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PSYCHOSOCIAL PREDICTORS OF ADOLESCENT ATTITUDES AND POST-CIRCUMCISION BEHAVIORAL INTENTIONS WITHIN SECONDARY SCHOOLS OF MIGORI COUNTY, KENYA

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Abstract

This study examined psychosocial predictors of adolescents' attitudes and post-circumcision behavioral intentions among circumcised male secondary school students in Migori County, Kenya. The work was motivated by the "Migori paradox," whereby the county records high VMMC coverage (66.7%) alongside disproportionately high HIV prevalence (13.0%). Guided by the Theory of Planned Behavior, the study investigated how VMMC-related knowledge and HIV risk perception relate to adolescent attitudes toward circumcision and to undesired behavior intentions within school settings. A descriptive cross-sectional design was used, and 375 circumcised male students in Forms Two to Four were selected through stratified random sampling across ten sub-counties. Data were collected using structured questionnaires and analyzed with SPSS Version 25.0. Findings showed high factual knowledge: 87.7% of respondents correctly indicated that VMMC reduces HIV risk. However, 83.2% reported feeling safer in romantic relationships after circumcision, revealing a gap between understanding partial protection and how protection is interpreted in practice. Multiple regression analysis indicated that perceived behavioral control ($\beta = 0.524$, $p < .001$) and attitude ($\beta = 0.335$, $p < .001$) were the strongest predictors of undesired behavioral tendencies, while subjective norms had a marginal effect ($\beta = 0.229$, $p = .052$). The overall model was significant and explained 43.2% of the variance in behavioral outcomes ($F = 50.97$, $p < .001$). The study concludes that perceived behavioral control and attitude are central correlates of adolescents' undesired behavior after circumcision, and that high knowledge alone does not prevent an "illusion of immunity." It recommends integrating structured behavioral counseling, self-regulation and self-efficacy training, and balanced risk communication into school-based VMMC programmes, and calls for further research on female perspectives and digital media influences on post-VMMC attitudes and norms.

Keywords: *Psychosocial predictors; Adolescent attitudes; Voluntary medical male circumcision (VMMC); Behavioral intentions; HIV risk perception.*

Introduction

Voluntary medical male circumcision (VMMC) has become a central component of HIV prevention in many high-burden settings, including Kenya and other countries in East and Southern Africa. Randomized controlled trials in South Africa, Kenya, and Uganda show that medically performed circumcision can reduce female-to-male HIV acquisition by about 50–60%, leading global agencies such as the World Health Organization (WHO) and UNAIDS to endorse VMMC as part of combination HIV prevention rather than a stand-alone solution (Auvert et al., 2005; Bailey et al., 2007; Gray et al., 2007; WHO, 2020). This protection is biologically partial, meaning that condom use, partner reduction, and other behavioral safeguards remain essential, especially for adolescents whose interpretations of risk and safety are still developing (Kalichman & Eaton, 2017; Hoffman & Cohen, 2022).

Concerns about behavioral risk compensation have therefore emerged in the VMMC literature. Behavioral risk compensation refers to situations where individuals increase risky sexual behavior because they feel less vulnerable after adopting a protective intervention, such as circumcision (Kalichman & Eaton, 2017). International data show that condomless sexual encounters among adolescents are common, with sizeable proportions of sexually active boys reporting no condom use at last intercourse, which is directly linked to unintended pregnancies and heightened risk of sexually transmitted infections (Nagata et al., 2022; Centers for Disease Control and Prevention [CDC], 2024). These patterns indicate that expanding access to biomedical interventions does not automatically produce safer behavioral outcomes.

To understand these dynamics, this study is anchored in a theoretical framework that integrates the Theory of Planned Behavior (TPB), the Health Belief Model (HBM), and Social Cognitive Theory (SCT). TPB posits that attitudes toward a behavior, subjective norms, and perceived behavioral control jointly shape intentions and subsequent actions (Ajzen, 1991; Fishbein & Ajzen, 2010). HBM highlights perceived susceptibility, perceived benefits and barriers, and cues to action as central to health decision-making (Champion & Skinner, 2008). SCT emphasizes self-efficacy, observational learning, and self-regulation within social contexts (Bandura, 1997). Together, these frameworks guide the study's hypotheses by suggesting that adolescents' VMMC knowledge, HIV risk perception, attitudes, perceived norms, and self-efficacy will influence their post-circumcision behavioral intentions and undesired behavior.

