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Open defecation and its impact on violence against women- A systematic review

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Open defecation and its impact on violence against women- A systematic review

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## Abstract

Open defecation and its impact on violence against women- A systematic review

By Natasha Poudyal

**Background:** Open defecation is common worldwide, being practiced by 892 million people, and is of particular concern in rural and peri-urban communities. Open defecation and lack of sanitation affect women disproportionately and contribute to violence against women. The main goal of this study was to investigate the association between open defecation and violence against women.

**Methods:** A systematic review was conducted for articles on the Web of Science database. Using the search string created, 94 articles were screened for review. Based on the title review of the 94 articles, 51 articles were selected for further review of abstracts. Based on abstract review, 37 were selected for full-text review. The full-text review yielded 13 articles that were included in this systematic review, ensuring that they followed the inclusion and exclusion criteria. Endnote was used to organize all citations.

**Results:** Most of the selected articles were based in low- and middle-income countries (LMICs). Open defecation was prevalent among young women living in peri-urban and rural settings. The prevalent forms of violence against women were sexual assault and rape because of open defecation. The practice of open defecation was feared by many at night (or in darkness). Furthermore, open defecation brought about shame and embarrassment, hence leading to discomfort discussing the topic among all women.

**Discussion:** Open defecation is a global concern affecting millions around the world. This systematic review can inform sanitation advocacy efforts that extend beyond mere access to gender sensitive perspectives. Using this systematic review, researchers, public health entities and government stakeholders can develop sustainable and targeted interventions to enhance the lives of women and their well-being, especially in communities where open defecation and violence against women are prevalent.

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## **Chapter 1. Literature Review**

### 1.1. Introduction to importance of good WASH practice

Water, Sanitation, and Hygiene (WASH) hold the key to women's health, well-being, and equality. Women face health risks like infections, diarrhea and complications related to poor WASH behavior and lack of proper sanitation (Winter et al., 2023). The consequences of inadequate WASH conditions reach far beyond the realms of physical health, extending to psychological consequences like anxiety and depression worsening the overall well-being of women (Dery et al., 2023). Similarly, women who do not have access to safe WASH facilities also have access to far less education and employment opportunities than those who do, perpetuating a cycle of missed opportunities for women (Akter & Chindarkar, 2020). This thesis delves into the intricate web of challenges arising from subpar WASH conditions and the profound effects they cast on the lives of women, casting a spotlight on the imperative need to address these disparities to ensure a healthier, more secure, and equitable world for all.

### 1.2. Immediate health risks due to open defecation

Open defecation, a practice of relieving oneself in open areas without access to proper sanitation facilities, is a global concern that echoes through countless communities, particularly affecting the lives of women (Saleem et al., 2019). This practice contaminates the environment, leading to the transmission of waterborne diseases such as diarrheal infections, cholera, and typhoid fever. The lack of proper containment and disposal mechanisms for human waste facilitates the spread of pathogens, posing a significant threat to community health (Boisson et al., 2016). Women face immediate risks caused by open defecation. The absence of proper sanitation facilities forces women to resort to open areas, where they are exposed to contaminated environments,



contaminated water sources, and disease vectors like flies and insects. Additionally, open defecation causes other physical health risks like urinary tract infections and reproductive tract infections. Research by Baker et al. in 2017 also found that the lack of clean water for personal hygiene can also lead to skin infections and other health problems. Furthermore, women are more vulnerable to the consequences of poor hygiene behavior such as complications and infections, affecting both maternal and child health (Mara, 2017). Inadequate hygiene practices during childbirth can lead to complications, further endangering women's health. In regions where proper facilities are lacking, women often resort to unhygienic and unsafe practices, leading to increased vulnerability to infections during pregnancy and delivery.

### 1.3. Privacy, increased vulnerabilities and gender based violence

In addition to immediate health risks, lack of proper sanitation facilities also indicates an unmet social need for women, rendering them vulnerable to gender-based violence. Privacy plays a crucial role in safeguarding the safety of women and girls, and its absence is closely linked to an increased vulnerability to various forms of violence. In many low- and middle-income countries (LMICs) women often lack access to secure and private sanitation facilities, which forces them into public spaces and unsafe environments, significantly heightening the risk of violence (Kayser et al., 2021). The absence of privacy infringes upon women's ability to maintain personal boundaries and security. In their research, Sahoo et al. found that in situations where women and girls must defecate openly due to a lack of proper toilets, they are exposed to the watchful eyes of others, making them easy targets for harassment and assault (Sahoo et al., 2015). This exposure erodes their sense of safety and contributes to a culture of fear and vulnerability.

