

Tracing the Behavioral Roots: Determinants of Open Defecation Practices

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ABSTRACT

Open defecation remains a persistent environmental health challenge in many low-income and developing regions. This behavior contributes to increased exposure to environmentally transmitted diseases, parasitic infections, and broader declines in community well-being. This review aims to examine the determinants that shape open defecation practices through a comprehensive literature synthesis and to identify consistent patterns of significant associations reported in recent studies. The objective of this study is to analyze the key determinants influencing open defecation behavior by reviewing empirical evidence published between 2021 and 2025, and to map the dominant factors across theoretical domains of behavioral determinants. This study employed a structured literature review of 30 empirical articles focusing on determinants of open defecation. Sources included Google Scholar, PubMed, ScienceDirect, and Garuda, with publication years ranging from 2021 to 2025. The analysis was guided by a behavioral framework comprising three determinant groups: predisposing factors, enabling factors, and reinforcing factors. Data synthesis emphasized significance levels, frequency of variable occurrence, and consistency of findings across studies. The review indicates that predisposing factors are the most dominant determinants of open defecation behavior. Education level appeared in 63% of studies, knowledge in 53%, and attitudes in 50%, all showing significant associations. Enabling factors also played an important role, particularly latrine availability (33%) and water availability (27%). Reinforcing factors, including social support and the role of health workers, emerged as influential determinants, contributing significantly in more than 70% of the reviewed studies. This study concludes that open defecation behavior is shaped by a complex interplay of individual, environmental, and social determinants. Effective interventions must therefore integrate improvements in knowledge and attitudes, infrastructure provision, and sustained community-based reinforcement mechanisms.

Keywords: open defecation behavior; predisposing factors; sanitation determinants

INTRODUCTION

Open defecation continues to represent a major global public health challenge despite substantial progress achieved over recent decades. This practice contributes directly to increased exposure to environmentally transmitted diseases, facilitates the spread of parasitic infections, and undermines overall community well-being. Beyond its health implications, open defecation also reflects persistent inequalities in access to adequate sanitation facilities and indicates slow adoption of hygienic behavioral norms within many communities. According to the most recent report from the World Health Organization and the United Nations Children's Fund through the Joint Monitoring Programme covering the period 2000–2024, an estimated 354 million people worldwide were still practicing open defecation in 2024, even after a reduction of more than 430 million individuals since 2015. In Indonesia, the prevalence of open defecation declined markedly from 35.46% to 3.4% in 2024, illustrating significant national progress while simultaneously highlighting that the practice has not been fully eliminated, particularly in areas with limited basic sanitation and pronounced socio-economic disparities [1].

Recent global monitoring data further reveal that most countries have achieved open defecation prevalence levels below 25%. Nevertheless, several nations in Sub-Saharan Africa continue to experience extremely high prevalence, with some regions reaching 50–75%. These figures underscore profound inequalities in global sanitation access. Regions such as Asia, Latin America, Europe, and much of Oceania have demonstrated relatively low prevalence, yet countries with low economic status, especially in West and Central Africa continue to face substantial barriers related to sanitation infrastructure, access to safe water, and sustained behavioral change initiatives [2]. This situation indicates that the persistence of open defecation is not solely attributable to the availability of physical facilities but is also shaped by complex social, economic, cultural, and environmental determinants.

Within the global policy landscape, eliminating open defecation constitutes a central component of Sustainable Development Goal 6, which aims to ensure universal access to clean water and adequate sanitation. Target 6.2 specifically emphasizes the cessation of open defecation through the provision of improved sanitation facilities, promotion of hygienic behaviors, and implementation of community-based interventions. Although many countries have made notable progress toward achieving this target, others remain significantly behind due to limited financial resources, insufficient policy commitment, ongoing conflict, unplanned urbanization, and persistent inequalities between urban and rural sanitation services [3]. These challenges highlight the need for integrated, context-specific strategies that address both infrastructural and behavioral dimensions of sanitation improvement.

A growing body of literature demonstrates that the determinants of open defecation are multidimensional and interrelated. Predisposing factors, including educational attainment, knowledge, attitudes, cultural norms, and age have been shown to influence sanitation behavior and decision-making processes [4,5]. Enabling factors, such as the availability of water and sanitation facilities, geographic conditions, local infrastructure support, and access to media information, play a crucial role in facilitating or constraining sanitation practices [6,7]. Reinforcing factors, including social support from community leaders and the involvement of health workers, further strengthen or weaken community tendencies to maintain or modify sanitation behaviors [8]. A comprehensive understanding of these determinants is therefore essential for designing effective, contextually relevant, and sustainable intervention strategies.

Given this background, the present article aims to explore the underlying behavioral roots of open defecation through an extensive and integrative review of literature examining the determinants that contribute to its persistence across diverse socio-ecological contexts. By synthesizing empirical findings from multiple regions and methodological approaches, this study seeks to construct a comprehensive understanding of how predisposing factors, enabling conditions, and reinforcing influences interact to shape sanitation behaviors within communities. Such an approach allows for the identification of recurring patterns, contextual variations, and structural constraints that collectively sustain open defecation practices despite ongoing global and national intervention efforts. Furthermore, this review emphasizes the importance of situating behavioral determinants within broader systems of inequality, including disparities in education, gender dynamics, cultural norms, environmental vulnerabilities, and governance capacity. Through this expanded analytical lens, the study aspires to provide a more nuanced

foundation for designing intervention programs that are not only technically sound but also socially responsive, culturally attuned, and capable of fostering long-term behavioral transformation. Ultimately, the insights generated from this review are expected to support policymakers, public health practitioners, and community stakeholders in developing more effective, evidence-based strategies to reduce open defecation in populations that remain at heightened risk [4–8].