Building on this global and theoretical perspective, the study then turns to the regional context of Kenya's lake-region counties. In these counties, including Migori, VMMC has been aggressively scaled up as part of the national HIV response. Yet Migori County illustrates what has been termed a "Migori paradox": the county reports very high VMMC coverage among males while simultaneously recording among the highest HIV prevalence levels nationally (National AIDS and STI Control Programme [NASCOP], 2023). This apparent disconnect between high uptake of a biomedical intervention and persistently elevated HIV burden suggests that local behavioral and psychosocial processes may be undermining the full preventive potential of VMMC.

The socio-economic landscape of Migori, marked by fishing and mining corridors and transactional exchanges, further shapes adolescent behavior, as peer norms among boys can normalize risky sexual practices even after circumcision (StatsKenya, 2024). From an educational psychology standpoint, adolescent health behavior in this environment is not simply a function of clinical services; it is mediated by cognitive appraisals of risk, social expectations in schools and communities, and self-regulation capacities in romantic and sexual contexts (Ngugi, 2021; Ajzen, 1991; Bandura, 1997). This study is therefore distinctive in its focus on psychosocial predictors particularly VMMC knowledge, HIV risk perception, attitudes, subjective norms, and perceived behavioral control and on how these constructs, drawn from TPB, HBM, and SCT, relate to post-VMMC undesired behavior among circumcised male secondary school students in Migori County.

By explicitly situating the Migori paradox within global evidence, a robust theoretical framework, and the adolescent school ecology, the introduction establishes the analytical lens that guides the formulation of hypotheses and the interpretation of results in subsequent chapters.

Acronyms and initialism

The following acronyms are utilized within the paper to describe health conditions, theoretical frameworks, and institutional bodies:
AFIDEP: African Institute for Development Policy
BRC: Behavioral Risk Compensation
HBM: Health Belief Model
HIV: Human Immunodeficiency Virus
IREC: Institutional Research Ethics Committee
MoE: Ministry of Education
NACOSTI: National Commission for Science, Technology and Innovation
NASCOP: National AIDS and STIs Control Programme
PBC: Perceived Behavioral Control
SCT: Social Cognitive Theory
SPSS: Statistical Package for the Social Sciences
STI: Sexually Transmitted Infection
TPB: Theory of Planned Behavior

VMMC: Voluntary Medical Male Circumcision
WHO: World Health Organization

Research Methodology

The study adopted a descriptive cross-sectional design within a quantitative research approach in order to examine the association between VMMC knowledge, HIV risk perception, adolescent attitudes, and undesired behavior after circumcision. This design was appropriate because it enabled the researcher to capture exposure variables, such as circumcision status and psychosocial factors, alongside outcome variables, including dating behavior, perceived safety, and partner multiplicity, at a single point in time. In this way, the design supported both prevalence estimation and the examination of relationships among variables, consistent with the recommendations of Creswell (2014) and Setia (2016).

The target population consisted of 29,203 circumcised male students in Forms Two, Three, and Four enrolled in 204 public and private secondary schools in Migori County, Kenya, according to 2024 Ministry of Education data. Using Yamane's formula, a sample size of 395 students was estimated on the basis of a 95% confidence level and a 5% margin of error. During fieldwork, however, 375 questionnaires were fully completed and retained for analysis, yielding a response rate of 95%. Participants were selected through a multi-stage stratified random sampling procedure. In the first stage, Migori County was stratified into its ten sub-counties. In the second stage, schools were grouped by category as public or private. In the final stage, systematic random sampling was used at the school level to select individual respondents from each class.