Additionally, open defecation forces women into precarious social environments, especially in areas with inadequate lighting and safe sanitation facilities. The absence of private toilets and secure sanitation facilities compromises women's privacy and makes them susceptible to abuse, particularly during nighttime hours. Researchers have emphasized the importance of addressing privacy concerns in sanitation infrastructure by highlighting that lack of proper lighting and secluded areas create environments where perpetrators may exploit their vulnerability (Saleem et al., 2019). This heightened risk of sexual violence has severe physical and psychological consequences for women and girls thus affecting their dignity and overall well-being.

#### 1.4. Loss of dignity and psychological concerns

Open defecation can lead to a loss of dignity for women, causing immediate psychological distress and long-term consequences on their mental health. Inadequate sanitation facilities cause women to resort to open defecation practices often causing them immense shame and embarrassment. Compromised dignity associated with open defecation can have long-term consequences for women's mental health. In their recent research, Deshpande et al. found that the perpetual humiliation, shame and fear associated with this practice contribute to psychological stress and can lead to the development of mental health issues such as depression and anxiety (Deshpande et al., 2020). Poor mental health, as a result of open defecation, can create issues between partners and family members thus adding to the existing stress women face who practice open defecation.

### 1.5. Cultural norms and its consequences

Cultural norms, deeply embedded in the social fabric of several low- and middle-income countries (LMICs), can perpetuate gender-based violence by reinforcing unequal power dynamics and traditional expectations. Women's sanitation practices, including defecation, do not remain untouched by these cultural norms. These norms, rooted in traditional societal expectations, can have profound implications for women's access to sanitation facilities, exposing them to the risk of harm. Cultural norms and traditional expectations often dictate where women can defecate, restricting their mobility and choices (Jadhav et al., 2016). In many cultures, women are expected to conform to prescribed roles and behaviors that limit their freedom of movement. Traditional expectations of this sort reinforce societal inequalities and amplify the risks women face. Such restrictions can lead women and girls to resort to open defecation in secluded and unsafe environments, where they are more vulnerable to harassment, sexual assault, and violence (Osumanu et al., 2019).

Cultural norms also reinforce gender-based inequalities, perpetuating the idea that women's needs and safety are secondary to those of men. This unequal power dynamic further exacerbates the issue, as it discourages the allocation of resources and efforts toward providing safe sanitation facilities for women (Deshpande et al., 2020). In LMICs, patriarchal norms are particularly pervasive, emphasizing male dominance and control over women. Such norms legitimize gender-based violence by normalizing it as a means of exerting power and maintaining traditional gender roles (Fulu et al., 2013). Women who challenge these norms or seek autonomy may face increased risks of violence as a consequence of defying established gender hierarchies. Cultural norms can silence victims and discourage them from reporting

violence, creating a culture of impunity for perpetrators. Victims may fear stigma and social repercussions if they speak out against violence, leading to underreporting and perpetuation of the cycle of abuse (Koenig et al., 2003).

Cultural factors make it difficult for women to change behavior and practice safe sanitation. Through their study on socio-cultural and behavioral factors constraining latrine adoption in India in 2015, Routray et al. provide an example of where women stand in LMICs can be seen when a recently married woman in India starts living with her husband's family (Routray et al., 2015). Even if this woman has been using proper sanitation facilities and behavior in her house, once she is married and living with her husband and his family, she is expected to practice the same norms and traditions as her in-laws. If the in-laws practice open defecation, then despite her socio-economic or educational background, or choice, she, too, is expected to practice open defecation (Routray et al., 2015). A similar study conducted in rural Northern India and found that sometimes even where there is a toilet present in the household, women resort to open defecation because it has been the norm in the family for generations (Takhelchangbam et al., 2023). Thus, norms dictate social roles, behaviors, and hierarchies, often placing women in subordinate positions and making them vulnerable to various forms of violence. To combat gender-based violence in LMICs, interventions must not only address the physical aspects of violence but also challenge and change the cultural norms that perpetuate it. A study suggests that efforts involve promoting gender equality, encouraging gender-sensitive education, and fostering community dialogue to challenge harmful norms and behaviors (Jewkes et al., 2011).

## 1.6. Impact on education and employment

Insufficient access to toilets not only poses a threat to the health and safety of women but also acts as a significant barrier to their educational attainment. The absence of safe and hygienic toilets near schools and workplaces presents numerous challenges that hinder educational attainment for women. The lack of sanitation facilities near schools significantly impacts girls' attendance and retention in educational institutions. Girls often miss school during menstruation due to the unavailability of private and sanitary spaces for hygiene management (Freeman et al., 2012). This absenteeism can lead to lower educational attainment, reducing their chances of gaining valuable skills and knowledge required for economic participation. Moreover, girls who experience embarrassment and discomfort due to inadequate facilities may be more likely to drop out, limiting their educational prospects.

