

**SEXUAL VIOLENCE RISKS ASSOCIATED WITH SHARED
SANITATION FACILITIES IN INFORMAL SETTLEMENTS, NAIROBI CITY
COUNTY, KENYA**

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This research is my original work and has not been presented in any other university/institution for a degree or for consideration of any certification.

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DEDICATION

To my family and friends for believing in me and supporting me through the entire time of writing this thesis.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
ABBREVIATIONS AND ACRONYMS	xi
DEFINITION OF OPERATIONAL TERMS	xii
ABSTRACT	xiv
CHAPTER ONE: INTRODUCTION.....	1
1.1 Background of the study.....	1
1.2 Problem statement	3
1.3 Justification of the study.....	7
1.4 Research questions	7
1.5 Objectives	8
1.5.1 Broad objective	8
1.5.2 Specific objectives	8
1.6 Significance of the study	8
1.7 Study limitations and delimitations	9
1.7.1 Delimitations	9
1.7.2 Limitations	10
1.8 Theoretical framework	12
1.9 Conceptual framework	13
CHAPTER TWO: LITERATURE REVIEW	15
2.1 Introduction	15
2.2 Prevalence of sanitation-related sexual violence.....	15
2.3 Perceptions associated with sexual violence in relations to shared sanitation	21
2.4 Sanitation factors	26

2.4.1 Research Scarcity of sanitation facilities and increased sexual violence risk	26
2.4.2 Socio-economic barriers to safe sanitation	27
2.4.3 Impact of inadequate lighting and gender segregation on safety	28
2.4.4 Geographical barriers to safe sanitation access.....	28
2.4.5 Gendered risks and privacy concerns in shared facilities	29
2.4.6 Standards for safe and accessible sanitation	29
2.4.7 Psychosocial impact of sanitation-related violence	30
CHAPTER THREE: MATERIALS AND METHODS.....	31
3.1 Introduction	31
3.2 Study design	31
3.3 Study Variables	32
3.4 Study area	32
3.5 Study location.....	32
3.6 Target population.....	33
3.7 Eligibility of participants	33
3.8 Sampling procedures	34
3.8.1 Sampling technique.....	34
3.8.2 Sample size determination	35
3.9 Establishing validity and reliability in data collection instruments.....	36
3.9.1 Validity.....	36
3.9.2 Reliability.....	38
3.9.3 Pilot testing of tools	38
3.10 Logistical and ethical considerations.....	40
3.11 Data collection and analysis	40
3.11.1 Data collection techniques	40
3.11.2 Data analysis	43
CHAPTER FOUR: RESULTS.....	45
4.1 Introduction	45
4.1.1 Socio-demographic characteristics	45

4.1.1.1 Prevalence of sanitation-related sexual violence	47
4.1.1.2 Co-occurrences of sanitation-related sexual violence and other forms of non-sexual violence.....	48
4.1.1.3 Socio-demographic factors associated with sanitation-related sexual violence	49
4.1.1.4 Perpetrators of sexual violence	52
4.1.2 Perceptions of sexual violence associated with sanitation facilities	53
4.1.2.1 Dealing with the occurrence of sexual violence	53
4.1.2.2 Reporting of sexual violence	54
4.1.2.3 Challenging the behavior of sanitation-related sexual violence	56
4.1.2.4 Questioning the perpetrator's behavior	57
4.1.2.5 Attitude toward sanitation-related sexual violence.....	58
4.1.2.6 Attitude toward safety within shared sanitation.....	59
4.1.3 Sanitation factors contributing to sanitation-related sexual violence	61
4.2 Qualitative narrative analysis	62
4.2.1 Prevalence of sanitation-related sexual violence	63
4.2.2 Perceptions of adult residents regarding sanitation-related sexual violence	63
4.2.3 Sanitation-related factors contributing to sexual violence.....	64
CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS	66
5.1 Introduction	66
5.2 Discussion.....	66
5.2.1 Prevalence of sanitation-related sexual violence	66
5.2.2 Perceptions of sexual violence	70
5.2.3 Sanitation factors that contribute to sanitation-related sexual violence	75
5.3 Conclusions	76

5.4 Recommendations	77
5.4.1 Recommendations from the study.....	77
5.4.2 Recommendations for further study.....	78
REFERENCES	79
APPENDICES.....	88
Appendix I : Map of Kenya showing Jua Kali informal settlement.....	88
Appendix II : Consent	89
Appendix III : Questionnaire guide.....	92
Appendix IV : Key informants interview guide.....	101
Appendix V : Focused Group Discussion Interview guide.....	102
Appendix VI : Focused group note-takers form.....	103
Appendix VII : Clearance from Kenyatta University.....	104
Appendix VIII : Research Authorization	105
Appendix IX : Research Permit from NACOSTI.....	106
Appendix X : Research permit from Nairobi County	107

LIST OF TABLES

Table 4.1 :	Demographic Information of participant from Jua Kali informal settlement.....	46
Table 4.2 :	Co-occurrences of Sanitation-Related Sexual Violence indicating the various forms of violence	49
Table 4.3 :	Socio-demographic factors associated with sanitation-related sexual violence.....	51
Table 4.4 :	Perpetrators of sexual violence and the relationship with the survivors	53
Table 4.5 :	Interventions by survivors during episodes of abuse	54
Table 4.6 :	Actions against perpetrators of sanitation-relate sexual violence in Jua Kali informal settlement	55
Table 4.7 :	Challenging the behavior of sanitation-related sexual violence.....	56
Table 4.8 :	Questioning the perpetrators behavior	57
Table 4.9 :	Regression on Attitude towards sanitation related sexual violence	59
Table 4.10 :	Regression on Attitude towards safety within shared sanitation.....	60
Table 4.11 :	Sanitation factors contributing to sanitation-related sexual violence.....	62

LIST OF FIGURES

Figure 1.1: Conceptual framework.....14

Figure 4.1: Magnitude of Sanitation-Related Sexual Violence in Jua Kali informal
settlement47

Figure 4.2: Prevalence of Sanitation-Related Sexual Violence by gender.....48

Figure 4.3: Percentage of survivors who reported sexual violence.....55

ABBREVIATIONS AND ACRONYMS

CHV	Community Health Volunteer
CPTED	Crime Prevention Through Environmental Design
FGD	Focused Group Discussion
FGM	Female Genital Mutilation
GBV	Gender Based Violence
HIV	Human Immuno-Deficiency Virus
KDHS	Kenya Demographic Health Survey
KII	Key Informant Interviews
KUERC	Kenyatta University Ethics and Review Committee
NACOSTI	National Commission for Science, Technology and Innovation
RAT	Routine Activity Theory
SDG	Sustainable Development Goals
SHARE	Sanitation and Hygiene Applied Research for Equity
SPSS	Statistical package for Social Sciences
STI	Sexually Transmitted Infection
UN	United Nations
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

Sexual violence	This refers to any sexual act, attempt to obtain a sexual act, or other act directed against a person's sexuality using coercion, by any person regardless of their relationship to the victim, in any setting. It includes rape, defined as the physically forced or otherwise coerced penetration of the vulva or anus with a penis, other body part or object, attempted rape, unwanted sexual touching and other non-contact forms (WHO,2021).
Sanitation	Sanitation is access to, and use of, excreta and wastewater facilities and services that ensure privacy and dignity, ensuring a clean and healthy living environment for all (UN Habitat).
Shared sanitation facilities:	These include facilities that are used as toilets, bathing blocks, or water points and are communally shared amongst the residents in an informal settlement (Heijnen et al., 2015).
Sanitation- related sexual violence	These are forms of sexual abuse that result from shared sanitation facilities in the community and do not necessarily mean penetrative sexual violence (Barchi & Winter, 2020).

Gender-Based Violence (GBV)	This is described as any intentional act of harm that is perpetrated against a person or a group of people, whether threatened or actual on the basis of their gender, perceived sexual orientation and/or gender identity that results or is likely to result in physical, sexual or psychological harm (UN Women, 2020).
WASH – Water, Sanitation and Hygiene	These are public health components at the community level that describe accessibility to potable and wholesome water, and safe and hygienic sanitation facilities including toilets and bathrooms.
Informal settlement	Areas that meet any one of five conditions: lack of clean water, lack of sanitation, nondurable construction, overcrowding, and insecure tenure. Also known as “slums” (UN Habitat, 2015).
Perception	These are the attitudes, beliefs, and awareness that residents hold regarding safety, risks, and reporting of sexual violence associated with shared sanitation facilities.

ABSTRACT

Sexual violence refers to acts of sexual abuse that include rape, sexual assault, unwanted touching, and sexual harassment that are committed against women and men without their consent. Understanding the context of sanitation-related sexual violence in countries that have inadequate sanitation infrastructure is significant because of the link between the shared sanitation facilities and the well-being of the people living in the informal settlements. Sanitation is a critical element in public health, and effectively considering gender while providing sustainable sanitation and hygiene services, may contribute to improved relationships and attitudes towards the vulnerable population in the community. There is a need for integrated and sustainable innovative strategies to respond to sanitation-related sexual violence. The study used a cross-sectional observational design to examine the sexual violence linked to shared sanitation facilities in the informal settlement of Jua Kali, in Nairobi County. The variables included sexual violence (dependent) and socio-demographic, sanitation-related, and perception factors (independent). A sample of 381 participants, drawn systematically from the population, provided quantitative data through self-administered questionnaires. Instrument validity and reliability were assured through expert review and a pilot test conducted in a neighboring settlement. For qualitative insights, key informant interviews and focus group discussions were conducted and analyzed thematically to identify recurring patterns and contextual factors associated with sexual violence. Data was processed using the Statistical Package for Social Sciences (SPSS) version 26.0, where cross-tabulations were used for analysis. Data was presented in graphical presentations for descriptive statistics. The emerging trends were presented in charts, graphs, and tables. A significant proportion of sanitation-related sexual violence was experienced by female respondents, with 90% of reported cases involving women, compared to 10% involving men. The majority of respondents who experienced sanitation-related sexual violence were Christians (78.4%), and were four times more likely to encounter such violence (OR = 3.641, 95% CI = 1.067-3.972, $p = 0.0001$). Most respondents, 67.2%, demonstrated willingness to question or challenge the perpetrator's behaviour, while 15.2% had already done so. The study revealed that respondents who were 30-39 years, 40-49 years, and males were three, two, and one and a half times, respectively more likely to question the behavior of perpetrators. The results indicated significant associations between a number of factors and sanitation-related sexual violence. These factors included long distances (greater than 50 meters) ($p=0.030$, $\chi^2=5.471$, $df 1$), shared sanitation facilities ($p=0.0001$, $\chi^2=43.747$, $df 1$), safety at water points ($p=0.0001$, $\chi^2=11.782$, $df 1$), lighting at sanitation facilities ($p=0.001$, $\chi^2=11.144$, $df 1$), and non-central sanitation facilities ($p=0.001$, $\chi^2=12.700$, $df 1$). Thus, it is important for the national and county governments, including the security agencies, to put in place preventive and prompt responses that address incidents of sexual violence related to shared sanitation in the informal settlements.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Sexual violence is a significant human rights violation and manifests widespread public health concerns. The World Health Organization (WHO) reports that one in three women of reproductive age worldwide has experienced sexual violence at some point in her life (WHO,2021). Boys and men also face violence while accessing water and sanitation, with local masculinity norms impeding their ability to avoid or report such incidents (Sommer, 2019).

Globally, approximately two billion people lack access to safe water, while 3.6 billion lack access to safely managed sanitation (WHO, 2021). UN-Habitat estimates that 51.3% of the urban population in sub-Saharan Africa (SSA) lived in slums in 2020, with future projections indicating continued growth (Li et al., 2023). Research conducted in India and South Africa shows that when sanitation facilities are situated far from people's homes, the residents face heightened risks of violence and attacks while walking alone to use them, especially at night (Hazare & Tholiya, 2023). In many contexts, a lack of access to, or poorly designed, water, sanitation, and hygiene (WASH) services can increase vulnerability to violence (Sommer, 2014). Lack of safely managed sanitation facilities in these informal settlements heightens risks of sexual violence for both men and women (Dickin & Gabrielsson, 2023).

Sexual violence refers to acts of sexual abuse that include rape, sexual assault, unwanted touching, and sexual harassment that is committed against women and men without their consent. Acknowledging the close link the sanitation environment, physical and

psychological emphasizes the necessity for a well-crafted understanding of sexual violence that is associated with the sanitation in regions that lack the sanitation facilities. (Sexual and Gender-based Violence - UNHCR Türkiye, n.d.). Understanding the negative effects of inadequate sanitation on individuals is significant for those designing interventions and assessing benefits and efficiency (Kayser et al., 2021). Sanitation is a critical element in public health and effectively considering gender while providing sustainable sanitation services, may contribute to improved relationships and attitudes towards the vulnerable population in the community. Exposure to violence can significantly hinder residents of informal settlements from accessing sufficient water, sanitation, and hygiene services (Okesanya, 2024).

In Kenya, 34% of women and 27% of men experienced physical violence, while 13% of women and 7% of men reported sexual abuse (KDHS, 2022). Evidence shows that inadequate sanitation services in informal settlements, such as Mathare, heighten vulnerability to sexual violence; for example, only 15% of households in Mathare have private toilets, while the remaining 85% must share facilities, with an average distance of over 52 meters to the nearest public toilet (Winter et al., 2023). While sanitation may not be perceived as the primary cause of sexual violence, it can frequently play a role in exposure to abuse. By providing access to safe sanitation facilities, there are possibilities of reducing incidences of cases of sexual violence experienced in the communities and school institutions (Winter et al., 2023).

1.2 Problem statement

Sexual violence remains a pervasive issue globally, disproportionately affecting children and women whereas men and boys are affected too, it manifests in various forms including rape, sexual harassment and exploitation, and it is influenced by deep seated cultural norms, socio-economic status, infrastructure, and access to services (WHO, 2024). The intersection between sexual violence and shared sanitation facilities is common in informal settlements, where these facilities are many times in adequate, insecure, and exposed to crime. This problem is compounded by inadequate access to sanitation, infrastructural challenges especially in informal settlements where shared sanitation facilities are often poorly maintained, insecure, and overcrowded (Colombo et al., 2023).

Globally, approximately two billion people lack access to safe water, while 3.6 billion have no access to safe sanitation facilities (WHO,2021). Informal settlements face even greater challenges, with 51.3% of sub-Saharan Africa's urban population living in this set up by 2020, with projections of a rise in the coming years Li. et., 2023). Studies from India and South Africa shows that inadequate sanitation facilities, particularly far distances, increases the potentiality to violence while accessing the shared sanitation facilities (Hazare & Tholiya, 2023).

Further, on a global scale, sexual violence remains a significant issue, with the World Health Organization (WHO) reporting that one in three women of reproductive age worldwide has experienced sexual violence at some point in her life (WHO, 2021). In these settings, women and girls face heightened risks of sexual violence, particularly in

areas lacking privacy, lighting, and safety features. Boys and men are also vulnerable to violence while accessing water and sanitation, but local masculinity norms often inhibit their ability to avoid or report such incidents (Sommer, 2019). This intersection of sexual violence and sanitation insecurity is a critical issue globally, regionally, and in Kenya, where millions continue to live in informal settlements without safe, private sanitation facilities, increasing their vulnerability to both physical and sexual violence.

The World Health Organization (WHO) and the United Nations have highlighted the urgent need to address both sexual violence and inadequate sanitation as part of the broader agenda for sustainable development, particularly under Goal 6 on clean water and sanitation and Goal 5 on Gender Equality (Martin, 2023). The availability of secure, private sanitation is linked to decreased vulnerability to sexual violence, yet millions worldwide still lack access to basic sanitation, especially in rapidly growing informal settlements (Abdulhadi et al., 2024).

Sanitation standards, as outlined by Sphere, have suggested that not more than 20 individuals should use a single latrine (Sphere Association, 2018). Improving access to safe sanitation facilities holds the potential to reduce incidents of sexual violence in these communities (Ombija et al., 2024).