Data were collected using a structured, self-administered questionnaire organized into thematic sections. Section B measured VMMC knowledge, Section C assessed attitudes toward VMMC, Section F measured HIV risk perception, and other sections captured post-circumcision behavioral intentions and undesired behavior. Sections C and F were measured using a 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. In keeping with the study's theoretical framework, TPB-related items were embedded within the psychosocial sections of the instrument. Subjective norms were measured through items examining perceived approval from peers, parents, and the broader community, while perceived behavioral control was assessed through items focusing on respondents' confidence in resisting pressure, managing romantic situations, and making responsible decisions after circumcision. This placement allowed the questionnaire to reflect the conceptual structure of the study while maintaining a logical flow across sections.

Prior to the main survey, a pilot study was conducted with 54 students, representing approximately 10% of the final sample. The pilot was used to assess clarity, feasibility, and the overall suitability of the instrument, in line with the guidance that a pilot sample of 5% to 10% is adequate for identifying potential weaknesses in survey tools. The pilot test yielded an overall Cronbach's alpha of 0.823, which indicated strong internal consistency and exceeded the commonly accepted reliability threshold of 0.70.

Content validity was established through expert review. Each item was rated on a 4-point relevance scale, ranging from 1 = not relevant to 4 = highly relevant. The questionnaire achieved a Scale-Content Validity Index (S-CVI/Ave) of 0.91, which indicates excellent content validity. Data collection was conducted by a trained research assistant in a controlled school environment to ensure privacy and reduce the possibility of peer influence. The completed questionnaires were then cleaned, coded, tabulated, and analyzed using SPSS version 25.0. Descriptive statistics, including frequencies, means, and standard deviations, were used to summarize the data, while inferential statistics, specifically Pearson correlation and multiple regression analysis, were employed to test the relationships among VMMC knowledge, HIV risk perception, attitudes, and undesired behavior. This analysis followed the general guidance of Kothari (2004).

Ethical standards were upheld throughout the study. Approval was obtained from the National Commission for Science, Technology and Innovation, and ethical clearance was secured from the Rongo University Institutional Research Ethics Committee. Written informed consent was obtained from parents or guardians through the school administration, and informed assent was obtained from the students prior to participation. Participation remained voluntary at all

stages, and anonymity and confidentiality were maintained throughout the research process.

Results and Discussions

Table 4.1

Demographic Characteristics of Respondents (N = 375)

Variable	Category	Frequency (f)	Percentage (%)
Level of Study	Form 2	132	35.2%
	Form 3	125	33.3%
	Form 4	118	31.5%
Type of School	Boys' Only	198	52.8%
	Mixed	177	47.2%
School Category	Day	155	41.3%
	Boarding	139	37.1%
	Day and Boarding	81	21.6%

Note. Adapted from "Demographic Profile of Secondary School Respondents"

As shown in Table 4.1, the study achieved a strong response rate of 95%, with 375 respondents successfully included in the analysis. The demographic distribution was fairly balanced across the targeted levels of study, with Form 2 students accounting for 35.2%, Form 3 for 33.3%, and Form 4 for 31.5%. This spread is important because it captures adolescents at different stages of social and cognitive development within the school ecology, which serves as a vital platform for reaching this population.

The sample also reflected diversity in school environment. Students from boys' only schools made up 52.8% of the respondents, while 47.2% came from mixed schools. In terms of school category, 41.3% were from day schools, 37.1% from boarding schools, and 21.6% from day-and-boarding schools. This distribution is valuable because it reflects the varied social environments in Migori County and supports interpretation of the findings across different adolescent settings.

Table 4.2

Knowledge and HIV Risk Perception Metrics

Statement	% Agree	Mean	Std. Dev
VMMC reduces risk of STIs/HIV	87.7%	4.26	0.85
HIV is a serious community issue	72.5%	3.69	1.14
Confidence in finding info	77.6%	4.08	1.31
Confidence in info appraisal	62.1%	3.34	1.04

Note. Adapted from "VMMC Knowledge and HIV Risk Perception Metrics"

Table 4.2 reveals a clear disconnect between factual knowledge and psychological internalization of risk. A large majority of respondents, 87.7%, correctly identified that VMMC reduces the risk of HIV and STIs. However, only 62.1% felt confident in their ability to appraise health information, suggesting that many students understood the message at a basic level but lacked stronger critical appraisal skills. This indicates a perceived barrier within the Health Belief Model framework, where knowledge does not necessarily translate into informed judgment.