Similar to lack of sanitation facilities in schools, open defecation also impacts economic participation, perpetuating cycles of disadvantage. Exposure to unsanitary conditions resulting from open defecation increases the risk of diseases, such as gastrointestinal infections and waterborne illnesses (Winter et al., 2023). These health concerns often lead to frequent absenteeism, reduced work productivity, and, in severe cases, permanent disabilities.

Consequently, women who are forced to engage in open defecation may find it challenging to secure and maintain gainful employment. Moreover, the time and effort required for open defecation in the absence of proper sanitation facilities divert women from pursuing skills development, limiting their qualifications for a broader range of job opportunities (Meagher et al., 2021). A recent research exploring sanitation related decision-making, highlighted that the time spent on sanitation-related tasks takes away from other essential activities for employment

perpetuating gender inequalities (Doma et al., 2023). Furthermore, the lack of private toilets may also restrict their ability to engage in certain occupations or industries, perpetuating gender-based occupational segregation. As a result, inadequate sanitation facilities contribute to a persistent gender wage gap and hinder women's economic advancement (Akter & Chindarkar, 2020).

### 1.7. Challenges and barriers to promoting good WASH practices

Socio-economic disparities and inadequate infrastructure remain significant challenges in ensuring access to sanitation facilities for women. Low-income and marginalized communities often face difficulties in accessing basic WASH services, leading to suboptimal hygiene behaviors and increased vulnerability to infections (Hulland et al., 2015). Moreover, cultural norms and gender dynamics can influence WASH practices, with traditional practices and beliefs shaping behaviors related to hygiene and sanitation (Akpabio, 2012). Overcoming these socio-economic and cultural barriers requires tailored interventions that consider community-specific contexts and engage local stakeholders to ensure the relevance and effectiveness of WASH promotion efforts. Identifying challenges and barriers to promoting proper WASH practices is crucial for designing effective interventions and policies that address these obstacles.

Healthcare system limitations also present barriers to promoting good WASH practices.

Inadequate integration of WASH education and limited resources for conducting hygiene and sanitation interventions within healthcare facilities hinder efforts to educate and support women (Vaivada et al., 2022). A lack of awareness among healthcare providers about the critical role of WASH in women's health may result in missed opportunities to address violence against women. In addition, a disconnect between public health policies and community-level

implementation can impede the translation of WASH-related recommendations into actionable behaviors. Addressing these challenges requires strengthening the capacity of healthcare systems to incorporate WASH considerations into routine maternal care, offering training to healthcare providers, and fostering partnerships between health authorities and WASH-focused organizations.

In summary, the lack of access to toilets and proper hygiene resources can exacerbate the vulnerabilities women face and hinder their overall quality of life. Cultural norms reinforce societal inequalities and amplify the risks women face, underscoring the need for strategies that challenge them while improving sanitation infrastructure. Societal and cultural norms normalize violence as a means of exerting power, silencing victims, and creating a culture of impunity for perpetrators. The humiliation and shame associated with open defecation erode women's sense of safety and well-being. Furthermore, open defecation plays a pivotal role in illiteracy and limited job opportunities for women, exacerbating economic disparities. The multifaceted relationships between open defecation and gender-based violence, probes the intricacies of privacy, cultural norms, and socioeconomic factors that intersect in shaping women's experiences. Thus, there is an immediate need to explore the impact that open defecation and access to toilets has on violence against women and girls in LMICs.

## 1.8. Goals and Aims

Given the challenges posed by open defecation on women's health and well-being, it is important to address them to make communities safer for women. The goal of this thesis is to

understand the impact inadequate access to toilets and open defecation has on women's safety, security, and well-being by performing a systematic review. There are two aims of this thesis:

1. To examine if there is an association between a lack of open defecation and violence against women or girls.
2. To recommend interventions to academic institutions, public health entities, government and the communities that benefit women's health and well-being based on the findings of the thesis.

### 1.9. Significance

A systematic review examining the impact of open defecation on women's health and security, with a specific focus on its relationship with violence against women, holds profound significance in the realms of public health, gender equality, and social justice. This endeavor is a critical call to address a deeply entrenched crisis. It sheds light on the inextricable links between open defecation, women's health, and the violence they face due to the absence of proper sanitation facilities. By systematically synthesizing existing knowledge, this review provides a comprehensive understanding of the far-reaching consequences of inadequate sanitation on women's lives, elucidating how it perpetuates the vulnerabilities they encounter. Ultimately, the findings of this review have the potential to inform and shape future interventions and policies, paving the way for enhanced safety, security, and well-being for women in low- and middle-income countries where open defecation practices persist. The significance lies in its potential to guide transformative actions that aim to not only alleviate the hardships women face but also empower them to live with the dignity, security, and rights that every individual deserves.