Regionally, in sub-Saharan Africa, sexual violence remains a widespread problem, exacerbated by socio-economic disparities, insufficient policing, and the normalization of violence in some contexts (Kuupiel et al., 2024). In many urban informal settlements across the region, women and girls are particularly vulnerable to sexual violence in public spaces, including shared sanitation facilities (Nunbogu & Elliott, 2022). The lack of

proper infrastructure, coupled with overcrowding and inadequate security measures, increases the likelihood of sexual violence in such settings. Shared sanitation facilities in these regions often lack basic safety features like lighting, locks, or privacy, making them dangerous spaces for vulnerable individuals (Winter et al., 2023).

It is estimated that one billion individuals reside in urban areas, with over 50% of the residents in sub-Saharan Africa living in the settlements (Li et al., 2023). These informal settlements often feature limited sanitation facilities, often shared by multiple households, increasing sexual abuse (Barchi & Winter, 2020). A study conducted by Gibbs and Reddy (2020) in South African provinces of KwaZulu-Natal and Gauteng revealed that sexual violence frequently occurs in shared toilets, bathrooms, and water access points, potentially leading to physical assault, heightened anxiety, powerlessness, marginalization, and stigmatization.

In Kenya, sexual violence has been a persistent issue, with the country struggling with both high rates of GBV and inadequate access to safe sanitation. The KDHS (2022) reveals that in Kenya, 34% of women and 27% of men have experienced physical violence, while 13% of women and 7% of men have reported sexual abuse (KDHS, 2022). This data highlights the pervasive nature of gender-based violence in the country, with significant proportions of both women and men affected by violence, underscoring the urgent need for effective interventions and support systems to address these issues. In informal settlements such as Mathare, inadequate sanitation exacerbates this vulnerability. Only 15% of households in Mathare have private toilets, leaving 85% reliant on shared or public facilities, often located more than 52 meters away from their

homes (Winter et al., 2023). Such conditions force residents to navigate unsafe shared sanitation facilities, particularly at night, significantly increasing their risk of sexual violence.

The rapid growth of these settlements, fueled by rural-to-urban migration and a lack of affordable housing, has outpaced the development of essential services, including sanitation. MSF-Médecins Sans Frontières in Mathare indicates that instances of sexual violence have been documented within the informal settlement community (Ombija et al., 2024).

Jua Kali's socioeconomic status parallels that of Mathare and other Nairobi informal settlements like Kibera, Kiambiu, and Mukuru. This circumstance disproportionately impacts vulnerable individuals, particularly women and girls, who must travel considerable distances in poorly lit areas to access insecure toilets.

While sanitation alone may not be the root cause of sexual violence, it plays a critical role in exposure to abuse (Logie et al., 2022). Addressing this issue by improving access to safe, well-designed sanitation facilities can help reduce sexual violence incidents in informal settlements and other vulnerable settings (Winter et al., 2023). Understanding the relationships between socio-demographic factors, community perceptions, and sanitation-related risks is essential for designing targeted interventions that enhance safety and dignity for all residents.

1.3 Justification of the study

A clear need exists for policy direction, strategic guidance, and focused programming to address sexual violence risks associated with shared sanitation facilities in informal settlements. Current policy frameworks on sanitation and public health often overlook the unique vulnerabilities faced by residents in these densely populated, underserved areas, particularly women and girls who are disproportionately impacted by unsafe sanitation (Teresia, 2022). In Kenya, under the Presidency and Ministry of Devolution and Planning in 2014 developed the National Policy on the Prevention and Response to Gender-Based Violence to address Gender and GBV issues; whereas, the framework on Water and Sanitation Policy provides guidance on creating safer public spaces and promoting equitable access to sanitation (MOH, 2007). However, gaps persist in translating these policies into specific, on-the-ground interventions within informal settlements, where inadequate infrastructure, poor lighting, and limited policing make shared sanitation facilities high-risk environments for sexual violence. By focusing on the intersection of sanitation access and sexual violence, this study seeks to inform policymakers and program implementers on designing responsive interventions that enhance security, improve facility maintenance, and promote community-led safety measures, contributing to the broader aim of making informal settlements safer and more inclusive spaces for all residents.

1.4 Research questions

1. What is the prevalence of sanitation-related sexual violence among residents of Jua Kali informal settlement in Nairobi City County, Kenya?

2. What are the perceptions of Jua kali residents on sexual violence associated with sanitation facilities in Nairobi City County, Kenya?
3. What are the sanitation factors that contribute to sanitation-related sexual violence among residents of Jua Kali informal settlement in Nairobi City County, Kenya?

1.5 Objectives

1.5.1 Broad objective

To explore the sexual violence risks associated with shared sanitary facilities in Jua Kali informal settlements, Nairobi City County, Kenya.

1.5.2 Specific objectives

1. To determine the prevalence of sanitation-related sexual violence among residents of Jua Kali informal settlement in Nairobi City County, Kenya.
2. To assess the perceptions of Jua kali residents on sexual violence associated with sanitation facilities in Nairobi City County, Kenya.
3. To determine the sanitation factors contributing to sexual violence among the residents of Jua Kali informal settlement in Nairobi City County, Kenya.

1.6 Significance of the study

This study is significant in its potential to generate crucial insights into the link between shared sanitation facilities and sexual violence within informal settlements; an area that remains underexplored in public health research with limited quantitative data on prevalence and risk factors contributing to sanitation-related sexual violence (Winter et al., 2023).

By focusing on the Jua Kali informal settlements, this research underscores how structural challenges, such as inadequate access to private sanitation, high poverty levels, and widespread unemployment, contribute to unique vulnerabilities for residents, particularly concerning risks of sexual violence (Anthonj et al., 2023).

The findings are expected to inform evidence-based interventions designed to mitigate risks associated with shared sanitation facilities. Additionally, the research aims to provide valuable insights for policymakers, urban planners, and public health practitioners regarding the specific needs of informal settlement populations, facilitating the development of targeted sanitation and safety measures.

Beyond its local impact, this study holds broader implications for similar settlements worldwide, where inadequate sanitation resources and compounded social vulnerabilities frequently intersect. By addressing root causes identified through empirical and anecdotal evidence, the findings of this study can enhance community safety and support improved public health outcomes. Ultimately, the study contributes to the broader goal of creating safer, more dignified living conditions for marginalized urban populations globally.

1.7 Study limitations and delimitations

1.7.1 Delimitations

This study is deliberately confined to adult residents within informal settlements to direct data collection and analysis specifically toward the experiences of this demographic group. Although children and adolescents also encounter significant risks, limiting the focus to adults allows for a comprehensive examination of the unique factors influencing

this group in relation to shared sanitation facilities and associated sexual violence. Furthermore, the study is restricted to informal settlements with shared sanitation facilities, excluding formal urban and rural settings. This decision reflects the intent to examine environments where shared sanitation is prevalent, as these settings are known to present heightened risks and unique challenges concerning privacy, security, and access.

The study also focused exclusively on shared sanitation facilities, intentionally excluding private sanitation and other public infrastructure. This targeted scope enabled a detailed investigation of how shared sanitation specifically affects the risk of sexual violence, facilitating a clearer identification of vulnerabilities linked to these facilities. Data collection was designed to capture information within a defined timeframe, emphasizing recent experiences of sexual violence related to shared sanitation facilities rather than assessing long-term trends. Finally, the study primarily examined risk factors directly associated with shared sanitation, such as facility location, lighting, proximity, and accessibility, rather than broader socio-economic or cultural factors. This focused approach ensured a thorough analysis of sanitation-specific issues that could be effectively addressed through targeted policy and infrastructure interventions in informal settlements.

1.7.2 Limitations

The study is confined to informal settlements with shared sanitation facilities, excluding formal settlements and rural areas where different sanitation structures may affect exposure to sexual violence differently. This scope may not capture the full spectrum of

vulnerabilities associated with various types of sanitation facilities across different settings. To address this limitation, secondary data from the scholarly journals conducted were reviewed and included in the discussion.

According to studies, the research design may rely on self-reported data, which may result in recall bias, inadequate reporting due to the sensitivity of sexual violence, and social desirability bias, particularly in populations where talking about sexual violence causes shame (C.A. Kelly et al., 2013). To mitigate introduction of biases, the survey instruments were designed to ensure anonymity and confidentiality as a way of encouraging the study respondents to provide honest responses. This study utilized validated tools for assessing experiences of sexual violence so as to enhance reliability and data consistency. Furthermore, mixed-methods were adopted, to include qualitative data from in-depth interviews and focus group discussions with aim of triangulating the data to minimize the impact of biases.

Furthermore, the cross-sectional nature of the study limits its ability to establish causation between shared sanitation facilities and the incidence of sexual violence, as it can only provide a snapshot of associations at one point in time. Additionally, the lack of longitudinal data prevents an analysis of how changes in sanitation access over time might influence sexual violence risks.

Lastly, the study may not fully account for environmental factors (such as lighting, proximity to homes, or community policing presence) and broader contextual influences (like cultural norms and economic conditions) that can affect the risk of sexual violence

in informal settlements, potentially limiting the ability to isolate the impact of shared sanitation facilities alone on sexual violence incidence.

1.8 Theoretical framework

This study uses a theoretical framework to explore how demographic factors, sanitation-related variables, and community perceptions influence the risk of sexual violence in shared sanitation facilities in informal settlements. The theoretical framework integrates three key theories namely Routine Activity Theory (RAT), Feminist Theory, and Crime Prevention Through Environmental Design (CPTED).

Routine Activity Theory (RAT), developed by Cohen and Felson (1979), posits that the likelihood of crime occurring depends on the convergence of three elements: a motivated offender, a suitable target, and the absence of a capable guardian. In the context of informal settlements, shared sanitation facilities are often poorly lit, isolated, and lacking security, creating opportunities for offenders to target vulnerable individuals. The absence of guardians, such as security personnel, further increases the likelihood of sexual violence. This theory provides a lens for understanding how the infrastructural characteristics of shared sanitation facilities may heighten vulnerability to sexual violence.

Feminist Theory offers a critical perspective on gender inequalities, emphasizing how power imbalances in informal settlements heighten vulnerability to sexual violence. Gender norms and social structures in these communities often increase exposure to violence, particularly in public spaces like shared sanitation facilities.

Environmental Design Theory (CPTED) focuses on the role of physical design in crime prevention. The location, accessibility, and layout of shared sanitation facilities, such as their distance from homes or lack of proper lighting, can significantly influence safety and security. This theory will help assess how these factors contribute to the risk of sexual violence.

Overall, this framework will guide the study in analyzing the interplay between demographic factors (such as age, gender, and socio-economic status), sanitation-related factors (such as facility design, location, and accessibility), and community perceptions (including attitudes toward safety and reporting). By examining these interconnected factors, the study aims to identify the structural and social elements that contribute to sexual violence and provide evidence for policy recommendations to improve safety in shared sanitation environments.

1.9 Conceptual framework

This framework outlines a structured approach for analyzing the risk factors for sexual violence in shared sanitation settings. The dependent variable is sexual violence, which is defined by various acts such as rape, sexual assault, sexual harassment, and sexual exploitation. The prevalence and occurrences of sexual violence are assessed through self-reported experiences using self-administered questionnaires.

The independent variables include demographic factors, sanitation-related factors, and community perceptions, which are conjectured to influence the risk of sexual violence in the informal settlement. Demographic factors include age, gender, and socio-economic status, which shape vulnerability. Sanitation-related factors focus on the design, location,

and accessibility of shared sanitation facilities, which may impact safety and exposure to risks. Perceptions refer to community attitudes and beliefs about safety, reporting violence, and the role of authority in ensuring security. These variables are examined to understand how they contribute to the occurrence of sexual violence in informal settlements.

Independent factors

Dependent Factors

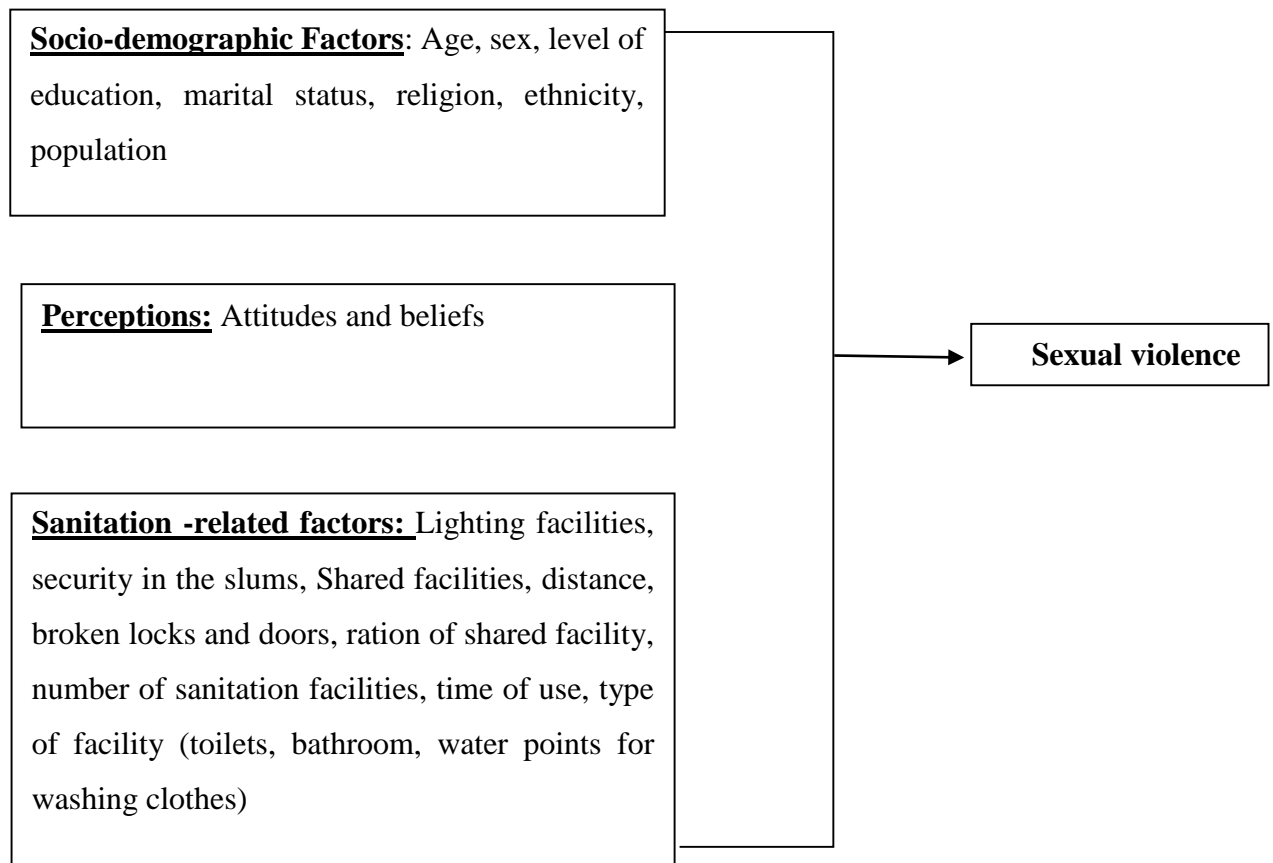


Figure 1.1: Conceptual framework

Source: Author, 2016

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of the literature that pertains to the purpose and objective of the study. It lays down the magnitude of sexual violence from a global point of view. The chapter outlines the concept of sexual violence in relation to shared sanitation facilities and the extent to which shared sanitation contributes to the heinous act in the informal settlements. Lastly, the section will delve into the severity of sexual violence and examine the existing gaps.

2.2 Prevalence of sanitation-related sexual violence

Approximately 30% of women globally have encountered physical and/or sexual intimate partner violence or non-partner sexual violence in their lifetime (WHO,2021). Sexual violence is defined as "any sexual activity, endeavor to engage in sexual activity, or any act that manipulates a person's sexuality through coercion. This can be perpetrated by anyone, regardless of their connection to the victim, and can occur in any context. It involves instances such as rape, which is defined as the forced or coerced penetration of the vulva or anus with a penis, body part, or object, as well as attempted rape, unwelcome sexual touching, and various forms of non-contact actions" (WHO, 2021).