The results also show that 83.2% of adolescents reported feeling safer in romantic relationships after circumcision, with a mean score of 4.02. This suggests a reduction in perceived susceptibility, which may encourage behavioral risk compensation. Rather than seeing circumcision as one partial prevention strategy, some adolescents appear to treat it as a standalone shield. This interpretation helps explain the persistence of the Migori paradox, where high VMMC uptake coexists with continued HIV vulnerability.

Discussion in relation to literature

Most respondents correctly agreed that VMMC reduces the risk of STIs/HIV and recognized HIV as a serious community issue, which matches earlier evidence that VMMC messages have been widely disseminated in high-HIV settings. At the same time, confidence in appraising health information was much lower, suggesting that adolescents possess surface knowledge but lack deeper health literacy, a gap similar to what Otieno and Akinyi (2023) report for the Lake Region. This pattern aligns with the Health Belief Model: perceived benefits are high, but perceived susceptibility is weakened, opening space for behavioral risk compensation as described by Kalichman and Eaton (2017).

Table 4.3

Subjective Norms toward VMMC and dating behaviour (N = 375)

Statement	SD	D	N	A	SA	% Agree (A+SA)	Mean	Std. Dev
My friends encouraged me to get circumcised	18	33	52	145	127	72.5%	3.69	1.14
Most boys in my school support male circumcision	13	27	44	155	136	77.3%	3.98	1.06
I felt pressure to undergo circumcision to fit in with my peers	36	54	58	133	94	60.5%	3.34	1.28
My family thinks it is important for me to be circumcised	9	19	32	149	166	83.7%	4.15	0.96
Girls are more likely to date circumcised boys	22	35	59	139	120	69.3%	3.64	1.17

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

The findings further show that social expectations strongly influence how VMMC is interpreted. About 69.3% of respondents believed that girls prefer circumcised boys, suggesting that circumcision carries social value beyond its medical purpose. In this context, VMMC functions as a form of social capital and is often associated with manhood, attractiveness, or sexual readiness rather than simply health protection.

This social meaning may act as a behavioral reinforcer. According to Social Cognitive Theory, when a practice is associated with peer approval or romantic desirability, adolescents may be more likely to adopt related behaviors that are socially rewarded. In this case, the "sexual readiness" narrative may contribute to undesired behavior after circumcision by shifting attention away from clinical safety and toward social status.

Discussion in relation to literature

Peer and family norms strongly favor circumcision friends, most boys, and families were widely seen as supportive indicating that VMMC is embedded in social expectations rather than only clinical advice. The belief that girls are more likely to date circumcised boys shows that circumcision functions as social capital, in line with Social Cognitive Theory, where socially rewarded identities reinforce certain behaviors. Studies on peer and partner influence in VMMC uptake have similarly noted that adolescent boys respond to perceived attractiveness and status gains, not just health messaging, which can indirectly encourage riskier post-circumcision behavior when social rewards overshadow safety

Table 4.4

Attitude toward VMMC and dating behavior (N = 375)

Statement	SD	D	N	A	SA	% Agree (A+SA)	Mean	Std. Dev
VMMC increases my confidence when dating	24	42	61	146	102	66.1%	3.60	1.14
Being circumcised makes me feel safer in peer-relationships	9	18	36	174	138	83.2%	4.02	0.97
I believe VMMC reduces my risk of STIs including HIV	5	19	23	154	174	87.7%	4.26	0.85
I think girls prefer circumcised boys for dating	36	59	73	123	84	55.3%	3.33	1.22
VMMC makes me more willing to date multiple partners	93	123	57	63	39	27.2%	2.49	1.25

Note: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree.