## Chapter 2. Methods

There is currently limited research on the impact open defecation and access to toilets has on violence against women and girls in low- and middle-income countries (LMICs). This systematic review study did not require review by the Institutional Review Board (IRB) as the research did not involve human subjects and did not use any identifiable personal data.

### 2.1. Overview of the systematic review process

After the search string was applied to the Web of Science database, 94 articles were filtered. Firstly, the articles were screened by title review, secondly by abstract review and finally by full text review. In each step, the same inclusion and exclusion criteria was used. 13 articles were selected for this systematic review. Exposure and outcome data were extracted from the selected articles in a tabular format for analysis. The analysis is reflected in the tables in the Results section.

#### *Search String*

The search string for Web of Science used for this systematic review was:

((defecat\* AND (open OR outside)) OR (access\* AND (toilet\* or latrine\* or sanitation))) AND ((violen\* or oppress\* or rape\* or assault\* or harassment\*) AND (women or woman or girl\* or female\*)).

There were no limits on publication year.

#### *Search Criteria for Systematic Review*

The search for articles was based on articles documenting relationships between open defecation

or toilet access and violence against women (VAW). Key search terms included open defecation, defecation on the outside, defecation in the open, access to toilets, violence against women and girls, harassment, rape, and oppression.

## 2.2. Article screening

The articles were screened in the following order: title review, abstract review and then full text review. The full text of the article was obtained for all studies meeting the inclusion criteria.

Articles not meeting inclusion criteria during full text review were excluded. Reference linking was also done to identify additional articles; references cited in the included articles were examined to identify other relevant articles not originally found in the initial search.

### *Article Inclusion and Exclusion Criteria*

#### Inclusion Criteria:

Articles included the words open defecation, access to toilets or latrines, and violence against women, in the abstract, or in the text

#### Exclusion criteria:

Articles that were reviews and not primary research

Comments and letters to the editor

Systematic reviews and meta-analyses

Articles in languages other than English

### 2.3. Data extraction

Once the articles were screened through the inclusion and exclusion criteria, there were a total of 13 articles that were chosen to be analyzed. After full text review, exact words, or phrases or sentences from the articles were extracted and recorded in an MS Excel sheet. The columns in the sheet comprised of the following study characteristics: citation information (1<sup>st</sup> author and year of publication), study design, sample size, target population, location, exposure (open defecation or toilet access), outcome (violence against women or girls), association (present or absent) between exposure and outcome, and description of association (positive or negative) between exposure and outcome.

### 2.4. Data analysis

Analysis was performed on the data extracted from the 13 screened articles. Four tables were created to record important information about the articles for analysis. Table 1 summarized the characteristics of the articles. Once the categories were defined, the 13 articles were thoroughly reviewed; the number of articles that fit each of the categories were identified and the counts were recorded. Conclusions made based on Table 1 can be found in the Results section.

Similarly, Table 2 identified which of the 13 articles showed a positive relationship between exposure (open defecation) and the outcome (violence against women). For this, the results and discussion sections were re-read and searched for words like “association” and “relationship” describing the linkage between the exposure (open defecation) and outcome (violence against women). Furthermore, for Tables 3 and 4, I counted how many of the selected articles described the target population and women’s perceptions on the exposure and outcome and recorded them