There are limited statistics globally on sexual violence among men. Nonetheless, research from the Centre for Disease and Control (CDC) suggests that 1 in 6 men has encountered sexual violence before reaching the age of 18, which may be considered an understatement of the true prevalence due to the culture of men failing to disclose such experiences. According to a 2016/17 CDC report, approximately one in 13 men in the

U.S. (7.6% or over 8.9 million) experienced sexual violence at some point in their lives (Leemis et al., 2022). The findings further revealed that less than 1% (0.5% or 560,000) reported experiencing rape, 2.8% (3.3 million) were forced to penetrate, 5.0% (5.9 million) faced sexual coercion, and 2.1% (2.5 million) encountered unwanted sexual contact over their lifetime.

Evidence indicates that sexual violence remains a significant concern within the population aged 15 to 49. The survey revealed that 13% of women and 7% of men in this age group have encountered sexual violence in their lives. These statistics underscore the urgent need for comprehensive efforts to address and prevent sexual violence in Kenya (KDHS, 2022).

Limited sanitation access not only affects health but also compromises security and privacy, heightening vulnerability to sexual abuse, with residents widely perceiving a risk of physical harm and degradation when using communal facilities (WHO, 2024). Although sexual violence against women is more prevalent, abuse against men often goes unnoticed (Ghosh & Kumar, 2024). Report by CDC in 2016/17 indicates that one in 13 men (7.6% or more than 8.9 million) of U.S. men reported sexual violence in their lifetime (Leemis et.al., 2022). The report further showed that less than 1% (0.5% or 560,000) reported rape, 2.8% (3.3 million) were forced to penetrate, 5.0% (5.9 million) abused through sexual coercion, and 2.1% (2.5 million) of men reported unwanted sexual contact during their lifetime.

Evidence shows that men, can experience sexual violence and other forms of abuse, though societal stigma and stereotypes often make it difficult for male survivors to come

forward. (Kolbe & Büttner, 2020). Traditional views of masculinity often discourage men from disclosing experiences of victimization, as vulnerability is seen as conflicting with societal expectations of male strength and resilience. This perception contributes to significant underreporting of sexual violence against men, and a lack of awareness and understanding of the issue (Javaid, 2019). Research highlights that some of the reasons men hesitate to report experiences of violence include fears of not being taken seriously and concerns that coming forward could lead others to question their masculinity (Ghosh & Kumar, 2024).

In Kenya, the impact of sexual violence, which includes rape, is devastating in all social, economic, and cultural settings (KDHS,2022). The Sexual Offenses Act (SOA) stipulates that rape is the act of using physical force or coercion to penetrate the vulva, vagina, or anus using a penis, body parts, or any object (SOA, 2006, revised in 2009). The consequences include enduring emotional trauma, psychological issues, compromised reproductive health, and an elevated susceptibility to contracting HIV/STIs, with effects that can last a lifetime (Sigurdardottir & Halldorsdottir, 2021). Studies suggest that individuals who reported incidents of coerced sexual violence are at a significantly higher risk of developing depression and post-traumatic stress disorder compared to those who have not experienced such traumatic events (Choi et al., 2023).

Thirty-five percent of Kenya's population lives in urban centers where access to essential services, including sanitation, is severely limited. with highly constraining basic services, including sanitation. This is further compounded by the sprawling informal settlements known as informal settlements. In a social-economically challenged community setup

like the slums, differences in power as described by the gender roles put women at risk while utilizing community-based resources (Maranga Njoroge et al., 2023).

In recent times, research has highlighted that insufficient community sanitation amenities contribute substantially to sexual violence in the population. Sanitation facilities form a significant community resource in the informal setup. Largely, appropriate sanitation facilities are viewed as latrines or toilets and bathrooms (Kipkoech et al., 2023). Moreover, communal sanitation facilities are viewed unfavourably by community members due to concerns about cleanliness and accessibility (Colombo et al., 2023). These facilities might also be unavailable during nighttime or peak demand periods (Dickson-Gomez et al., 2023). Community sanitation blocks provide shared space for residents to access toilets, bathrooms, and water points irrespective of gender. Shared facilities constitute a significant and expanding sanitation choice within informal settlement communities, with the practice being particularly prevalent in Ghana, where it stands at 59% (Meili et al., 2021). Inhabitants of the informal settlements reside on government-owned land, which implies that they lack official property titles and, as a result, are unable to finance the construction of proper permanent structures such as houses and sanitation facilities. Sanitation facilities are constructed at a considerable distance from residential units, lacking sufficient lighting and security measures. World Health Organisation (2024) argues that a lack of sanitation access has significant non-health impacts, including reduced security and privacy, which may increase the risk of sexual abuse. These factors create vulnerable conditions, as individuals are often required to use communal sanitation facilities located away from their homes, heightening their exposure to potential abuse and compromising their sense of safety.

The Jua Kali informal settlement in Nairobi County lies within the urban informal settlement region characterized by irregular sources of income, illegal brewing points, theft, consumption of local brew, prostitution, a few community sanitation blocks situated a distance from the housing units (KIPPRA, 2024). A study carried out in Khayelitsha, South Africa, with the goal of reducing sexual violence through enhanced toilet accessibility, confirms that key contributors to sexual abuse involve indoor sanitation and the necessity to travel to outdoor sanitary facilities (Ray, 2022). Enhancing access to these amenities is expected to result in a concurrent decrease in sexual violence incidents and the overall societal expenses associated with it (Winter et al., 2023). In the urban areas of developing countries, the residents are exposed to numerous security situations that contribute to sexual abuse when they attempt to access the facilities to defecate or bathe. Research in the Kibera community highlights that inadequate sanitation, particularly the lack of gender-segregated toilets and bathrooms, leaves many households vulnerable to sexual abuse by male perpetrators (UN-Habitat, 2020). Kenya's government has established a legal structure to regulate sanitation facilities and their utilization (Ministry of Health, 2016). This framework is delineated in the Kenyan constitution (2010), specifically in the 4th schedule and Article 43, which guarantees the right to appropriate sanitation requirements (Constitution of Kenya, 2010, 2010). Moreover, environmental sanitation in Kenya is predominantly regulated by the Public Health Act (Public Health Act (Cap. 242), n.d.). Acts of sexual violence may lead to consequences that affect all persons in terms of physical, mental, and reproductive health, though women and girls are disproportionately affected and are at heightened risks (Sigurdardottir & Halldorsdottir, 2021).

Various studies and documentation by researchers have gathered quantitative and qualitative statistical information referencing the magnitude of sexual violence meted out to the residents while accessing sanitation facilities in informal settlements. In densely populated and inadequately monitored informal settlements, the combination of subpar sanitation conditions and shared sanitation facilities heightens the susceptibility to sexual violence (Winter et al., 2023). A research investigation carried out by Amnesty International in 2011, focusing on the informal settlements of Honiara in the Solomon Islands, confirms that several residents experienced assaults while bathing, including instances of sexual violation. As a consequence of the absence or limited availability of shared sanitation facilities, women and girls' resort to relieving themselves in nearby bushes and streams close to their residential areas.

Women and girls bear a disproportionate burden related to injustices occasioned to them, which affects their dignity (WHO, 2023). A comprehensive review article on sanitation, informal settlements, and factors that influence the health of women in Kenya, carried out in Mathare informal settlements depicts a scenario of indignity and violence to which women in the informal settlements are subjected, accentuated by fear of rape, especially at night, constipation, urinary tract infections and further using unorthodox means of relieving themselves.

Research conducted in the Kibera slums of Nairobi confirms that sanitation remains a significant issue in this community, with households lacking toilets (UN-Habitat, 2020). This situation increases the vulnerability to sexual abuse by male residents, given that bathing and toilet facilities are non-gender-segregated. Moreover, a substantial body of

evidence illustrates that a large number of sexual violence incidents take place within informal settlements while utilizing a toilet or bathing; in addition to physical attacks, violence results in heightened anxiety, a feeling of helplessness, despair, social isolation, and the stigmatization of survivors. Research in India similarly reveals that residents, particularly women, fear sexual violence when using shared public toilets or practicing open defecation, with many reporting experiences of rape and harassment (Ismail et al., 2024). Residents express anger due to lack of anger protection, poor processing of cases by police, and lack of attention by the government in their investment plan (Muuo et al., 2020).

2.3 Perceptions associated with sexual violence in relations to shared sanitation

In the context of informal settlements, residents' perceptions, defined here as their attitudes, beliefs, and awareness regarding safety, risks, and the reporting of sexual violence (Teresia, 2022). There are critical factors influencing their experiences and behaviors associated with shared sanitation facilities. Shared sanitation, often located in isolated, poorly lit, and under-secured areas, presents significant environmental risks that can heighten perceptions of insecurity and vulnerability among residents (Wutich et al., 2020). Studies have shown that these perceptions are shaped by social norms, prior experiences, and community attitudes toward sexual violence, all of which can either increase or decrease the likelihood of reporting incidents and taking preventive measures (Sommer et al., 2019).

Research suggests that perceptions of risk and safety are often influenced by demographic factors such as gender, age, and socio-economic status (Winter et al., 2021). For instance,

in India, women and marginalized groups perceived greater vulnerability when using shared sanitation facilities, as they are disproportionately affected by harassment and violence in these spaces (Kayser et al., 2021). These perceptions of sexual violence risk can lead to behavioral changes, such as avoiding sanitation facilities at certain times of day or using alternative, less safe methods for sanitation, which in turn can have adverse health consequences (Jayaweera et al., 2022).

In addition to demographic factors, social norms and collective attitudes within communities play a significant role in shaping perceptions of safety and sexual violence risk. In many informal settlements, cultural taboos around discussing sexual violence or seeking justice can deter victims from reporting incidents (Perrin et al., 2019). Perceptions of the risk of social stigma and retribution may prevent sexual violence survivors from disclosing experiences of violence, particularly if community members hold traditional beliefs that blame victims for the violence they experience (Schmitt et al., 2020). This reluctance to report not only hampers access to justice but also perpetuates cycles of violence by shielding offenders from accountability (Izu et al., 2024).

The physical environment and design of sanitation facilities also influence perceptions of sexual violence. Poorly designed facilities that lack privacy features, adequate lighting, or secure access points can foster fear among users, even if they have not personally experienced violence (Humanitarian Innovation Fund, et al., 2018). The presence or absence of guardians, such as security personnel or neighbors, may further impact individuals' comfort levels. For instance, CPTED principles indicate that well-designed

spaces, which incorporate visibility and surveillance, can reduce perceived risks and make residents feel safer (Hayes & Maher, 2023).

Lastly, perceptions of institutional support and community-based reporting mechanisms influence both the likelihood of reporting sexual violence and residents' willingness to use shared sanitation facilities. Residents who believe that local authorities or community leaders are responsive and supportive in addressing violence-related issues may be more inclined to report incidents and feel safer. Conversely, a lack of trust in law enforcement or in the capacity of community structures to handle cases of sexual violence can reinforce perceptions of insecurity (Rockowitz, 2024). This mistrust often arises in settings where authorities are either inaccessible or perceived as unresponsive to residents' needs, further exacerbating feelings of vulnerability.

Perceptions around shared sanitation facilities and sexual violence risks in informal settlements are further influenced by historical and societal gender dynamics (Hayes & Maher, 2023). In many settings, gender roles and expectations impact who bears the primary responsibility for accessing sanitation facilities and water resources, often disproportionately burdening women and girls with these tasks (Kayser et al., 2021). This pattern is especially evident in informal settlements where gendered expectations shape the use of shared sanitation facilities, heightening the risk of sexual violence for vulnerable persons (Winter et al., 2023). Consequently, residents may perceive shared sanitation facilities as inherently unsafe for vulnerable users, fostering a general distrust of these spaces and complicating efforts to promote equitable access.

Community dynamics and collective efficacy also play a critical role in influencing perceptions related to safety and the risks associated with shared sanitation and sexual violence. Collective efficacy, the shared belief in a community's ability to intervene for the common good, can act as a protective factor, with strong social bonds enabling residents to look out for one another and address local safety concerns (Gram et al., 2021). Studies indicate that in informal settlements where collective efficacy is high, residents are more likely to feel safer, as neighbors actively participate in informal surveillance or support reporting mechanisms (Atkinson, 2024). In contrast, in settings where social cohesion is weak or fragmented, there may be a higher perception of risk, as residents feel isolated and unable to rely on community support, thereby reducing their willingness to access shared facilities.

Structural and economic factors also heavily influence perceptions of safety in informal settlements. Financial constraints often lead to underinvestment in sanitation infrastructure, resulting in facilities that lack privacy, proper maintenance, or adequate lighting—each of which contributes to heightened perceptions of risk (Sinharoy et al., 2019). Limited ward level support and the slow response to infrastructural needs can create an environment where individuals feel unprotected and at risk. For instance, residents of impoverished areas may lack the financial means to build safer, private facilities, relying instead on shared options that are perceived as dangerous due to neglect and inadequate design (Colombo et al., 2023).

Another aspect that influences perceptions is the psychological impact of previous exposure to violence. Research suggests that individuals who have experienced or

witnessed violence may develop a heightened sensitivity to perceived threats, affecting their sense of safety in various environments, including shared sanitation facilities (Baker, 2018). This "hypervigilance" can lead to avoidance behaviors, whereby residents use sanitation facilities less frequently, often at the expense of personal health and hygiene. In this context, perceptions are influenced not only by physical realities but also by psychological responses to prior trauma, emphasizing the complex interplay between environment, past experiences, and perceived safety.

Lastly, interventions by NGOs and community groups also shape perceptions, both positively and negatively. Programs that provide security, infrastructure upgrades, or education on personal safety particularly on sexual violence, can improve residents' perceptions of shared sanitation spaces (Kayser et al., 2021). However, the framing of such interventions can also unintentionally reinforce fears. Thus, the role of NGOs and local organizations is crucial in managing perceptions to support both awareness and a sense of security among residents.

In summary, perceptions surrounding shared sanitation facilities are shaped by a combination of individual demographics, community norms, environmental factors, and institutional support structures. These perceptions significantly impact the use, safety, and reporting behaviors of residents in informal settlements, particularly in relation to the risk of sexual violence. Understanding these perceptions is crucial for developing targeted interventions that address both the physical and social dimensions of sanitation-related vulnerabilities in informal urban settings.

Myths contribute significantly to describing perceptions relating to sexual violence (WHO,2023). The existing viewpoints influence how society reacts to sexual violence and its victims. Selected statements illustrating these misconceptions encompass the beliefs that the residents are sexually violated by unfamiliar individuals in dim, outdoor locations; the shame associated with male rape surpasses that of female victims; the offenders are a small fraction of mentally ill persons; economic hardship leads to attacks on vulnerable residents; and sexual violence results from alcohol and substance abuse (Tidmarsh & Hamilton, 2020).

These misconceptions contribute to the belief that sexual violence is triggered by factors beyond men's responsibility. These statements are often employed to rationalize acts of violence, which subsequently places the burden on women to reduce the likelihood of their behavior inciting violence. An examination of the literature further reveals a widely accepted notion that women face the threat of physical violence and degradation when accessing communal sanitation facilities (Ismail et al., 2024).

2.4 Sanitation factors

2.4.1 Research Scarcity of sanitation facilities and increased sexual violence risk

Research indicates that in many slum communities, basic sanitation facilities like latrines and washrooms are often sparse, contributing to overcrowding, lack of privacy, and heightened security risks (Dickson-Gomez et al., 2023). All residents in informal settlements are vulnerable to risk of sexual violence when using shared sanitation facilities, though women and children are disproportionately affected (Colombo et al., 2023). Limited sanitation options force residents to rely on these shared sanitation

facilities, risking sexual harassment, voyeurism, and assault during routine activities (Winter et al., 2023). The lack of accessible, safe, and hygienic sanitation facilities in these settings exemplifies the challenges facing millions in informal settlements globally, where the absence of proper infrastructure not only degrades health standards but also amplifies security concerns, turning a basic human need into a safety hazard.