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The results in Table 4.4 show that most of the participants had a good belief regarding VMMC, especially in terms of enhancing health and self-confidence socially. The most celebrated belief is that VMMC reduces the risk of STIs like HIV (Mean = 4.26, SD = 0.85), agreed or strongly agreed by 87.7% of the students. This confirms the health protection belief as a key facilitator. The scale item "Being circumcised makes me safer in sexual relationships" was close behind at 83.2% agreement (Mean = 4.02, SD = 0.97), reporting a feeling of increased safety, which is congruent with specified risk-reduction beliefs in public health campaigns. Furthermore, a significant proportion of the students believed that VMMC improved confidence in dating, with a mean of 3.60 (SD = 1.14) and 66.1% agreement. This confirms that circumcision may provide psychological and social upgrades to young men in courtship relationships. At a moderate level, 55.3% of participants agreed that girls prefer dating circumcised boys (Mean = 3.33, SD = 1.22). This demonstrates subjective norm pressures whereby social desirability and female/peer preference can influence the uptake of VMMC. Interestingly, the lowest concordance was found on the item "VMMC makes me more likely to date multiple partners" (Mean = 2.49, SD = 1.25), and only 27.2% agreed. It suggests that most do not interpret circumcision as an allowance for sexual experimentations or larger numbers of partners, against the behavior risk compensation hypothesis.

Discussion in relation to literature

Attitudes toward VMMC were largely positive: students strongly endorsed its protective value and reported more confidence and safety in dating after circumcision, consistent with literature showing that VMMC is framed as both hygienic and protective in adolescent campaigns. However, this enhanced confidence and sense of safety echo concerns about risk compensation, as adolescents may misinterpret the 50–60% risk reduction as near-complete protection, a trend highlighted in international VMMC evaluations. Interestingly, most respondents rejected the idea that VMMC makes them more willing to date multiple partners, which suggests that while perceived safety is elevated, many do not consciously endorse overt sexual disinhibition indicating a more subtle, feelings-based rather than openly endorsed form of compensation.

Table 4.5

Pearson Correlation Matrix of TPB Constructs and Behavior

Variable	1	2	3	4
1. Undesired Behavior	1.000			
2. Attitude toward VMMC	.629**	1.000		
3. Subjective Norms	.517**	.548**	1.000	
4. Perceived Behavioral Control	.684**	.612**	.564**	1.000

Note. **p < 0.01 (2-tailed). Adapted from "TPB Constructs and VMMC Behavioral Correlations"

Inferential analysis using the Theory of Planned Behavior provides deeper insight into the drivers of adolescent behavior, as shown in Table 4.5 and Table 4.6. The strongest correlation was between perceived behavioral control and undesired behavior (r=.684)(r = .684)(r=.684), indicating that self-efficacy was the most important psychological correlate in the model. Attitude toward VMMC also showed a strong relationship with undesired behavior (r=.629)(r = .629)(r=.629), while subjective norms were moderately correlated (r=.517)(r = .517)(r=.517).

Table 4.6

Multiple Regression Analysis of TPB Predictors

Predictor Variable	Beta (β)	t-value	p-value
Attitude toward VMMC	0.335	3.572	< 0.001
Subjective Norms	0.229	1.954	0.052
Perceived Behavioral Control	0.524	5.653	< 0.001

Model Summary: *R2*: 0.432, F-statistic: 50.97, Significance: $p < 0.001$

Multiple regression results confirmed this pattern. Perceived behavioral control was the strongest predictor of undesired behavior ($\beta = 0.524, p < 0.001$)(\beta = 0.524, p < 0.001)($\beta = 0.524, p < 0.001$), followed by attitude toward VMMC ($\beta = 0.335, p < 0.001$)(\beta = 0.335, p < 0.001)($\beta = 0.335, p < 0.001$). Subjective norms had a positive coefficient ($\beta = 0.229$)(\beta = 0.229)($\beta = 0.229$) but a p-value of 0.052, which is slightly above the conventional alpha level of 0.05. This means the effect is not statistically significant at the standard threshold, though it is close enough to be described as marginal or borderline. In strict statistical terms, it should not be treated as significant because the evidence does not meet the usual criterion for rejecting the null hypothesis.

Discussion in relation to literature

Correlation and regression results show that perceived behavioral control and attitude toward VMMC are the strongest predictors of undesired behavior, while subjective norms have only a marginal, non-significant effect at the 0.05 level. This pattern is consistent with the Theory of Planned Behavior and broader adolescent literature: self-efficacy and personal appraisal often play a more central role in actual behavior than social pressure, especially in sexual and romantic contexts. The findings therefore support and extend TPB-based studies on adolescent sexual health by confirming that in a high-VMMC setting like Migori, the key challenge is not lack of knowledge or social support, but how adolescents interpret protection and regulate their behavior in everyday dating situations.