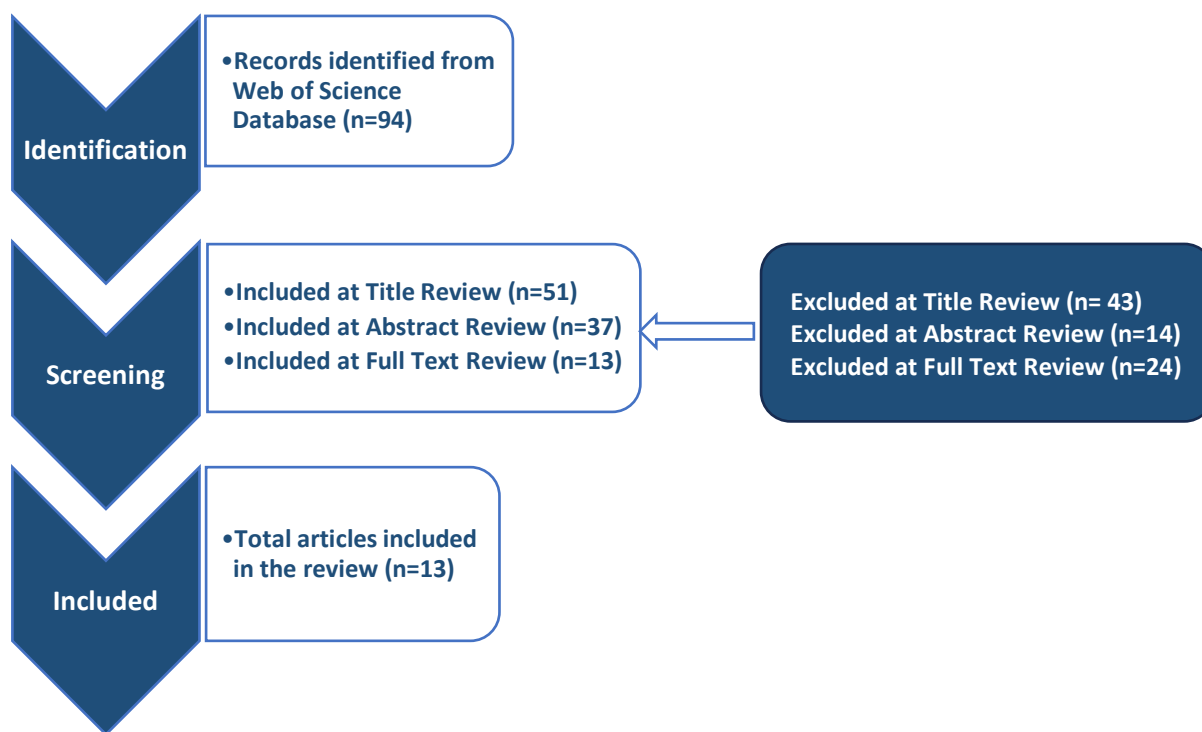
in the respective tables. Further descriptive analyses of Tables 1, 2, 3 and 4 can be found in the Results section.

## Chapter 3. Results

### 3.1. Identification of the articles

For this systematic review, 94 titles relating open defecation and access to toilets to violence against women were reviewed for relevance and 51 of them were selected for further review (Figure 1). Of these, 37 were selected based on abstract review. Of the articles that had their abstracts reviewed, 13 were included for full text review and were further analyzed for the purpose of this thesis. The rest of the studies were excluded based on the inclusion and exclusion criteria mentioned in the Methods section.

**Figure 1: Identification of articles on Web of Science database**



**Table 1: Population characteristics from 13 selected systematic review articles**

<b>Characteristic</b>	<b>Number of articles with this characteristic</b>
<b>Countries:</b> India Kenya Ethiopia Ghana South Africa	8 2 1 1 1
<b>Publication date of articles:</b> January 2021 to December 2023 January 2018 to December 2020 January 2015 to December 2017	5 4 4
<b>Age of study population:</b> Women aged 15-49 years Women age was not specified Women and men age was not specified	5 4 4
<b>Study area:</b> Rural and urban Peri urban Rural Informal settlements	5 4 3 1
<b>Range of population sample sizes:</b> <100 100-1,000 1,000-10,000 10,000-100,000 >100,000	7 0 1 4 1
<b>Forms of violence described in articles: (overlapping categories) <sup>1</sup></b> Sexual Assault Rape Teasing Peeping Physical (beating) Revealing	11 10 4 4 4 1

<sup>1</sup> Some articles described more than one form of violence

<b>Study Design:</b>	
Qualitative	7
Cross sectional	6

### 3.2. Characteristics of the selected articles

To summarize the characteristics of the studies used, I read the full text of the 13 included articles and listed the characteristics noted in Table 1. Eight (62%) out of the 13 studies included in this systematic review were based in India (Table 1). The publication year of the articles were such that 38% of them were published between January 2021 and December 2023, 31% of the articles were published between January 2018 and December 2020 and 31% were published between January 2015 and December 2017. 38% of the articles mentioned the study population age to be between 15-49 years. 31% of the articles did not specify women's age and 31% of the articles that used both men and women in the study also did not mention the specifics of the age. Most of the articles (38%) included both rural and urban populations. The majority of the population sample sizes (54%) in the selected articles were less than 100 individuals. The most common forms of violence faced by women practicing open defecation were sexual assault and rape. Of the 13 articles reviewed, there were 7 qualitative studies and 6 cross sectional studies. In conclusion, based on Table 1, it was observed that the characteristics that were most associated with violence against women were related to residence of women in peri-urban and rural areas compared to urban areas, and those who faced rape and sexual assault most commonly when practicing open defecation.