2.4.2 Socio-economic barriers to safe sanitation

The affordability of sanitation hardware is a significant barrier for informal settlement residents, who often cannot afford to build or access private sanitation facilities (Sinharoy et al., 2019). Consequently, many slum residents rely on shared sanitation facilities, which are frequently overcrowded and poorly maintained. Human rights to sanitation prescribe that there shall be sufficient number of sanitation facilities for use by all residents in an informal settlement (WHO, 2018). Research indicates that a single communal latrine often serves between 50 to 150 people daily, significantly exceeding the Sphere Standards recommendation of one toilet for every 20 individuals. This overcrowding contributes to increased insecurity and heightened risks of sexual violence (Jayaweera et al., 2022). This level of overcrowding exacerbates the privacy and safety issues, especially for vulnerable groups. The socio-economic limitations in these areas not only affect access to adequate sanitation but also contribute to the broader cycle of poverty, health risks, and safety vulnerabilities, where residents are forced to compromise their well-being due to a lack of affordable, safe alternatives.

2.4.3 Impact of inadequate lighting and gender segregation on safety

According to the Sphere Standards (2018), toilets should be designed and built to reduce safety and security risks for all users and maintenance personnel, with special attention to women, girls, children, the elderly, and people with disabilities. Lighting and gender segregation in sanitation facilities are crucial for ensuring safety, but many informal settlements lack these provisions. The established a recommended standard of three female toilets for every male cubicle, yet in informal settlements, this ratio is rarely observed (Sphere standards, 2018). Proper lighting around sanitation facilities serves as a deterrent to potential perpetrators, yet the absence of these basic measures creates dark, secluded areas that invite crime (Humanitarian Innovation Fund, et al., 2018). Gender-segregated facilities are essential to minimize risks for women, girls, and other vulnerable groups, but such facilities are uncommon in slum areas (Sphere, 2018). Lack of segregation and lighting makes shared sanitation facilities inherently unsafe, exposing users to the risk of sexual violence and reducing their sense of security.

2.4.4 Geographical barriers to safe sanitation access

Physical proximity to sanitation facilities is a key factor influencing residents' safety and well-being. In informal settlements, shared latrines may be located far from homes, may discourage use of these facilities due to fear of violence. Sanitation facilities should be located within 50 meters of dwelling areas, offering privacy, secure internal locks, and ensuring user safety at all hours (Colombo et al., 2023). Poorly lit paths, remote areas, and lack of security along these routes elevate the risk of harassment or assault for those using the facilities after dark. The fear of venturing far to access latrines has led some

residents to resort to “flying toilets”, the use of plastic bags for waste disposal (Busienei et al., 2019). This practice, though unhygienic, highlights the lengths to which residents go to avoid the dangers associated with unsafe walks to shared sanitation facilities, underscoring the urgency for nearby, secure sanitation solutions.

2.4.5 Gendered risks and privacy concerns in shared facilities

Privacy is a critical factor in the safety and dignity of sanitation users, particularly in shared facilities. In informal settlements, limited space and inadequate planning have resulted in sanitation facilities that lack gender-specific segregation (Dickson-Gomez et al., 2023). This forces men and women to share the same facilities, often compromising their privacy and increasing the risk of sexual violence. Poor city planning, rapid population growth in informal settlements, and lack of regulatory oversight exacerbate these issues, leaving residents to navigate unsafe, overcrowded spaces (Ouma et al., 2024). The shared nature of these facilities exposes individuals to harassment, voyeurism, and privacy violations, which are intensified by the lack of designated, gender-segregated latrines. This not only increases the physical risk of sexual violence but also perpetuates a cycle of fear and reduced quality of life for those living in informal settlements.

2.4.6 Standards for safe and accessible sanitation

The Sphere Standards (2018) outline critical benchmarks for sanitation, emphasizing that facilities must be accessible, safe, and culturally appropriate, and located close to residential areas. These guidelines aim to ensure that individuals can access sanitation without risking personal security, even at night. However, these standards are rarely met in informal settlements, where the placement of facilities is often dictated by limited space

and lack of infrastructure. Proximity to homes is especially important for reducing risks, as it allows residents to use facilities without lengthy, unsafe walks (Tallman et al., 2022). The Sphere Standards emphasize that sanitation infrastructure should not only meet hygiene needs but also prioritize security, particularly for vulnerable populations. Adherence to these standards in informal settlements could drastically reduce the risk of sexual violence and create a safer, more dignified environment for residents.

2.4.7 Psychosocial impact of sanitation-related violence

Research by Ombija et al. (2024) highlights the significant psychosocial stressors faced by individuals, particularly women, when accessing sanitation facilities in slums. These stressors include fear of harassment, sexual assault, and other forms of violence, thus heightened anxiety and psychological distress. For many residents, the daily struggle to find safe spaces for sanitation imposes a toll on mental health and increased vulnerability to sexual violence (Winter et al., 2023). Wamukoya et al. (2020) reveal a gap in government's where the lack of safe sanitation options for residents contributes to increased vulnerability and psychosocial harm, underscoring the need for urgent policy and infrastructure interventions.

2.5 Summary of literature review isolating study gap

This chapter delved into a desktop review of the research topic and keenly reviewed the history of the problem, perceptions associated with sexual violence in relations to shared sanitation and the associated impact.

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter offers an overview of the research design and the variables being examined, the study location, and the population. It also includes details for selection criteria, techniques employed to determine the sampling methods, the process of determining the sample size, and instruments used for data collection. Further, it accentuates the pilot study, the assessment of validity and reliability, methods used for acquiring information, methods required to scrutinize this data, and the practical as well as moral aspects involved.

3.2 Study design

A mixed-methods approach to data collection was employed in a cross-sectional observational design which involved a combination of both qualitative and quantitative data collection methods (Wang & Cheng, 2020). The study design aimed at investigating relationships and associations between variables without manipulating them. The utilization of this approach aimed at providing a description of the prevailing situation during the study and to investigate the underlying factors that contributed to specific phenomena. To minimize recall bias associated with cross section design, research questions were designed focusing on recent experiences within the past year (Kelly et al., 2024).

3.3 Study Variables

The dependent variable is the focus of the researcher's interest. This study utilized appropriate techniques to measure and assess variations in the dependent variable. The dependent variable for this study included Sexual violence. The variables considered as independent in this study encompassed socio-demographic elements like age, gender, marital status, and religion. Additionally, perceptions including community norms and factors related to sanitation such as facility lighting, security within the slums, shared facilities, distance to facilities, broken locks and doors, proximity of housing to shared sanitation, timing of use, and facility type were also taken into account.

3.4 Study area

This included the Jua Kali informal settlement where the study was carried. Jua Kali informal settlement is located in Nairobi City County, Kenya (Appendix 6.1: Map of Kenya showing Jua Kali informal settlement) 1.2053° S, 36.8627° E. The national population census survey approximated the population of Jua Kali informal settlements to 3,500 persons (Kenya National Bureau of Statistics, 2019). The Jua Kali informal settlement was selected owing to the nature of it being within the suburbs of Nairobi depicting all the characteristics of an informal settlement, with challenges in sanitation and security like other informal settlements within the city.

3.5 Study location

In this study, the study location is defined as the individual households within the Jua Kali informal settlement in Nairobi City County, Kenya, where questionnaires were administered. Data collection was carried out at the household level, enabling the

gathering of residents' personal experiences and perceptions related to the shared sanitation facilities in the settlement, including communal toilets, latrines, and bathing areas. This household-based approach intended to provide an in-depth understanding of the environmental and social factors that contribute to the risk of sexual violence associated with the shared facilities.

3.6 Target population

The target population for this study included adult residents of the Jua Kali informal settlements in Nairobi, Kenya. This population comprised of individuals living in informal housing with limited access to basic sanitation infrastructure. Given the study's focus on sexual violence related to sanitation access, the target population consisted of both men and women aged 18 and above and met the eligibility criteria.

3.7 Eligibility of participants

3.7.1 Inclusion criteria

The inclusion criteria were adults who have been residing in Jua Kali informal settlement for at least one (1) year and must be of sound mind and consented to the study.

3.7.2 Exclusion criteria

The study excluded individuals who were below 18 years, those who had not reside in Jua Kali informal settlement in the last one year, and those who declined to participate.

3.8 Sampling procedures

3.8.1 Sampling technique

Nairobi City County was intentionally chosen due to the sprawling informal settlements within an urban area and characterized by typical challenges associated with sanitation and violence. The county is home to over 65% of the city's 3.2 million residents, who reside in informal settlements that cover less than 10% of the total land area (Obeng-Odoom, 2013). People living in Nairobi's slums have worse health outcomes compared to those in other urban areas (Emina et al., 2011).

Within the Jua Kali informal settlement, households were systematically selected where every K th value was calculated by dividing the entire population by the chosen sample size. For this thesis, a member of the household meeting the inclusion criteria was selected from every 10th household. When creating a sampling framework for 381 participants out of an overall population of 3,500 individuals, the first step was to determine a 'sampling interval. This was achieved by dividing the total number households with the target sample size.

Sampling Interval = Total Number of Households/Desired Sample Size

Sampling Interval = $3500/381 = 9.18$ (rounded to the nearest whole, which is 9)

Afterward, the sampling frame was generated by assigning unique numbers to each household in the Jua Kali settlement, ranging from 1 to the total number of households (3500), through a physical listing process. The starting household was chosen randomly from within the first sampling interval by drawing a pre-numbered paper (0–9). After establishing this starting point, the sampling interval was applied systematically from that

household, ensuring a consistent and unbiased selection process. The birthday method was used to select one eligible respondent aged 18 or older per household, choosing the individual with the most recent birthday to ensure an equal, unbiased selection, enhancing the data's representativeness and reliability.

Key informants were selected intentionally due to the sensitive and confidential nature of the research. Finally, FGD participants were also sampled purposively to give general information about the status of shared sanitation facilities and the cases of sexual violence in Jua Kali informal settlements.

3.8.2 Sample size determination

Fischer et al. (1998) formula was used since the level of sexual violence resulting from shared sanitation facilities is not known in Kenya and thus was assumed to be 50%.

$$n = \frac{z^2 x p(1 - p)}{d^2}$$

n= sample size

z= 95% confidence level

p= Level of sexual violence associated with shared sanitation is not known, therefore 50% (0.5)

d = error margin of error at 5%

$$n = \frac{1.92^2 x 0.5(1 - 0.5)}{0.05^2}$$

n = 384.16 approximately 385

For sample size below 10,000; **nf = n/ (1+n/N)** (Cochran et. al, 2012)

(Jua kali informal settlement population approximately 3,500)

Implication;

nf = the projected size of an ideal sample

N= Approximated total population count falling under 10,000 individuals

n= Estimated measure of when our target collective (N) ranges equal to or beyond a standard value set at 10,000.

Substituting: $nf = 385 / (1+385/3500) = 347$ respondents

To address the possibility of non-response, the adjusted sample size used was 10%.

Therefore, the sample size was **around 381** respondents.

3.9 Establishing validity and reliability in data collection instruments

3.9.1 Validity

To establish content validity, the study engaged subject matter experts in Gender-Based Violence, public health, and sanitation, who reviewed the data collection tools (Setia, 2017). These experts assessed whether the questions comprehensively covered all relevant aspects of the study's objectives, ensuring that key areas were included. Additionally, items in the tools were compared with measures from previous studies on sexual violence and sanitation, which helped to confirm that questions reflected established constructs in the field (Ergün et al., 2024).

To address face validity, a pilot study was conducted with a small, representative sample from the study population to identify unclear, ambiguous, or culturally inappropriate questions. Feedback from the pilot test was used to refine the wording and adjust items that were misinterpreted. Furthermore, input was gathered from two community members from the target population to verify the appropriateness and relevance of the questions, especially for the FGD and KII guides. This was important to ensure that language and cultural nuances did not compromise the clarity of questions (Setia, 2017).

Construct validity was ensured by structuring the self-administered questionnaire in a logical sequence, with questions organized by topic areas such as socio-demographic factors, perceptions of violence, and sanitation-related factors. Each question was carefully worded to avoid ambiguity, which helped maintain focus on the constructs of interest (Hatta et al., 2024). The questionnaire incorporated items from validated scales, particularly for questions on sensitive topics like experiences of violence. This alignment with established measures supported the construct validity of the tool (Caduff & Ranganathan, 2023). Internal validity was reinforced by designing the questionnaire to minimize biases and ensure that questions accurately captured the intended constructs (Patino & Ferreira, 2018). External validity was enhanced by using a sampling method that captured a representative cross-section of the study population, allowing the findings to be generalized to similar informal settlements facing comparable socio-economic and sanitation challenges (Andrade, 2018).

3.9.2 Reliability

Reliability pertains to the repetitious use of scientific instruments to consistently produce dependable data. It indicates how consistent a research instrument provides similar results or data across multiple iterations (Ahmed & Ishtiaq, 2021). In this study, research assistants underwent specialized single-day educational session focused on guiding the participants in areas where clarification was required, address any technical concerns and ensuring privacy during process. The questionnaires were meticulously designed and underwent pretesting in the neighboring Kiambu County. To gauge the questionnaire's reliability in measuring its intended constructs, the researcher evaluated its internal consistency. All Key Informant Interviews (KIIs) were conducted by the principal investigator. Additionally, the researcher diligently reviewed the data to rectify any evident errors that might have occurred during analysis and transcription. Both the researcher and supervisors cross-verified the developed codes.

To ensure comprehensive data triangulation, diverse information sources were employed. The data collection team comprised four research associates and community Health practitioners (CHPs), who documented interview notes. Furthermore, Focus Group Discussions (FGDs) were recorded using audio recording devices.

3.9.3 Pilot testing of tools

The pilot of data collection tools for this study was conducted in Njatha-ini informal settlement in Kiambu County, adjacent to the primary study area. This site was selected to provide a setting similar to Jua Kali, allowing for the identification and resolution of potential issues that could arise during data collection. Approximately 38 respondents,

representing about 10% of the main study sample size, were selected for the pilot, using the same sampling methodology intended for the main study to maintain consistency.

The process revealed several key areas for improvement including translation of the tool into Swahili as among the preferred language and for ease of response. According to In (2017), once a pilot study has been conducted and the data collection tool has been adequately revised to ensure clarity in all aspects of data collection, the researcher may proceed with the main study following any necessary modifications. Some questions, particularly those related to socio-demographic factors and perceptions of violence, were noted to have ambiguous wording that led to varied interpretations among respondents. Based on this feedback, these questions were revised to improve clarity and ensure that all participants would interpret them as intended.

The original questionnaire was found to be lengthy, causing some respondents to experience fatigue, which resulted in incomplete responses. Consequently, non-essential questions were removed, and some sections were condensed to reduce response burden and minimize the likelihood of respondent fatigue.

Questions about experiences of violence were identified as potentially distressing. Adjustments were made to the language to make these questions more empathetic, and respondents were provided with guidance on their right to skip any questions they found distressing. Pretesting highlighted the need for expanding the response options for certain questions, as some respondents found the available options insufficient to accurately capture their experiences.

3.10 Logistical and ethical considerations

In conjunction with the overseeing authorities, our proposed plan was submitted to Kenyatta University's postgraduate school for approval. This step was followed by sending it over to KUERC, for an ethical review (Appendix 6.7). Permission from NACOSTI, a necessary component of successfully conducting this research study was also obtained through proper channels (Appendix 6.9).

The study incorporated rigorous ethical measures to ensure participant safety and data integrity. At the community level, approval was required from the local administration including significant gatekeepers. Informed consent was obtained after explaining study goals, confidentiality, and voluntary participation. Privacy was maintained by anonymizing responses, and data security was prioritized. A referral pathway to local counseling services was established for distressed participants, offering them professional support. Research assistants received trauma-informed training, minimizing harm, observing cultural sensitivity and ensuring a non-judgmental, empathetic approach.

3.11 Data collection and analysis

3.11.1 Data collection techniques

The study utilized secondary sources to provide a foundation for the research, gathering information on contextual background, statistical pre-existing data to sexual violence prevalence, concepts and frameworks used to interpret findings, comparative data, and a review of existing policies addressing sexual violence and sanitation. Key information was sourced from peer-reviewed journals, academic books, government publications, and reports by organizations like the World Health Organization (WHO) and Amnesty

International. These sources offered insights into global and regional trends and risk factors associated with sexual violence in areas with limited sanitation. Additionally, they provided theoretical frameworks and methodologies that informed the study's data collection and analysis processes, reinforcing its broader relevance.