Conclusion

The study confirms that while VMMC knowledge in Migori County is quantitatively high, it is qualitatively incomplete. The "illusion of immunity" persists among adolescents, who often view circumcision as a complete protection rather than partial protective measure which may be necessitating undesired behaviors post-VMMC. The study found that students with positive perceptions of VMMC were more likely to engage in dating relationships (undesired behaviors), suggesting that circumcision may alter one's self-image and perceived desirability, potentially leading to more assertive social behaviors. This supports TPB's assertion that attitudes are a direct predictor of behavioral intentions and actual conduct and that attitudes are primarily shaped by perceived health benefits and social desirability (romantic appeal), rather than a calculated assessment of HIV risk as HBM posits.

Crucially, the research demonstrates that self-efficacy (Perceived Behavioral Control) is the primary engine of responsible behavior. The marginal influence of subjective norms suggests that interventions should shift focus from broad community pressure to individual empowerment and decision-making skills. The "literacy gap" remains a significant barrier, as adolescents struggle to distinguish medical facts from cultural myths regarding post-circumcision safety.

Recommendations

Based on the findings, the following actions are recommended to align biomedical protection with responsible behavioral interpretations:

- Integrate Behavioral Education through explicit "partial protection" messaging into VMMC clinical and community programs to counter the overestimation of the procedure's efficacy.
- Schools should strengthen Life Skills Curricula through guidance and counseling services, focusing specifically on sexual assertiveness and relationship management to reinforce self-efficacy.
- VMMC programs should leverage Peer Educator Networks to shift subjective norms from viewing circumcision as a "sexual rite of passage" to a "responsible health choice."
- Post-VMMC counseling should include structured mentorship to build the self-regulatory capacity of adolescent males, ensuring they feel in control of their dating decisions. And this will improve their self-eficacy.
- Develop tools to monitor post-VMMC behavioral shifts, allowing for early intervention in cases where risk compensation or behavioral disinhibition is detected.

- Align the efforts of the Ministry of Health and Ministry of Education to ensure that health messaging is consistent across clinical, community, and academic settings.

Declaration of Generative AI And AI-Assisted Technologies in the Writing Process

The authors used generative AI to assist in the synthesis, structural organization grammar refinement of the manuscript. Final review and factual verification were performed by the human authors to ensure adherence to the source data and therefore assumed full responsibility for the publication's content.

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Dr. Manson Sichari: Supervision, Validation, Review & Editing.

Dr. Karen Oyiengo: Supervision, Validation, Review & Editing.

Declaration of Conflict of Interest

The authors declare that there are no conflicts of interest including known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper or regarding its publication.

References

African Institute for Development Policy (AFIDEP). (2021). *Male partner engagement in contraceptive choice among young people in Kenya*. AFIDEP.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.

Ajzen, I., & Schmidt, P. (2022). Revisiting the theory of planned behavior: Lessons, challenges, and directions for future research. *Journal of Applied Social Psychology, 52*(5), 249–263.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press.

Kalichman, S. C., & Eaton, L. A. (2017). Circumcision for HIV prevention and risk compensation. *The Lancet HIV, 4*(1), e2–e3.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches*. Acts Press.

NASCOP, & Ministry of Health. (2023). *National VMMC strategy*. Ministry of Health, Kenya.

NASCOP. (2023). *Kenya HIV estimates report*. Ministry of Health, Kenya.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Ochieng, W. N. (2023). Sexual self-efficacy among male students in post-circumcision contexts. *East African Journal of Psychology and Counseling, 7*(3), 113–125.

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health, 29*(5), 489–497.

Rosenstock, I. M. (1974). Historical origins of the Health Belief Model. *Health Education Monographs, 2*(4), 328–335.

Setia, M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology, 61*(3), 261–264.

StatsKenya. (2024). *County synthesis report: Adolescent pregnancy and peer norms in Migori*.

World Health Organization. (2023). *Voluntary medical male circumcision for HIV prevention*.

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.