**Table 2: Association between Open Defecation and Violence against women**

1 <sup>st</sup> Author, Year	Association present? Yes/No/Inconclusive	If association present, positive or negative?
Sahoo, 2015	Yes	Positive
Khanna, 2015	Yes	Positive
Winter, 2016	Yes	Positive
Jadhav, 2016	Yes	Positive
Winter, 2018	Inconclusive	Not Applicable
Azeez, 2019	Yes	Positive
Gibbs, 2020	Yes	Positive
Barchi, 2020	Yes	Positive
Assefa, 2021	Yes	Positive
Biswas, 2021	Yes	Positive
Kayser, 2021	Yes	Positive
Nunbogu, 2023	Yes	Positive
Bandyopadhyay, 2023	Yes	Positive

### 3.3. Association between open defecation and violence against women

To investigate the association between open defecation (exposure) and violence against women (outcome), I calculated the percentage of articles that had the words “association” or “relationship” and “open defecation” and “violence” in the Results and Discussion sections of the 13 included articles (Table 2). I found that 92% of the 13 articles demonstrated that there was an association between open defecation and violence against women. There was one article that mentioned the results of the study were inconclusive. Therefore, based on my search, there is an association between open defecation and violence against women.



**Table 3: Comparison of target populations**

Common themes/Risk Factors	No. of articles mentioned risk factors
Rural women, compared to urban women, were more affected by open defecation and VAW <sup>2</sup>	8/11
Peri-urban women, compared to rural women, were more affected by open defecation and VAW	3/5
Younger/recently married women, compared to older women, were more affected by open defecation and VAW	8/8

#### 3.4. Comparison of target population

To compare the characteristics of the population that was impacted by violence due to open defecation, I read the Results and Discussion sections of the 13 included articles and calculated the number and the percentage of articles that mentioned the themes listed in Table 3. 73% of the articles stated that rural women faced more violence compared to urban women. 60% of the articles stated that women living in peri urban areas were more affected by violence due to open defecation compared to rural women. Additionally, 100% of the articles mentioned that young and recently married women were more affected by violence as a consequence of open defecation in comparison to older women of the same community. In conclusion, the most affected population were young, recently married and living in either rural or peri-urban communities.

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<sup>2</sup> VAW = Violence against women

**Table 4: Women's perceptions and concerns**

Women's perception of OD <sup>3</sup> and VAW	No of articles
Fear of violence due to open defecation increased with darkness	11/11
Discomfort discussing violence due to open defecation	4/4
Women faced with shame due to lack of privacy	6/6

### 3.5. Women's perceptions and concerns

To portray women's perception of open defecation and violence in the 13 reviewed articles, I read the Results and Discussion sections thoroughly, searched for common women's perceptions and concerns regarding open defecation and violence and calculated the number and percentage of articles that included the perceptions listed in Table 4. 100% of the articles discussed increased fear of violence due to darkness when practicing open defecation. All the articles also stated that women felt uncomfortable discussing topics of open defecation or violence due to open defecation. Similarly, 100% of the articles mentioned that women faced shame due to lack of privacy during open defecation. In conclusion, these common themes in the selected articles shape the way women perceive open defecation and violence resulting from it.

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<sup>3</sup> OD = Open defecation

## **Chapter 4. Discussion**

The goal of this systematic review was to investigate the association between open defecation and violence against women. The study also aimed to identify the characteristics of the women most affected by violence as a result of open defecation and to better understand women's perception of open defecation and violence, so that recommendations could be made based on these factors.

### **4.1. Main findings**

This systematic review found that there is an association between open defecation and violence against women. This is corroborated by the systematic review conducted in 2019 which explored the health and social impacts of open defecation on women; their study identified increased risk of sexual exploitation as an overarching theme across their findings (Saleem et al., 2019). Based on what women reported in the 13 selected articles, the most common types of violence faced by women due to open defecation were sexual assault and rape. A high prevalence of sexual assault and rape may be a direct result of the patriarchal beliefs that countries like India still foster (Roy & Dastidar, 2018). The deeply rooted patriarchal perspectives of the Indian society among other social determinants causes the increased number of rapes in India. Men feel as though they are entitled to do as they please, including sexually assault and rape women. Similarly, as the Roy article states there is stigma associated with sexual assault and rape, women often choose not to file a police report post facing violence because publicity of it may result in social exclusions, failure to find a suitable groom (if unmarried), loss of family "honor" and allegations that the victim was being promiscuous. In patriarchal societies where gender-based violence is deeply

entrenched, having to openly defecate could add another layer of vulnerability for women, making them additionally exposed to sexual violence.