A total of 75 secondary sources were extensively examined to ensure a comprehensive literature review. Each source was selected based on relevance, credibility, and publication date, with preference for works published in the last decade. This review highlighted critical research gaps, particularly the limited focus on the links between shared sanitation facilities and sexual violence in informal settlements. Identifying these gaps underscored the need for this study's perspective. Ultimately, the secondary literature provided essential context, informed the survey design, and emphasized the importance of investigating sanitation-related vulnerabilities in under-resourced communities.

Structured questions were selected due to their potential for higher respondent participation rates and ease of coding and analysis. Anonymous self-administered questionnaires were used to minimize social desirability bias (Bergen & Labonté, 2019).

The research commenced with the distribution of permission letters and introduction letters from Kenyatta University to enlighten the participants concerning the reason and justification for this research. Self-administered questionnaires were then provided to respondents, allowing ample time for completion. Due to the sensitive nature of the study sexual violence risks, social desirability bias is bound to occur as respondents provide responses to the self-administered questionnaire. The risk of social desirability was

considered to avoid respondents modifying their responses to appear favorable. To address this, indirect questioning was employed, allowing respondents to comment on general community experiences rather than solely on personal experiences (Vazquez et al., 2021). Furthermore, the questionnaires were carefully designed to avoid leading questions that might shape responses, which helped ensure that answers were authentic (Gower et al., 2022). Research assistants received comprehensive training on interviewing techniques, emphasizing confidentiality and neutrality in conducting interviews. They were carefully selected and prepared to approach sensitive topics in a supportive, non-judgmental manner, ensuring participants felt safe during the process. This training also included techniques to minimize secondary trauma for both participants and interviewers, as the study's "do no harm" principle was emphasized to avoid re-traumatization (Idris, 2021).

Key informant interviews were conducted on persons who hold insights or expertise on issues relevant to sexual violence in informal settlements. Eight key informants were purposively selected and included one person from the following; community leader, local NGO gender officer, sub-county gender officer, youth leader, area chief, health worker, law enforcement officer and teacher. While these individuals may not be representative of the whole population under study, they provided valuable contextual information that supported in interpreting the broader findings. Their insights contributed to an understanding of the community dynamics and issues being examined, aligning them as part of the target population to the extent that their perspectives informed the study's thematic focus.

Two Focus Group Discussions (FGD) were conducted in both Swahili and English as the preferred language by the participants. Each session comprised 8-10 participants who were members of the larger target population and shared relevant experiences or characteristics. The sessions were documented by combining note-taking with audio recording where all tools and data were securely stored. In this context, FGD participants were residents of the Jua Kali informal settlement, particularly those who regularly used shared-sanitation facilities. These individuals represented the target population directly and provided qualitative insights that complemented the quantitative data. Their input offered a nuanced understanding of the challenges related to sanitation access and exposure to risks, enriching the study's findings on sanitation-related sexual violence in informal settlements. Finally, a comprehensive desktop literature review was conducted to establish a descriptive framework concerning shared sanitation and sexual violence.

3.11.2 Data analysis

The research data underwent qualitative data analysis using the triangulation method, and it was subsequently subjected to electronic analysis using SPSS 25.0 (Statistical Package for the Social Sciences). Qualitative data obtained from FGDs and key informants was analyzed along with emerging thematic areas that were obtained from the objectives of the study. The analysis plan was structured per the study objectives. In reference to first objective, descriptive statistics were conducted to calculate the prevalence of sanitation-related sexual violence. Frequency counts and percentages were used to show the proportions of respondents who experienced the incident of sexual violence. Cross tabulations by demographics such as age, gender were employed to discover variations

in in prevalence across different groups. For the second objective, descriptive statistics summarized perceptions of sanitation-related sexual violence, including perceived safety and risk awareness, using a Likert scale. To address the third objective, inferential statistics, including bivariate analysis and chi-square tests, were used to examine associations between specific sanitation factors and reported instances of sexual violence. (Kotronoulas et al., 2023). Additionally, logistic regression analysis was utilized to test the influence of various sanitation factors on the likelihood of experiencing or perceived risk of sexual violence. Patterns that surfaced were illustrated using charts, and tabular representations.

Data gathered from secondary sources was used to enhance and offer theoretical insights for discussion and obtain conclusions in line with the study objectives.

Interviews with primary informants were captured by audio recording, and then perfectly transcribed. In order to analyze the data, an exploratory method was deployed which involved pinpointing major categories as well as repeating patterns found in the transcription until no new concepts appeared. To ensure data quality, the research team underwent fundamental communications skills, and documentation to minimize bias, data duplication, and probabilities for omissions.

CHAPTER FOUR: RESULTS

4.1 Introduction

The chapter provides the outcomes derived from the field. The chapter will be presented in two parts: the first section will focus on quantitative data results based on descriptive and inferential statistics, then the second part that will highlight the qualitative narrative analysis.

4.1.1 Socio-demographic characteristics

Participants in the inquiry ranged from 18 to 68 years old, showcasing a median age of precisely 27.0 years and an average age of 29.45 ± 10.17 . The data revealed that 118 (31.0%) participants fell within the 20-24 age group, while 26 (6.8%) were 50 years and older. The majority, accounting for 196 (51.4%), reported being never married. Of the respondents, 165 (43.3%) were in a marital union at the time of the study, and nearly three-quarters, totaling 268 (70.3%), were female. Concerning religious affiliation, the study found that the majority, 310 (81.4%), identified with Christianity, while a minor proportion, 5 (1.3%), adhered to traditional religion. In terms of education, slightly over half, 193 (50.7%), had completed secondary education, and 41 (10.8%) had achieved tertiary education (Table 4.1).

Table 4.1: Demographic Information of participant from Jua Kali informal settlement

Characteristics		Frequency	Percent
Age group (years) <i>Mean=29.45</i> <i>SD=10.17</i>	15-19	50	13.1
	20-24	118	31.0
	25-29	55	14.4
	30-39	101	26.5
	40-49	31	8.1
	50 years and above	26	6.8
Gender	Male	113	29.7
	Female	268	70.3
Marital status	Single	196	51.4
	Married	165	43.3
	Divorced/separated	20	5.2
Level of Education	Primary	126	33.1
	Secondary	193	50.7
	Post-secondary	41	10.8
	No formal education	21	5.5
Religion affiliation	Muslim	59	15.5
	Christians	310	81.4
	Traditional	5	1.3
	Declined	7	1.8

4.1.1.1 Prevalence of sanitation-related sexual violence

The investigation uncovered that among the entire pool of participants (n=381), 134 individuals, accounting for 35.2%, reported instances of sanitation-related sexual violence as shown in Figure 4.1. Among these cases, 70% (268) were females, while males constituted 30% of the reported incidents. Figure 4.2 on prevalence by gender indicated that 120 (90%) of the respondents who experienced sanitation-related sexual violence were female while 14 (10%) were male.

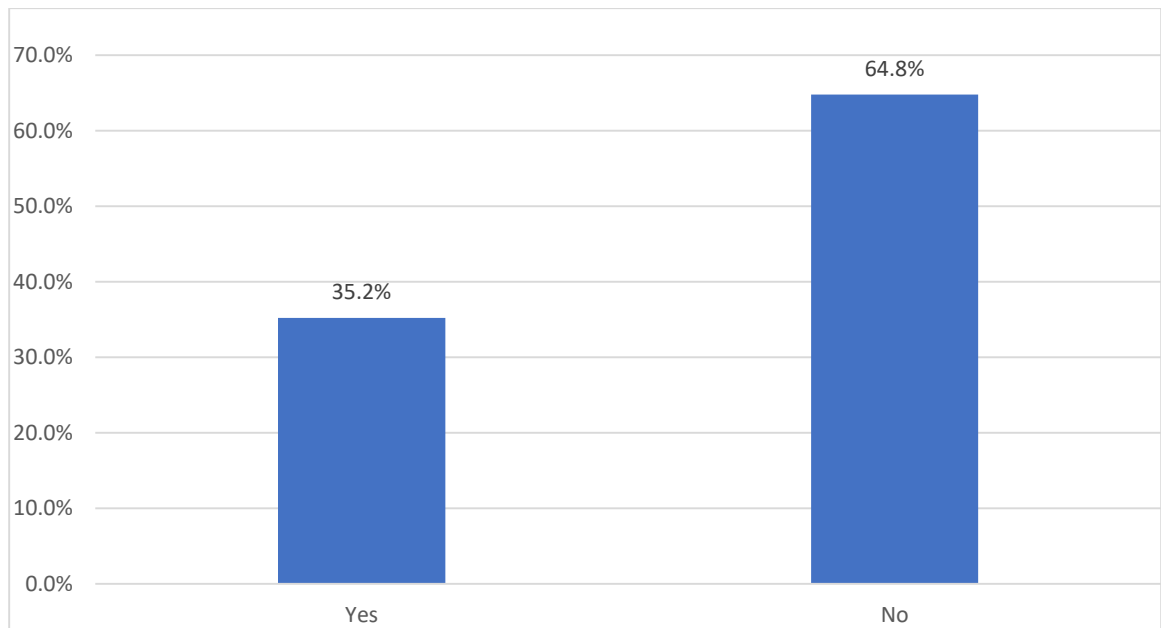


Figure 4.1: Prevalence of Sanitation-Related Sexual Violence in informal settlements

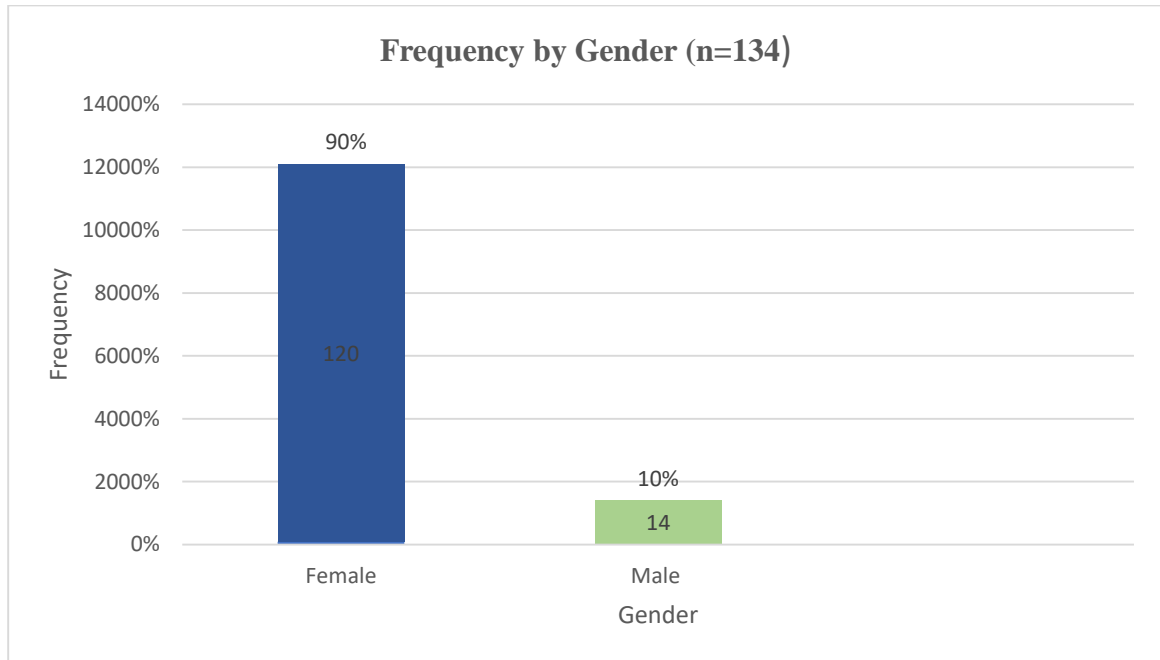


Figure 4.2: Prevalence of Sanitation-Related Sexual Violence by gender in informal settlements

4.1.1.2 Co-occurrences of sanitation-related sexual violence and other forms of non-sexual violence

The study showed that name-calling (30.3%) and causing fear (30.6%) were the most prevalent forms of violence, indicating significant verbal and psychological abuse in the study area. Conversely, inappropriate bodily touching (6.5%) and bullying (0.3%) were less common but still highlight critical concerns regarding individual safety and well-being (Table 4.2).

Table 4.2: Co-occurrences of Sanitation-Related Sexual Violence by type

Forms of violence	Frequency	Percent
Inappropriate bodily touching	20	6.5
Name-calling	94	30.3
Eve- teasing	30	9.7
Bullying	1	0.3
Causing fear	95	30.6
Shame	93	30.0
Molestation	36	11.6
Beating	7	2.3
Fighting	9	2.9
Stalking	24	7.7
Eye balling	1	0.3

4.1.1.3 Socio-demographic factors associated with sanitation-related sexual violence

Out of the interviewees living in Jua Kali, 134 individuals (35.2%) had encountered sexual violence while accessing shared sanitation in the 12 months leading up to the research. A significant proportion of respondents aged 20-24, specifically 53 individuals, representing 39.6% of this age group, reported experiencing sexual violence while utilizing shared sanitation facilities. This was followed by respondents aged 30-39, with 39 cases (29.1%). The respondents aged 15–19 years who had ever experienced sexual violence were 14(10.4%). Upon further scrutiny, it was revealed that individuals aged 20-

24 years had a 3.5-fold higher likelihood of encountering sexual violence associated with sanitation facilities when compared to other age groups. Similarly, individuals in sets of age groups; 25-29, and 30-39 years unveiled a higher probability of experiencing sexual violence in relation to sanitation facilities, with 1.8 times, 1.7 times, and 1.6 times increased likelihood, respectively (Table 4.3). The age group of 20-24 years exhibited a statistically significant link with the experience of sexual violence when utilizing shared sanitation, with an odds ratio of 3.534, a 95% confidence interval ranging from 1.123 to 11.117, and a p-value of 0.031. A larger percentage of female respondents, accounting for 89.6%, reported having experienced sexual violence while accessing shared sanitation, whereas male respondents comprised only 10.4% (Table 4.3). A notable association was observed between gender and the experience of sexual violence while accessing shared sanitation (OR=4.985; 95% CI=0.099-6.370; p= 0.0001). Married participants exhibited a twofold likelihood of experiencing sanitation-related sexual violence (OR= 2.158, 95% CI=0.664-7.012, p= 0.201). Similarly, those with a primary education level were nearly twice as likely to experience sanitation-related sexual violence when compared to other education levels. However, it's worth noting that this difference did not reach statistical significance, with the odds ratio at 1.851 and a wide confidence interval ranging from 0.603 to 5.677. Notably, individuals identifying as Christians among those who experienced sexual violence while accessing shared sanitation facilities exhibited a significantly elevated likelihood, specifically four times higher, of encountering sexual violence related to sanitation use. This statistical association is supported by an Odds Ratio of 3.641, a 95% Confidence Interval ranging from 1.067 to 3.972, and an associated p-value of 0.0001. (Table 4.3).

Table 4.3: Socio-demographic factors associated with sanitation-related sexual violence

		n (%)	OR	95% CI	p-value
Variables					
Age group	15-19 years	14(10.4%)	1.835	0.492-6.848	0.366
	20-24	53(39.6%)	3.534	1.123-11.117	0.031
	25-29	15(11.2%)	1.722	0.503-5.890	0.387
	30-39	39(29.1%)	1.586	0.541-4.648	0.400
	40-49	6(4.5%)	0.697	0.182-2.667	0.598
	Above 50 years	7(5.2%)	Ref		
Gender	Male	14(10.4%)	Ref		
	Female	120(89.6%)	4.985	0.099-6.370	0.0001
Marital status	Single	59(44.0%)	1.598	0.469-5.447	0.454
	Married	70(52.2%)	2.158	0.664-7.012	0.201
	Divorced / separated	5(3.7%)	Ref		
Level of Education	Primary	67(50.0%)	1.851	0.603-5.677	0.282
	Secondary	53(39.6%)	0.702	0.218-2.254	0.552
	Post-secondary	8(6.0%)	0.514	0.136-1.941	0.326
	No formal education	6(4.5%)	Ref		
Religion affiliation	Muslim	29(21.6%)	Ref		
	Christians	105(78.4%)	3.641	1.067-3.972	0.0001

4.1.1.4 Perpetrators of sexual violence

Out of the respondents, a significant majority of 102 (76.1%) reported experiencing sexual violence perpetrated by individuals known to them. A statistically significant relationship was observed between the experience of sexual violence while accessing shared sanitation facilities and being violated by someone known to the respondents ($\chi^2=372.383$, $df=1$, $p=0.0001$). Among the perpetrators, acquaintances accounted for the largest portion at 55 (41.0%), followed by neighbors at 36 (26.9%), and strangers at 32 (23.9%) (Table 4.4). Moreover, there happened to be a meaningful statistical correlation between the incidents of sexual assault when using communal sanitation amenities and the identity of one carrying out such an act ($\chi^2=372.383$, $df=4$, $p=0.0001$). Qualitative insights gathered from focus group discussions indicated that women and girls faced a heightened susceptibility to incidents of sexual abuse when they were engaged in the task of fetching water from communal water sources within the community.

