050$, $p < 0.05$), HIV/AIDS knowledge ($\beta = .184$, $p < 0.05$), and control over condom use ($\beta = .104$, $p < 0.001$). Model 2 assessed determinants of intention to use a condom at next sex

with a sex worker (see Table 1). The model was significant, F (20, 199) = 6.431, $p < 0.001$, explaining 39.3% of the variance. Significant predictors included drug consumption ($\beta = .106$, $p < 0.010$), HIV/AIDS knowledge ($\beta = .298$, $p < 0.001$), control over condom use ($\beta = .122$, $p < 0.001$), and a positive attitude toward condoms ($\beta = .069$, $p < 0.05$).

Binomial logistic regression analysis of the relationship between use of a condom at last sex with a FSW and the demographic, experiential, behavioural, and cognitive variables (Model 3)

The Likelihood Ratio Test evaluates the overall relationship between an independent variable and the dependent variable, providing an indication of the unique contribution of each independent variable to the prediction of condom use at last sex with a sex worker. In Model 3 (not depicted here), a statistically significant unique contribution was made by risky sexual behaviour (sexual encounters) ($\chi 2 = 4.339$, $p<0.05$ with df = 1). Notably, none of the other variables made significantly unique contributions. The odds ratio (OR=1.081; 95% CI=1.003, 1.165) indicates that workers engaging in higher levels of risky sexual behaviour (sexual encounters) are 1.08 times more likely than their counterparts to have used a condom at last sex with an FSW. All three condom use models were statistically significant (*p< .05; **p< .01; ***p< .001).

DISCUSSION

The assessment of condom use among MCSW in the construction industry enhances our understanding of condom use by demonstrating the efficacy of using three distinct, but related measures - HCU, PCU, and FCU. It is important to note that risky sex behaviour was the only variable determined to be statistically significant across all three measures. Consequently, our findings complement the HBM, which implicitly includes risk as part of its framework through the constructs of perceived susceptibility and perceived severity (Carpenter, 2010). Perceived susceptibility refers to an individual's belief about the likelihood of experiencing a health issue or condition. In the context of condom use, this would translate to the person's assessment of their risk of contracting STIs including HIV.

Relatedly, perceived severity considers how serious an individual believes a health condition or its consequences to be. For condom use, it involves understanding the potential severity of contracting these infections and the impact they could have on one's life, health, and well-being. A study conducted in SA among young adults demonstrated that higher levels of HIV knowledge were directly linked to increased condom use. This was particularly evident when comparing different regions, suggesting that effective HIV education could counteract geographical and socio-demographic disparities in health behaviours (Shamu *et al.,* 2020). The predictive relationship between HIV/AIDS knowledge and increased condom use found in our study aligns with prior research suggesting that increased HIV knowledge can lead to more protective behaviours (Faust and Yaya, 2018). Our findings also lend empirical support to the RAA, which posits that attitudes toward a behaviour and perceived control over a behaviour significantly influences behavioural intentions. The fact that control over condom use and positive attitudes towards condoms were significant predictors of FCU aligns with this theoretical framework, highlighting the role of cognitive and experiential factors in shaping health behaviours.

Cross-sectional surveys, like the one conducted in this study, are essential tools in behavioural research as they describe data and inform longitudinal and experimental designs. However, they typically lack temporal depth and control over confounding

variables, making them less effective for causal inference. To address these limitations and enhance the robustness of our findings, this study employed three distinct self-reported measures of condom use, each serving to capture different facets of the behaviour. Using these three measures collectively addresses the critical gap left by the inherent limitations of cross-sectional designs. It allows for comprehensive data collection, enhancing the depth and breadth of understanding condom use behaviours. The multiple measures enable cross-verification and validation of the data, where consistencies strengthen the reliability of the findings, and discrepancies provide a basis for further inquiry. This approach also reduces measurement bias by diluting the impact of biases specific to any single measurement method.

Furthermore, the diversity in measures increases analytical flexibility, allowing for complex statistical analyses that explore correlations and predict behaviours based on a variety of inputs. This multiplicity not only supports different research questions within the same study framework but also improves the external validity of the findings. The results are thus potentially more generalisable and can inform more effective health promotion strategies.

CONCLUSIONS AND RECOMMENDATIONS

Importantly, the results align with core constructs of the HBM and the RAA: HIV/AIDS knowledge, perceived control over condom use, and positive attitudes toward condoms were consistent predictors of both actual condom use and behavioural intention. These findings underscore the role of perceived threat, self-efficacy, and motivational factors in shaping sexual health behaviour and affirm the relevance of theory-informed public health interventions. Future research can usefully test these associations in larger, more representative samples to enhance generalisability and support the development of targeted prevention strategies.

In terms of actionable insights for public health practitioners designing workplace-based or mobile interventions, the following recommendations are offered:

a) Incorporate prospective behavioural measures into intervention planning: Programs should go beyond assessing past behaviour and integrate indicators such as intention to use condoms to better predict future risk and tailor interventions accordingly. This is particularly relevant in the context of informal employment and high internal mobility that characterise the construction industry.

b) Design behaviour change content that targets key psychosocial drivers: Given the strong predictive value of condom use self-efficacy, positive attitudes toward condoms, and HIV/AIDS knowledge, interventions should include components that build confidence, challenge misconceptions, and reshape norms around condom use through culturally resonant and gender-sensitive strategies.

c) Leverage risk awareness in communication strategies: The observed association between higher levels of risky sexual behaviour and more frequent condom use may indicate that some men are responding to risk with protective behaviours. Messaging should acknowledge and reinforce this adaptive response; framing condom use as an act of responsibility and self-protection rather than simply a risk-avoidance measure.

These recommendations highlight the importance of aligning intervention strategies with both the lived realities of MCSW and the theoretical frameworks that best explain their behaviour, thus enhancing both program design and implementation impact.

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