Similarly, as mentioned by the women in the screened articles of this systematic review, the population that was most affected by violence due to open defecation was young, recently married women and among those who were either living in peri-urban or in rural communities. Jewkes suggested in his article that 49.3% of the men interviewed to understand motives around rape said that they raped young girls because “they thought they would not tell” (Jewkes et al., 2011). One of the reasons why men raped young women and adolescent girls was that they believed that they will be silent about what happened to them due to shame and embarrassment. Secondly, recently married women were targets for rape since in countries like India, the women move in with the in-laws to live in a new geographic location (Sahoo et al., 2015). When women move into a new and unfamiliar environment, they may be unsure of where the safe spaces to open defecate are and hence fall victim to sexual assault and rape.

Likewise, women in peri-urban and rural communities may be more affected by violence due to open defecation because of dishonest police officers who do not want to record cases due to corruption (Roy & Dastidar, 2018). Biswas & Joshi suggested additional factors; women in peri-urban areas fall victim to sexual assault and rape since they are often found having to pay for toilets which they cannot afford, thus forcing them to openly defecate (Biswas & Joshi, 2021). The population living in peri-urban areas often are financially constrained and having to pay nominally may also affect their decision on whether to use a safe space to defecate (Shiras et al., 2018). Furthermore, lack of in-house toilet facilities compels women to travel long distances to

find areas for open-defecation which makes them vulnerable to various forms of violence (Fiasorgbor, 2013). This might be specifically relevant in rural areas as Gonsalves et al. found that reducing the incidence of sexual assault and improving women's security could be greatly improved by increasing the coverage of toilets in rural area (Gonsalves et al., 2015). Therefore, the combination of recently married women's young age, their being placed in a new social environment, dishonest policing lack of toilet access in rural areas and cost of using toilets in per-urban areas could make women additionally vulnerable to sexual violence as a result of practicing open defecation.

There were three common perceptions and concerns around open defecation and violence that women expressed in the reviewed articles. Firstly, well-lit toilets and time of the day played a vital role in making women feel secure while defecating. Women having to defecate in the absence of light or during nighttime often added an additional layer of fear of violence (Sahoo et al., 2015). The absence of light made women and girls easy targets of violence. Secondly, all women mentioned discomfort discussing topics related to open defecation and violence or the association between the two. This was also noted in another study which found that in several low- and middle-income countries (LMICs), concerns surrounding women's sanitation practices are stigmatized (Cardoso et al., 2019). Lastly, an article discusses the implications of socio-cultural norms related to notions of honor, shame, purity, and sanitation practices and mentions that women often feel a loss of dignity and immense shame due to the practice of open defecation and feel uncomfortable discussing sexual violence publicly (Rashid & Michaud, 2000).

## 4.2. Strengths and Limitations

### *Strengths*

Several strengths were found in this systematic review. The inclusion and exclusion criteria were broad, allowing a range of studies to be included. Furthermore, the findings show the viewpoints of many authors and their results thus establishing a strong association between violence against women and open defecation or toilet access.

### *Limitations*

This systematic review has a few limitations. The literature search was conducted on the Web of Science database alone. This means that I may be missing some articles that can be found in other databases such as Embase or PubMed. Additionally, a systematic review might inadvertently overrepresent studies that demonstrate a strong association between open defecation and violence, potentially skewing the overall picture of the relationship.

## 4.3. Implications

Investigating the impact of open defecation on violence against women, has significant implications for research and policy development. This systematic review can guide future research in the area of gender-sensitive sanitation, which can help address the health and social impacts faced by women as a result of open-defecation. By identifying gaps in the existing literature and methodological limitations, it can inform researchers about where further investigation is needed. For instance, it reveals the need for more studies in specific geographical regions, highlights the importance of employing standardized measurement tools, or the significance of considering cultural and contextual factors in research designs. This, in turn, can

lead to more targeted and robust research efforts aimed at better understanding the association between open defecation and violence against women. Ultimately, the findings of this systematic review can serve as a foundation for evidence-based policymaking and the development of interventions that not only address sanitation challenges but also prioritize the safety and well-being of women and girls in these regions. The increased awareness brought forth by future research in the area can guide advocacy efforts and resource allocation toward interventions that prioritize women's safety, dignity, and rights while addressing open defecation.