“Men touch us on the private parts [breasts and buttocks] as we fetch water and this makes us feel very bad. If our husbands and boyfriends see this, they may think we are misbehaving. This is very stressful to us”. A discussant during FGD session.

Table 4.4: Perpetrators of sexual violence and the relationship with the survivors

Perpetrator		Frequency	Percent	Significance
Perpetrator known	Yes	102	76.1	$\chi^2= 372.383,$ df=1 p=0.0001
	No	32	23.9	
Relationship with the perpetrator	Uncle	8	6.0	p= 0.0001
	Cousin	3	2.2	
	Acquaintance	55	41.0	
	Stranger	32	23.9	
	Neighbor	36	26.9	

4.1.2 Perceptions of sexual violence associated with sanitation facilities

4.1.2.1 Dealing with the occurrence of sexual violence

The study's results highlighted those 102 individuals, making up 33.0% of the entire respondent pool, expressed their willingness to actively intervene when faced with incidents of sexual violence during shared sanitation facility use. Moreover, they indicated their intent to report such incidents to the police individually. Importantly, the analysis revealed a statistically significant connection between the experience of sexual violence while accessing shared sanitation and the subsequent actions taken by individuals in response to these incidents (p-value = 0.003) (Table 4.5).

Table 4.5: Interventions by survivors during episodes of abuse

Variables	Experienced sexual violence		p-value
	Yes	No	
Intervene during the episode	102(33.0%) 33.0%	207(67.0%) 67.0%	0.003
Speak to your friend after the episode	28(43.1%) 43.1%	37(56.9%) 56.9%	
Report to the police	112(33.8%) 33.8%	219(66.2%) 66.2%	
Do nothing, it is taboo to tell others	8(72.7%) 72.7%	3(27.3%) 27.3%	

4.1.2.2 Reporting of sexual violence

Half of the respondents 68 (50.7%) reported the case to the authority while almost half 47.8% didn't report the cases as shown in Figure 4.3 below.

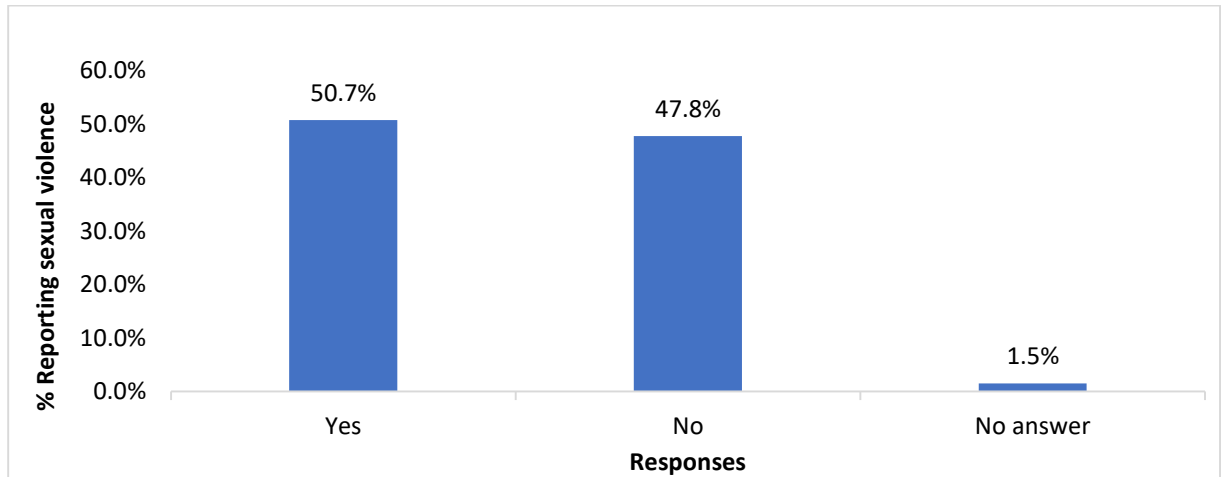


Figure 4.3: Percentage of survivors who reported sexual violence

Roughly 12% of the participants who encountered sexual abuse indicated that the perpetrator had been apprehended, while 5.2% (5.2%) noted that the legal proceedings for their cases were still ongoing in court. The bond displayed here holds substantial statistical relevance, verified by a p-value of 0.0001 (Table 4.6).

Table 4.6: Actions against perpetrators of sanitation-relate sexual violence in Jua Kali informal settlement

Variables	Frequency	Percent	p-value
Perpetrator was arrested	16	11.9%	
case in court	7	5.2%	
Authorities did not act	44	32.8%	0.0001
No answer	58	43.3%	
Not available	9	6.7%	

4.1.2.3 Challenging the behavior of sanitation-related sexual violence

Among the 134 respondents who reported experiencing sexual violence, 49 (36.5%) expressed a willingness to confront or question the perpetrator's behavior. Additionally, 51 (38%) had already taken the step of reporting the incident, while 30 (22.3%) indicated that they were not inclined to challenge the behavior. A small percentage, 2 (1.5%), did not respond, and another 1.5% remained non-committal in their response. (Table 4.7).

Table 4.7: Addressing behavioral challenges in sanitation-related sexual violence

		Yes, I would	Yes, I have already	No	No answer	Total
Ever experienced sexual violence while accessing shared sanitation in the last 12 months	No	207	7	11	22	247
	Yes	49	51	30	4	134
	Total	256	58	41	26	381

During a focus group discussion, a discussant noted; *“I don’t entertain nonsense and I cannot allow a stranger to touch me. I see how the call names as you go to the toilet and that is not good. So, I shout back and tell them what they are doing to other girls and women is not good”*.

4.1.2.4 Questioning the perpetrator's behavior

Individuals in the age brackets of 30-39 and 40-49 years demonstrated a higher likelihood of questioning the actions of the perpetrators. Specifically, individuals in the age bracket of 30-39 years age were three times as likely, while those in the 40-49 years age group were twice as likely. Men were approximately 1.5 times more inclined to take this action. (Table 4.8). A discussant in the focus group discussion said; *“I believe that if all of us in our village speak up when these young idle men are abusing us, they will stop and start respecting us”*.

Table 4.8: Analysis of perpetrators behavior by age and gender

		OR	Df	p-value	95% CI	
					Lower Bound	Upper Bound
Age	15-19 years	0.058	1	0.810	0.332	4.105
	20-24	0.255	1	0.613	0.438	4.044
	25-29	0.000	1	0.994	0.304	3.254
	30-39	3.384	1	0.066	0.932	9.316
	40-49	2.475	1	0.116	0.745	14.705
	Above 50 years	Ref	0	.	.	.
Gender	Male	1.411	1	0.235	0.776	2.816
	Female	Ref	0	.	.	.

4.1.2.5 Attitude toward sanitation-related sexual violence

Respondents who reported a history of experiencing sexual violence and expressed agreement with the notion that women who reject sexual advances should be coerced into sex were found to have a threefold higher likelihood of being sexually violated. Similarly, interviewees who believed that most sexual offenses were perpetrated by individuals known to them were twice as likely to experience sexual violence. In terms of gender, females faced a significantly higher risk, with a 36-fold increased likelihood of experiencing sexual violence, and this association with sexual abuse was found to be statistically meaningful (Odds Ratio = 35.810; 95% Confidence Interval = 1.921-6.674; p-value = 0.017). (Table 4.9).

Respondents who expressed fear of using a shared sanitation facility were found to be at a fivefold increased vulnerability of experiencing sexual violence. This finding was highly significant from a statistical standpoint, with an Odds Ratio of 5.011, and 95% Confidence Interval ranging from 0.001 to 0.210, and a p-value of 0.003. Furthermore, respondents who agreed that female community members refrained from using shared sanitation facilities due to fear of sexual violence were found to have a twofold increase in the likelihood of encountering such incidents, demonstrating a highly significant statistical relationship, with an Odds Ratio of 2.319, a 95% Confidence Interval ranging from 0.106 to 0.959, and an associated p-value of 0.0001 (Table 4.9).

Table 4.9: Regression analysis of attitudes towards sanitation-related sexual violence

		OR	Lower Bound	95% CI Upper Bound	p-value
Women decline sexual advancements	Agree	2.836	0.206	12.557	0.162
	Disagree	19.655	0.138	2.801	0.239
	Don't know	Ref			
Sexual offences committed by someone known	Agree	2.020	0.606	6.735	0.252
	Disagree	1.889	0.474	7.526	0.367
	Don't know	Ref			
Female community members most vulnerable	Agree	35.810	1.921	6.674	0.017
	Disagree	4.022	0.551	29.345	0.170
	Neutral	Ref			
Fear using shared sanitation	Agree	5.011	0.001	0.210	0.003
	Disagree	0.272	0.067	1.096	0.067
	Neutral	Ref			
Female don't utilize shared sanitation	Agree	2.319	0.106	0.959	0.0001
	Disagree	1.100	0.047	0.215	0.042
	Neutral	Ref			

4.1.2.6 Attitude toward safety within shared sanitation

The study findings indicated that respondents who had adequate lighting at the shared sanitation facilities were twice as likely to experience incidents of sexual abuse. Additionally, participants who held opposing views, indicating a lack of belief in the necessity for women and girls to have companions when using shared sanitation facilities at night and the obligation for a woman to report non-consensual sexual incidents to the authorities, were discovered to be at twice, eight times, and 1.2 times higher risk of encountering such abuses. Notably, these factors demonstrated statistically significant

correlations with sanitation-related violence, depicting p-values of 0.046, 0.031, and 0.0001, respectively (Table 4.10).

Table 4.10: Regression analysis of attitudes toward safety in shared sanitation facilities

		OR	95% CI		p-value
			Lower Bound	Upper Bound	
Adequate lighting increases vulnerability	Agree	1.575	0.032	0.966	0.046
	Disagree	0.438	0.085	1.887	0.997
	Neutral	Ref			
Female require escort	Agree	0.144	0.149	3.754	0.997
	Disagree	7.716	1.208	9.294	0.031
	Neutral	Ref			
Report if forced to have sex	Agree	2.708	0.253	9.007	0.410
	Disagree	1.219	2.734	10.790	0.0001
	Neutral	Ref			
Not to touch inappropriately	Agree	0.157	0.010	2.572	0.194
	Disagree	2.273	1.783	3.689	0.342
	Neutral	Ref			
Female must submit	Agree	2.232	0.582	8.565	0.242
	Disagree	0.623	0.077	5.021	0.657
	Neutral	Ref			
Leaders understand sanitation need	Agree	2.660	0.703	10.073	0.150
	Disagree	1.744	0.287	10.581	0.546
	Neutral	Ref			
Males not sexually violated	Agree	0.976	0.412	2.311	0.955
	Disagree	0.769	0.384	1.543	0.460
	Neutral	Ref			
Separate sanitation	Agree	0.983	0.177	5.475	0.985
	Disagree	4.552	0.352	58.906	0.246
	Neutral	Ref			
Ask for help	Agree	0.451	0.015	13.498	0.646
	Disagree	0.063	0.003	1.436	0.083
	Neutral	Ref			

4.1.3 Sanitation factors contributing to sanitation-related sexual violence

The findings of this study indicate that 124 (92.5%) of the respondents faced an increased vulnerability to sexual violence when they had to cover long distances (more than 50 meters) to access a toilet facility in the region ($\chi^2=5.471$; df 1; $p=0.030$). Furthermore, an overwhelming majority of 127 (94.8%) respondents expressed concerns about the safety of shared sanitation facilities ($\chi^2=43.747$; df 1; $p=0.0001$). The study also unveiled those 129 (96.3%) respondents considered water points to be unsafe ($\chi^2 =11.782$; df 1; $p=0.0001$). Moreover, 122 (91.0%) of the study participants noted the absence of locks on the inside of latrines and shower blocks, while 129 (96.3%) reported the absence of separate toilets or bathrooms (Table 4.11).

Table 4.11: Sanitation factors contributing to sanitation-related sexual violence

Sanitation factors		Experienced sexual violence		Significance
		Yes	No	
Long distances of more than 50 meters	Disagree	10(7.5%)	6(2.4%)	$\chi^2 = 5.471$; df 1; p=0.030
	Agree	124(92.5%)	241(97.6%)	
Safe	Not safe	127(94.8%)	158(64.0%)	$\chi^2 = 43.747$; df 1; p=0.0001
	Very safe	7(5.2%)	89(36.0%)	
Water points at a safe place	No	129(96.3%)	209(84.6%)	$\chi^2 = 11.782$; df 1; p=0.0001
	Yes	5(3.7%)	38(15.4%)	
Toilets/bathrooms are separate	No	129(96.3%)	222(89.9%)	$\chi^2 = 4.890$; df 1; p=0.028
	Yes	5(3.7%)	25(10.1%)	
Latrines and shower blocks have locks on the inside	No	122(91.0%)	239(96.8%)	$\chi^2 = 5.707$; df 1; p=0.028
	Yes	12(9.0%)	8(3.2%)	
Sanitation facilities are central	No	118(88.1%)	240(97.2%)	$\chi^2 = 12.700$; df 1; p=0.001
	Yes	16(11.9%)	7(2.8%)	
Sanitation facilities well lit	No	118(88.1%)	239(96.8%)	$\chi^2 = 11.144$; df 1; p=0.001
	Yes	16(11.9%)	8(3.2%)	

4.2 Qualitative narrative analysis

This section presents the qualitative findings from key informant interviews (KIIs) with community leaders, health professionals, and residents of the Jua Kali informal settlement. Findings are organized to correspond with the study objectives: the prevalence of sanitation-related sexual violence, adult residents' perceptions of sanitation-related sexual violence, and sanitation-related factors that contribute to this violence.

4.2.1 Prevalence of sanitation-related sexual violence

The prevalence of sexual violence at sanitation facilities has been identified as an important problem in the community. Respondents mentioned the varying frequency of reported cases, emphasizing that many incidents go unreported because of social stigma and fear of reprisal.

Regarding the frequency of incidents, one respondent observed that cases were reported “*once or twice a month,*” though they noted that this could possibly underestimated the true prevalence. Another respondent stated, “*Reports are infrequent, but that does not mean the violence does not happen, the community members do not report.*” Seasonal variations were also observed, with one informant explaining that “*during water shortages, harassment at water points increases.*”

Specific areas with a high risk of sanitation-related violence have also been recognized. Toilets situated far away from dwellings or in secluded areas were described as particularly dangerous, based on a community leader. “*Toilets far from homes or in isolated areas are the most dangerous.*”. Furthermore, several respondents noted shared facilities which lack proper gender segregation as particularly risky.

4.2.2 Perceptions of adult residents regarding sanitation-related sexual violence

Adult residents had a range of perspectives on the risks associated with accessing sanitation facilities. These perceptions have been influenced by deep-seated fears, community norms, and different perspectives on sexual violence.

When asked to define sexual violence, respondents broadly described it as any act that violates a person sexually. One respondent explained, *“It includes actions that harm a person sexually, physically, many times verbal abuse. Many perpetrators cause psychological abuse.”* Another added, *“specifically in our village, it includes being stalked or harassed while trying to access the toilet facilities, where everyone shares the same.”*

Key informants identified various forms of sexual violence. According to one community elder, the most common forms are harassment, catcalling, and stalking. Severe cases, including rape near poorly lit toilets, were also reported. Male victims were rarely mentioned, though incidents of harassment and luring by older women were reported.

The implications for these violations were severe. Victims frequently encountered physical injuries, unintended pregnancies, and infections. A healthcare worker observed, *“Victims mainly present with physical injuries, unwanted pregnancies, or infections.”* Psychological effects were equally significant, as one respondent mentioned, *“People feel unsafe even in their own community, such that they fear using the toilets.”* Community response in the event of abuse varied, and most victims remained silent during the attacks. As one respondent explained, *“Some try to confront the perpetrators directly, but this can escalate tensions.”*

4.2.3 Sanitation-related factors contributing to sexual violence

Problems with sanitation facilities and contextual vulnerabilities were identified as significant contributors to sexual violence risks. Key challenges comprised poor design, distant location, and minimally maintained sanitation facilities. One resident noted, *“The*

toilets are too far from homes, making it unsafe to access them, especially for women and children.” Inadequate lighting around toilets was also a recurring theme, with a community leader emphasizing, *“There’s no proper lighting around the toilets or water points.”* Broken locks on shared facilities further exacerbated the risks, as highlighted by another informant: *“The locks on many shared facilities are broken, leaving users exposed to acts of sexual abuse.”*

Certain times of day were identified as risk. Nighttime was frequently cited as the most dangerous time owing to inadequate lighting and minimal activity. One respondent remarked, *“Nighttime is the riskiest because of the darkness and the lack of people around.”* Early morning hours were also identified as a high-risk time for abuse.

Informants made several suggestions for minimizing these risks. A community leader proposed, *“Installing proper lighting near sanitation facilities would make them safe.”* Ensuring functional locks and gender-segregated toilets were also emphasized by a health professional, who stated, *“Ensuring that toilets have functional locks and are gender-segregated is essential.”* Community policing and the establishment of surveillance teams were recommended as additional measures to discourage perpetrators and improve community safety.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, we delve into the findings obtained in the course of this research and establish connections with relevant literature from comparable studies conducted on a global, regional, and local scale. This section provides a detailed examination of how the outcomes of the research compare and contrast with the findings of similar studies conducted in other contexts. The chapter summarizes the key findings, highlights the implication, and draw conclusions derived from the research results. Lastly, the chapter delineates recommendations and proposes areas for future research in the field.

5.2 Discussion

5.2.1 Prevalence of sanitation-related sexual violence

The research showed that out of 381 respondents, 134 individuals, or 35.2%, reported experiencing sanitation-related sexual violence. This is a substantial portion of the population, highlighting that over one-third of the respondents are affected by this issue. This gender breakdown shows women are disproportionately affected by sanitation related Sexual Violence, as they make up the vast majority of victims. Although men also experience this form of violence, women face a much higher risk.

Gender-related findings further emphasize the disparity in experiences of sexual violence. Among female respondents, a substantial 70% (268) reported encountering sexual violence in shared sanitation facilities, compared to only 30% (113) of male respondents.

This stark contrast illustrates the significantly higher risk faced by women in such environments. The higher prevalence reported in this study may indicate that the respondents were comfortable disclosing sensitive information, possibly due to the confidentiality measures implemented during data collection which helped to reduce social desirability bias. These results suggest an urgent need for interventions that prioritize the safety of women and young adults in shared sanitation contexts, addressing both age and gender as key determinants of risk in these settings.

The results of this investigation align with global statistics, as indicated by Action Aid in 2013, which reported that approximately one out of every three women in their reproductive years had encountered instances of sexual violence.

The data shows that 90% (120) of respondents who experienced sanitation-related sexual violence were female, while 10% (14) were male. This is significantly higher than the national averages reported in the KDHS 2022, where 13% of women and 7% of men reported experiencing sexual violence. This suggests that sanitation-related violence disproportionately affects women. A report on creating safe urban environments in Delhi revealed that 10.1% of reported cases involved rape and sexual assault, while approximately 44% of women and 40% of men cited a lack of clean, safe toilets as a factor contributing to insecurity (Jagori & UNWOMEN, 2010).

House et al. (2014) observed that women and girls faced a heightened susceptibility to abuse in the process of accessing sanitation and water. More than 83% of households from Mathare informal settlements in Kenya reported inadequate privacy when using a bathroom. Evidence suggests that most of the women reported experiencing violence

(Winter et al., 2023). Findings of the research conducted in Haiti indicated that 40% of the participants expressed concerns about the safety of women and children during bathing, and nearly half of them had reservations regarding the safety of women and children using public toilet facilities (Van der Gaag, 2013). A report by Medicins Sans Frontiers (MSF) indicated that almost 82% of women were raped while accessing daily sanitation facilities. This study has shown a high proportion of women (89.6%) undergo sexual violence while accessing shared sanitation facilities. This aligns with research conducted in India within informal settlements among Dalit women in informal settlements which revealed how they face sexual harassment by not having toilets within their premises (Sommer et al., 2015).

In this study, respondents' ages ranged from 18 to 68 years, with a median age of 27.0 years and a mean age of 29.45 years. The age distribution indicated that 31.0% (118) respondents were between 20 and 24 years, while 6.8% (26) respondents were 50 years or older. Gender representation showed that nearly three-quarters of the respondents were women, with 70.3% (268) respondents identifying as female and 29.7% (113) respondents as male.

Marital status data revealed that 51.4% (196) respondents were never married, and 43.3% (165) residents were in a marital union. In terms of education, slightly more than half (50.7% or 193) respondents had completed secondary education, while 10.8% (41) respondents had attained tertiary education. The majority of respondents (81.4% or 310) respondents identified with Christianity, while a small proportion (1.3% or 5) respondents reported adherence to traditional religions.

The analysis of age-related data revealed that respondents aged 20-24 years exhibited the highest prevalence of sexual violence incidents in shared sanitation settings, with 39.6% (53) respondents reporting such experiences. This notable figure suggests that younger individuals, especially those in their early twenties, face heightened vulnerability to sexual violence in communal sanitation environments. The second most affected group was the 30-39 age bracket, where 29.1% (39) respondents reported similar experiences. While this percentage is lower than that for the 20-24 age group, it underscores a significant level of risk within this age range as well.

A statistical analysis demonstrated a strong association between the 20-24 age group and experiences of sexual violence, with an odds ratio (OR) of 3.534. This statistic indicates that individuals within this age group are approximately 3.5 times more likely to encounter sexual violence in shared sanitation facilities compared to older age groups. These findings highlight age as a critical factor in determining vulnerability within informal settlement settings.

In this study, it was observed that a significant majority of 102 (76.1%) of the respondents had experienced sexual violations perpetrated by individuals known to them. These findings align with results from prior research. Amnesty International (Amnesty International, 2010) reported that 75% of perpetrators were acquainted with the victims, which often included neighbors and friends within the community. The majority of sexual violence incidents are perpetrated by men, (ABS,2023) with most offenders being known to the survivors (Aceves & Tarzia, 2024). This study's findings further corroborate these patterns, with acquaintances (41%) and neighbors (26.9%) being identified as

among the perpetrators of sexual violence against respondents accessing sanitation facilities.

The findings concerning the timing and frequency of violent occurrences in this study align with Jagori's research (2010). Among the respondents who experienced violations, 26.1% reported that the abuses occurred during the day/evening, while 20.1% indicated that they occurred exclusively in the evenings. These findings underscore a notable correlation between the time of incidence and the nature of the violation. Jagori's study (2010) found that three out of every resident experienced sexual abuse throughout both the day (41%) and the night (36%), with 23% facing violence during both periods. Additionally, 6% of individuals felt secure when using sanitation facilities during daylight hours (Davoren, 2012). In a separate study conducted in Zatari, Jordan, half of the respondents (comprising 978 families) expressed fear of using latrines at night (Turnbull, 2015). Furthermore, the present study highlights a significant weekly occurrence rate of 35%.

5.2.2 Perceptions of sexual violence

When questioned about their responses to incidents of violence, more than 50% of the participants who had encountered sexual violence while accessing shared sanitation facilities indicated that they would intervene when such violence occurred. It's important to note that there is a significant lack of research that delves into the responses and behaviors of individuals who have experienced such incidents. House et al. (2014) identified challenges in reporting violence and sanitation-related behaviors, citing ethical concerns that complicate the use of randomized trials to test interventions in this context.

However, this study revealed that some community members would opt not to take any action because speaking out is regarded as taboo. This aligns with the findings of Costa et al. (2019), which highlight the highly stigmatized nature of sexual violence. It is often perceived as a family or community issue, leading survivors to refrain from reporting incidents due to the psychological distress it may cause. Evidence from this study now shows that 50.7% of the respondents who experienced sexual violence while accessing shared sanitation facilities reported the incidence of someone, an agency, and authorities within the community. This aligns with the results obtained by Palermo et al. (2014) where findings indicated that 40% of women who experienced sexual violence confided in someone they knew, whereas 7% reported the incidents to an official authority such as a police station. Evidence shows that there is a tendency for cases to go unreported and for individuals not to seek assistance (Palermo, Bleck, & Peterman, 2014a).

Nevertheless, 43.3% of those who lodged reports stated that the authorities failed to take any action, while 11.9% of the perpetrators were reported to have been arrested for legal prosecution. Women in public spaces in Ethiopia, Nepal, and Liberia encounter sexual harassment and a lack of safety, often attributed to inadequate police responses within their communities (Amnesty International, 2011).

Available evidence suggests that survivors of sexual violence often refrain from reporting their experiences due to feelings of shame and stigma, a lack of awareness regarding available support services for addressing such violence, and a perception among survivors that such violence is commonplace and should not be reported (Contreras, Bott, Guedes, & Dartnall, 2010). The concept of 'toilet insecurity,' as defined by Humanitarian

Innovation Fund et al., (2018) aims to elucidate a situation in which women and girls are incapable of seeking support or sharing their experiences when such incidents occur.

This found that female community members do not use the shared sanitation facilities due to fear of sexual violence. This could be attributed to a lack of guardianship to escort vulnerable persons to access the shared sanitation facilities at night hours. Although the evidence provided by this research indicate that the majority of respondents are of the view that adequate lighting does not contribute to vulnerabilities of sexual abuse, other studies have demonstrated an increased risk of violation with poor lighting in shared sanitation facilities (Wado et al., 2020). Evidence indicates that insufficient lighting contributes to sexual violence in slums in Nigeria and Uganda (Humanitarian Innovation Fund, et al., 2018). Additionally, poor lighting around toilets in informal settlements heightens insecurity for the residents, often driving them to resort to open defecation. Over 90% of people in Dharavi and 72% in Nehru Nagar believe that enhancing the lighting around public toilets would enhance their safety (Belur, Parikh, Daruwalla, Joshi, & Fernandes, 2017).

The research discovered that 96.3% of the participants, felt the need for an escort when accessing shared sanitation facilities during the nighttime. These findings are consistent with the outcomes of other research endeavors aimed at evaluating the necessity of guardianship while using shared sanitation facilities in informal settlements. According to House et al. (2014), the absence of guardianship has been recognized as a factor that contributes to the vulnerability of women and girls when accessing shared sanitation facilities in such settings.

This study uncovered that three-quarters of the respondents who had previously experienced sexual violence displayed a willingness to question or challenge the perpetrator's behavior. Moreover, the study revealed that 61.2% of those who had encountered sexual violence expressed a readiness to challenge the actions of the perpetrators. They cited a lack of awareness (11.2%) and fear of retaliation (7%) as the primary challenges in putting an end to these violations. Notably, the study found that men who experienced sexual violence and fell within the age groups of 30-39 and 40-49 were more inclined to raise inquiries about these incidents. These findings agree with those of other studies conducted in various regions. For instance, evidence suggests that over 70% of women were vocal in protesting sexual harassment while accessing sanitation facilities in nine districts of Delhi (Jagori, 2010).

Further results suggest that women accounting for 94.8% are at a higher risk of encountering sexual violence when compared to men. Sharma et al. (2015) contends that, for certain women, utilizing communal sanitation facilities requires careful consideration. They further assert that the absence of female attendants overseeing shared sanitation facilities contributes to safety concerns, particularly during bathing.

When questioned about their perceptions of accessing shared sanitation facilities, a significant 92% of the respondents expressed fear when visiting these facilities, with the majority being female respondents at 78.4%. These findings align with the outcomes of focus group discussions (FGDs) conducted among women residing in three informal settlements located in the northeastern part of Delhi, as reported by Lennon (2011). The

fears primarily revolve around concerns about the presence of boys and drug addicts who frequently loiter around the sanitation facilities in those areas (Lennon, 2011).

Sharma et al. (2015) argues that the placement of bathrooms and toilets behind settlements and adjacent to barren areas amplifies feelings of insecurity among women. This, in turn, raises concerns that during attacks, there may be no assistance available to the victims. Consequently, many women opt for Open Defecation (OD) sites in nearby fields instead of risking the use of shared sanitation facilities (Sharma, Aasaavari, & Anand, 2015).

Despite the relatively low proportion of respondents (26.9%) who disagreed with the notion that men cannot be violated while accessing shared sanitation facilities, House et al. (2014) suggest that conventional societal norms and stereotypes associate fetching water with shame and being perceived as 'unmanly' for men. This portrayal often leads to men being perceived as 'lesser' and 'submissive,' resulting in psychological abuse from their male peers.

In contradiction to the results of this research, which suggest that community and political leaders have an understanding of the security-related sanitation needs, Lennon (2011) argues that women harbored resentment towards their local politicians, whom they viewed as unsupportive. According to discussions within this study, participants claimed that politicians and ward administrators frequently make "hollow promises" regarding the enhancement of sanitary facilities. This disparity highlights the differences between the qualitative and quantitative information collected.

More significant findings of this study show that 95.5% of the respondents would prefer gender-disaggregated sanitation facilities that are clean, lockable, and well-lit. Jagori and UN Women (2010) assert that cities (informal settlements) services are delivered without taking care of women's needs. They state that in responses that consider gender exacerbate the disparities experienced by women include sexual violence while accessing shared sanitation facilities. Ombija et al. (2024) note that the Deep-seated cultural restrictions related to the act of excretion and menstruation in humanitarian settings (informal settlements) coupled with Insufficient toilet and bathing facilities that lack gender separation and privacy for women and girls could result in incidents of sexual violence when they are forced to look for alternative locations for defecation in poorly lit areas.

5.2.3 Sanitation factors that contribute to sanitation-related sexual violence

The study revealed that a significant majority, accounting for 92.5% of the respondents, concurred that accessing a shared sanitation facility at distances exceeding 50 meters in the region significantly heightens the likelihood of sexual violence, as indicated by the statistically significant chi-square dependency. This aligns with a study conducted by Hulland (2015), which found that extended distances to sanitation facilities pose a risk factor for sexual violence

Challenges related to geographical access to the sanitation hardware are depicted by distances from the house to the latrine as indicated by the study. It can take an informal settlement dweller 10 minutes to walk from the home to the shared facility, which is often a dangerous journey for the women particularly at night.

Lack of safety in sanitation was strongly associated with sexual violence. Research undertaken by Amnesty International (2011) in the informal settlements of Honiara in the Solomon Islands affirms that several women were assaulted while bathing and consequently violated sexually. Due to lack of or minimal shared sanitation facilities, women and girls result to relieving themselves in the bushes and streams near their home settlements.

5.3 Conclusions

- i. The study's results indicated that the prevalence of sanitation-related sexual violence in the Jua Kali informal settlement in Nairobi County stands at 35.2%, significantly higher than the national and county prevalence rates of 13% and 12%, respectively, as reported in the national demographic Survey, (KDHS, 2022).
- ii. A significant 89% of the respondents expressed a lack of awareness regarding how to confront instances of sanitation-related sexual violence. The study unveiled a noteworthy correlation between the timing of these incidents and the occurrence of sexual violence when using shared sanitary facilities.
- iii. Residents in informal urban areas are at a heightened vulnerability to sexual violence when they must travel long distances to access shared sanitation facilities. The absence of locks in latrines and shower blocks, as well as the lack of gender-disaggregated toilets and bathrooms, showed a robust association with incidents of sexual violence.