#### 4.4. Recommendations

Several recommendations can be made based on this systematic review. It is evident that open defecation and toilet access plays a major role in violence against women. We have listed some tried practices that may be beneficial to mitigate the harm that open defecation causes to women below. It is safe to say that some of the most successful programs are due to the collaboration between international organizations, the government and communities where the sanitation programs are implemented. There are two such examples discussed below:

1. India's Swachh Bharat Abhiyan (Clean India Mission) launched in 2014. This nationwide campaign sought to eliminate open defecation by constructing millions of toilets, especially in rural areas. The program also included behavior change communication to promote proper hygiene practices. India's initiative illustrates the government's commitment to addressing the issue of open defecation and improving sanitation infrastructure (Hossain et al., 2022).

2. Similarly, in Ghana, the government has implemented the Community-Led Total Sanitation (CLTS) approach, which focuses on community mobilization and behavior change to end open defecation rather than relying solely on external interventions. It encourages communities to recognize the detrimental effects of open defecation on their health and well-being and motivates them to collectively act. This approach has been successfully applied in countries like Bangladesh and Ghana, where community members come together to construct toilets and promote the abandonment of open defecation practices (Mara, 2017).

These initiatives underline the importance of collaborative efforts between governments, civil society, and international organizations to achieve meaningful improvements in sanitation infrastructure and hygiene practices in low- and middle-income countries (LMICs). Community ownership is equally important for the success of such initiatives as community-led efforts often integrate culturally appropriate practices and local knowledge, which are essential for addressing deeply rooted sociocultural norms associated with sanitation and hygiene (Jadhav et al., 2016). By involving community leaders, influencers, and residents in decision-making processes, these initiatives foster a sense of ownership and responsibility for improving sanitation conditions. Consequently, community-led approaches have proven effective in not only constructing toilets but also creating sustainable changes in behavior and attitudes toward open defecation, contributing to long-term solutions in LMICs.

Other recommendations that can be made based on this systematic review are also listed below:



1. Create initiatives to promote improved sanitation facilities and behavior change by building and promoting the use of toilets and latrines that can significantly reduce the risk of disease transmission by containing and treating human waste effectively.
2. Promote sanitation campaigns that raise awareness about the importance of proper hygiene behaviors and the dangers of open defecation that can lead to behavior change and improved sanitation practices.
3. Develop programs using comprehensive strategies that prioritize women's safety, dignity, and rights while addressing the issue of open defecation.
4. Promote awareness campaigns that challenge cultural norms that restrict women's mobility and dictate their behavior.
5. Comprehensive strategies that aim to empower women economically and socially, giving them a stronger voice in decision-making regarding sanitation and hygiene practices.
6. Include women in the planning and implementing of sanitation initiatives.

#### 4.5. Public health implications

This systematic review investigating the link between open defecation and violence against women in LMICs has significant public health implications. It highlights how inadequate sanitation practices can contribute to a range of health problems for women, including heightened risks of physical and psychological violence. These findings underscore the urgent need for improved sanitation infrastructure as a public health priority. Access to safe and private toilets not only reduces the risk of violence but also mitigates the transmission of waterborne diseases, improves overall hygiene, and enhances the well-being of women and communities (Balakrishnan & Khurshid, 2016).

Likewise, this thesis emphasizes the interconnectedness of health, gender equality, and social justice. It illustrates how gender-based violence is not solely a social or legal issue but also a public health concern with far-reaching consequence (Cislaghi et al., 2020). Recognizing this linkage encourages a more holistic approach to public health interventions, where sanitation programs are integrated with gender-sensitive strategies. By addressing the root causes of violence against women, such as unequal power dynamics and sociocultural norms, public health efforts can contribute to broader societal transformations that promote gender equality and improve the overall health and well-being of women.

#### 4.6. Conclusion

The goal of this systematic review thesis was to examine the association between open defecation, access to toilet and violence against women. We can conclude there is a strong relationship between open defecation and violence against women. The most vulnerable population of women affected by violence because of open defecation are those who are young in age, living in peri-urban or rural areas. The most prevalent type of violence women face is some form of sexual assault like touching, grabbing, slapping of body parts without consent, or rape. The absence of light increases the frequency and sometimes severity of violence against women. Several women across the globe feel discomfort and shame discussing topics around open defecation and sexual violence. Therefore, addressing the challenges of open defecation and inadequate access to sanitation facilities is of high priority which is a collective responsibility for governments, civil society and communities. Modifying interventions to specific needs of individual communities have the potential to improve health outcomes and

overall quality of life for women. Additionally, interventions aimed at improving sanitation infrastructure and practices must go beyond the physical aspects and encompass a holistic approach that safeguards women's well-being. Open defecation is a public health concern that stands at the intersection of gender and sanitation, and it should be addressed as such.

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