5.4 Recommendations

The recommendations were tailored to meet the needs of its primary consumers in line with the derived conclusions in this study. The county government is the main intended audience, as they are expected to utilize the findings most directly. Other key stakeholders include public health academicians interested in the link between sexual violence and sanitation, the Department of Gender, and organizations involved in gender-based violence (GBV) prevention and response. These groups can benefit from the study's insights, using them to shape policies and design interventions aimed at addressing these pressing issues effectively.

5.4.1 Recommendations from the study

- i. The stakeholders, including, built environment and Urban planning sector in the County government, and development partners, should carry out a comprehensive analysis and safety evaluation to acquire an in-depth understanding of the factors contributing to sexual violence associated with access to shared sanitation facilities.
- ii. The stakeholders, including gender and public health sector in the County government, and development partners should conduct a comprehensive, community-based awareness and education program on sexual violence prevention, targeting informal settlement residents, with a focus on promoting safety and self-defense strategies while accessing sanitation facilities.
- iii. Stakeholders, including policy makers, and relevant NGOs should establish a community-based program to improve sanitation infrastructure in informal

settlements. This program should aim to reduce the distance to shared sanitation facilities, ensure secure locks are installed in latrines and shower blocks, and provide gender-segregated toilets and bathrooms.

5.4.2 Recommendations for further study

- i. To reduce desirability bias, future studies should consider using alternative data collection methods such as anonymous digital surveys, longitudinal studies, or mixed-method studies.
- ii. Conduct a study to evaluate gender mainstreaming measures into urban sanitation policies and how they influence sexual violence prevalence overtime
- iii. Investigate the broader public health implications of sanitation-related sexual violence, including mental health, reproductive health and HIV vulnerability among survivors in informal settlements.

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APPENDICES

Appendix I: Map of Kenya showing Jua Kali informal settlement



Appendix II: Consent

STUDY TITLE: Sexual violence risks associated with shared sanitation facilities in informal settlements, Nairobi City County, Kenya

PARTICIPATION INFORMATION

My name is MWANGI MICHAEL GAITHO a graduate student at Kenyatta University taking a Master's program in Environmental Health. I invite you to take part in this research study designed to evaluate the *Sexual violence risks associated with shared Sanitation facilities in informal settlements, Nairobi City County, Kenya.*

Opting to participate will make you one of the roughly 381 persons who will be a part of this study. Hence, I humbly urge that you dedicate about 15-20 minutes for completion of this survey. Nonetheless, it is important that you understand these underlying guidelines applicable equally to everybody involved in our research;

1. Participation in this is wholly voluntary, and your privacy during the discussion as well as thereafter is fully guaranteed.
2. Participating in this research does not include any financial or tangible rewards meaning it doesn't cost you anything to participate, but will contribute greatly towards this study.
3. Either the investigator or their aid might inquire about your thoughts on the subject of exploration.
4. There's a chance you could find some queries unsettling to respond too. To alleviate such discomfort, exercise superintendency over whether or not to tackle

any chosen query, as well as opting out from this observation altogether if that feels right for you

- 5. Participating in this research poses no tangible threats, yet as we'll be seeking your views on diverse topics, the information regarding your identity shall remain concealed meticulously. All collected data will be stowed securely within a tightly locked filing system- accessible exclusively by the Main Investigator (PI) and their aide.

Statement of participation

I acknowledge that my involvement in this study is optional, and I can decline to participate or retract my consent at any point without facing any consequences.

I hereby freely consent to take part in the study

Signature _____ **Date** _____

Questionnaire Number: [][][][][]

County: _____

Sub-County _____

Division: _____

Location _____ Village _____

Date: Day [][] **Month** [][] **Year** [][][][]

Interviewer Name

[_____]

Supervisor's Signature:

If you have any inquiries about this research

Mwangi, Michael Gaitho

Mobile number 0722685594

Msc. Environmental Health student,

School of public health,

Kenyatta University

Or

Chairperson

Ethics and Review Committee,

Dr. Titus Kahiga,

Mobile number 0720917797

Appendix III: Questionnaire guide

NO	QUESTION	CODING
<p>DEMOGRAPHIC DATA</p> <p>Let me start by asking you about your background....</p>		
1a)	What is your age?	<input type="checkbox"/> <input type="checkbox"/> Years <input type="checkbox"/> Don't know
1b)	Gender	1. Male 2. Female
2	What is your religious affiliation	1=Muslim 2=Roman Catholic 3=Protestant 4=Traditional religion 5=Other (Specify).....
3	What is your present relationship status?	1=Single/never married 2=Married 3=Divorced/separated 4=Widowed
4	Have you ever attended school?	1=Yes 2= No 3=Not Applicable

5	What is the highest educational level you have achieved?	0=Pre-School 1=Primary 2=Secondary 3=University 4=Postgraduate 5=Don't Know 6=Other 7=None 8=Not Applicable
6	Specify the level of educational accomplishment your partner has achieved?	0=Pre-School 1=Primary 2=Secondary 3=University 4=Postgraduate 5=Don't know 6=None 7=Other (Specify)..... 8=Not Applicable
Prevalence of sanitation-related sexual violence		
7	Have you ever experienced sexual violence	1. Yes 2. No

	(rape/attempted rape/ gang rape/ defilement) while accessing shared sanitation in the last 12 months (<i>use of force, without consent, use of violence, use of excessive power</i>)	
8	If yes, have you experienced any other form (s) of violation while accessing shared facilities in the past 12 months	<ol style="list-style-type: none"> 1. inappropriate bodily touching 2. name calling 3. eve-baiting 4. bullying 5. causing fear 6. stress or shame 7. molestation, 8. beating, 9. fighting to lead to Cuts, bruises 10. Stalking 11. Any other specify
9	Was the perpetrator someone known to you?	<ol style="list-style-type: none"> 1. Yes 2. No

10	If yes, what is the relationship with the perpetrator?	<ol style="list-style-type: none"> 1. Father 2. Mother 3. Uncle 4. Aunt 5. Cousin 6. Boyfriend 7. Girlfriend 8. Acquaintance <p>Any other Specify.....</p>
11	What time did the incident occur?	<ol style="list-style-type: none"> 1. Early morning 2. During the day 3. Evening 4. Night
12	<p>How often are sexual violence cases reported?</p> <p><i>(Caused by the community members)</i></p>	<ol style="list-style-type: none"> 5. Daily 6. Weekly 7. Monthly 8. Any other <p>Specify.....</p>
13	Are you aware of any major health consequences of sexual violence?	<ol style="list-style-type: none"> 1. Yes 2. No
14	If Yes to Question 13 above, list the consequences of Sexual violence	<ol style="list-style-type: none"> 1. STIs / HIV/AIDS 2. Unwanted pregnancy

		<ol style="list-style-type: none"> 3. Injury (lacerations/ fractures) 4. Miscarriage 5. Depression 6. Low self-esteem 7. Suicide 8. Death
Perceptions associated with sexual violence in relations to shared sanitation		
15	How do you as an individual deal with Sexual violence occurring while sharing sanitation facilities?	<ol style="list-style-type: none"> 1. Intervene during the episode 2. Speak to your friend after the episode 3. Report to the police 4. Do nothing, it is taboo to tell others 5. No answer
16	Have you ever reported this incidence of sexual abuse to anyone, agency, or authority?	<ol style="list-style-type: none"> 1. Yes 2. No
17	How was it handled?	<ol style="list-style-type: none"> 1. Perpetrator was arrested 2. Case in court 3. Authorities did not act 4. No answer

18	Would you be capable of questioning/ challenging this behavior?	<ol style="list-style-type: none"> 1. Yes, I would 2. Yes, I have already 3. No 4. No answer
19	What in your view are the major challenges in stopping sexual violence	<ol style="list-style-type: none"> 1. Lack of awareness 2. Lack of seriousness by security officers 3. Impunity on the part of the perpetrator 4. Fear of revenge 5. All the above
20	Women who decline sexual advancements should be forced into sex	<ol style="list-style-type: none"> 1. Agree 2. Disagree 3. Don't know
21	Most sexual offenses are committed by someone known to you	<ol style="list-style-type: none"> 1. Agree 2. Disagree 3. Don't know
22	Female community members are most vulnerable to sexual violence	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree

	while accessing shared sanitation facilities in the Jua Kali region	
23	Fear of using a shared sanitation facility is high in the Jua Kali region	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree
24	Female community members in the Jua Kali region do not utilize shared sanitation facilities due to fear of being sexually violated	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree
25	Adequate lighting to the shared sanitation facilities increases vulnerability to sexual abuse	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree
26	Women and girls require escort while accessing shared sanitation facilities at night	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree
27	A woman should report to the authorities if she is forced to have sex without her consent while accessing shared sanitation facilities	<ol style="list-style-type: none"> 1. Disagree 2. Neutral 3. Agree
28	It is not okay for male idlers to inappropriately touch female	<ol style="list-style-type: none"> 1. Disagree 2. Neutral

	community members while accessing shared sanitation facilities	3. Agree
29	A woman must always submit to a man's needs for sex	1. Disagree 2. Neutral 3. Agree
30	My community/ political leader understands my sanitation needs relating to security	1. Disagree 2. Neutral 3. Agree
31	Males cannot be sexually violated while accessing shared sanitation facilities	1. Disagree 2. Neutral 3. Agree
32	Females and males should have separate, clean, lockable, and well-lit sanitation facilities	1. Disagree 2. Neutral 3. Agree
33	If we have experienced sexual violence, it is important to seek assistance from a person we trust.	1. Disagree 2. Neutral 3. Agree
Sanitation Factors Leading to Sexual Violence		
34	Long distances (more than 50 meters) to access a toilet facility in	1. Agree 2. Disagree

	the region expose one to sexual violence	3. Don't know
35	Do you feel safe when using shared sanitation facilities?	1. Very safe 2. Not safe 3. No answer
36	Are water points, latrines, and bathing facilities located where females and males feel safe to use them?	1. Yes 2. No
37	Do we have separate toilets/bathrooms for females and males?	1. Yes 2. No
38	Do all public latrines and shower blocks have locks on the inside?	1. Yes 2. No
39	Sanitation facilities are central	1. Yes 2. No
40	Are the sanitation facilities well-lit?	1. Yes 2. No

Appendix IV: Key informants interview guide

1. What do you understand by sexual violence?
2. How often are sexual violence cases reported in Jua Kali community?
3. What are the types of sexual violence perpetrated on young men/women that you have witnessed, observed, or heard about?
4. What are some of the sexual violations that take place when accessing sanitation facilities (water points, toilets?)
5. What timings are they frequently observed? (Morning afternoon, evening, night)
6. What are some of the consequences that are observed when accessing sanitation facilities?
7. What do Jua Kali community members do if they undergo sexual violence while accessing shared facilities?
8. Who do you think are perpetrators? (Friends, parents, relatives etc)
9. What happens to the perpetrators? Are they reported to authorities?
10. What are some of the challenges with shared sanitation facilities that expose communities to sexual violence? (Distance, lighting, disaggregated by gender, locks)

Any comment(s)?

Appendix V: Focused Group Discussion Interview guide

1. What do you understand by sexual violence?
2. How often are sexual violence cases reported in Jua Kali community?
3. What are the types of sexual violence perpetrated on young men/women that you have witnessed, observed, or heard about?
4. What are some of the sexual violations that take place when accessing sanitation facilities (water points, toilets?)
5. What timings are they frequently observed? (Morning afternoon, evening, night)
6. What are some of the consequences that are observed when accessing sanitation facilities?
7. What do Jua Kali community members do if they undergo sexual violence while accessing shared facilities?
8. Who do you think are perpetrators? (Friends, parents, relatives etc)
9. What happens to the perpetrators? Are they reported to authorities?
10. What are some of the challenges with shared sanitation facilities that expose communities to sexual violence? (Distance, lighting, disaggregated by gender, locks)

Any comment(s)?

Appendix VI: Focused group note-takers form

FORM

NO.

DATE

QUESTION	RESPONSE	OBSERVATION

Appendix VII: Clearance from Kenyatta University



KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
Email: kuerc.chairman@ku.ac.ke
kuerc.secretary@ku.ac.ke
Website: www.ku.ac.ke

P. O. Box 43844,
Nairobi, 00100
Tel: 8710901/12

Our Ref: KU/R/COMM/51/810

Date: 6th October, 2016

Mwangi Michael Gaitho
Kenyatta University
P.O. Box 43844 – 00100
NAIROBI

Dear Mwangi

APPLICATION NUMBER PKU/561/1650 – “SEXUAL VIOLENCE RISKS ASSOCIATED WITH SHARED SANITATION FACILITIES IN INFORMAL SETTLEMENTS, NAIROBI CITY COUNTY, KENYA”

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic “Sexual Violence Risks associated with Shared Sanitation Facilities in Informal Settlements, Nairobi City County, Kenya” received on 10th August, 2016 and discussed on 27th September, 2016.

2. APPLICANT

Mwangi Michael Gaitho

3. SITE

Nairobi City County, Kenya

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines AND APPROVED that the research may proceed for a period of ONE year from 6th October, 2016.

5. ADVICE/CONDITIONS

- i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
- ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
- iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
- iv. Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

DR. TITUS KAHIGA
CHAIRMAN ETHICS REVIEW COMMITTEE

I MWANGI MICHAEL GAITHO accept the advice given and will fulfill the conditions therein.

Signature..... *M Gaitho* Dated this day of..... 19th Oct 2016..... 2016.

cc. Vice-Chancellor
DVC-Research Innovation and Outreach



Appendix VIII: Research Authorization



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 3310571, 2219420
Fax: +254-20-318245, 318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
when replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/16/44041/14557**

Date:

8th November, 2016

Michael Gaitho Mwangi
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Sexual violence risks associated with shared sanitation facilities in informal settlements, Nairobi City County, Kenya*," I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **8th November, 2017**.

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

**BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nairobi County.

**COUNTY COMMISSIONER
NAIROBI COUNTY
P. O. Box 30124-00100, NBI
TEL: 341666**


The County Director of Education
Nairobi County.




Appendix IX: Research Permit from NACOSTI

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officer will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice



REPUBLIC OF KENYA



**National Commission for Science,
Technology and Innovation**

**RESEACH CLEARANCE
PERMIT**

Serial No.A **11726**

CONDITIONS: see back page


THIS IS TO CERTIFY THAT:
MR. MICHAEL GAIITHO MWANGI
of KENYATTA UNIVERSITY, 3604-200
Nairobi, has been permitted to conduct
research in Nairobi County

on the topic: SEXUAL VIOLENCE RISKS
ASSOCIATED WITH SHARED SANITATION
FACILITIES IN INFORMAL SETTLEMENTS,
NAIROBI CITY COUNTY, KENYA

for the period ending:
8th November,2017

.....
**Applicant's
Signature**

Permit No : NACOSTI/P/16/44041/14557
Date Of Issue : 8th November,2016
Fee Received :ksh 1000




.....
Director General
**National Commission for Science,
Technology & Innovation**

Appendix X: Research permit from Nairobi County

NAIROBI CITY COUNTY

Telegrams: "PRO-MINHEALTH",
Nairobi
Telephone: Nairobi
217131/312391
Fax: 217148
E-mail:
pmonairobi@yahoo.com
When replying please quote

COUNTY HEALTH OFFICE
NAIROBI
NYAYO HOUSE
P.O. Box 34349-00100
NAIROBI



Ref. No.
CMO/NRB/OPR/VOL1-

COUNTY HEALTH SERVICE

9th November 2016

Michael Gaiho Mwangi

Kenyatta University

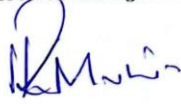
P.O BOX 43844-00100

RE: RESEARCH AUTHORIZATION

This is to inform you that the Nairobi City County Operational Technical Working group reviewed the documents "Sexual violence risk associated with share sanitation facilities in informal settlements,-Nairobi City County"

I am pleased to inform you that you have been authorized to undertake the study in Nairobi County – Ruaraka Sub County

On completion of the study, you will submit one hard copy and one copy in PDF of the research findings to our operational research technical working group.



R. MULI

**FOR: COUNTY DIRECTOR
HEALTH SERVICES
NAIROBI COUNTY**

FOR COUNTY DIRECTOR OF MEDICAL SERVICES

CC: Ruaraka Sub County MOH