METHODS

This article was developed using a narrative literature review approach, designed to synthesize, compare, and critically interpret empirical research findings related to the determinants of open defecation behavior. A narrative review was selected because it allows for a broad, integrative examination of diverse study designs, contextual variations, and theoretical perspectives, thereby enabling a more comprehensive understanding of the multifaceted factors that contribute to the persistence of open defecation across different populations and settings. Through this approach, the review aims not only to summarize existing evidence but also to identify conceptual patterns, methodological gaps, and emerging themes that may inform future research and intervention strategies.

The literature search was conducted across five major academic databases: Google Scholar (Indonesian and English sources), PubMed, ScienceDirect, and Garuda. The publication window was restricted to the years 2021–2025 to ensure that the review captured the most recent empirical developments and contemporary sanitation challenges. Search terms were carefully tailored to reflect the behavioral, social, and environmental dimensions of open defecation. In Indonesian, the search strategy employed combinations of terms such as “buang air besar sembarangan” AND (faktor OR determinan) AND (perilaku OR kebiasaan OR tindakan) AND (masyarakat OR penduduk OR komunitas) AND (sosial OR ekonomi OR lingkungan OR budaya OR pendidikan). In English, the search strategy included “open defecation” AND (determinants OR factors OR “associated factors” OR “behavioral factors” OR “psychosocial factors” OR “socioeconomic factors” OR “environmental factors” OR “cultural factors”) AND (“rural communities” OR “developing countries”). These keyword combinations were selected to maximize retrieval of studies addressing both individual-level and structural determinants of open defecation behavior.

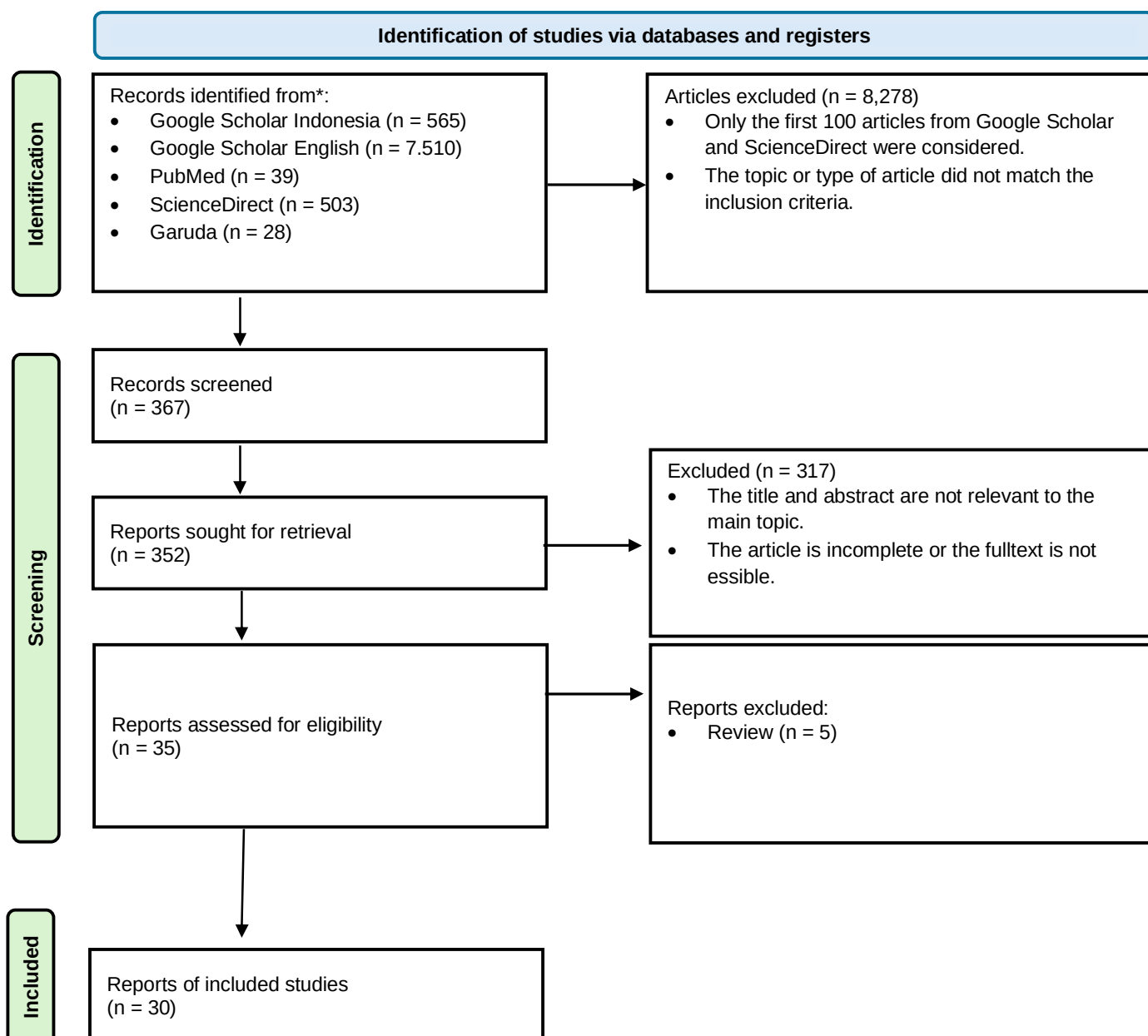


Figure 1. PRISMA flowchart

The initial search yielded a substantial number of articles, which were subsequently screened through a multi-stage selection process. Titles and abstracts were first reviewed to assess relevance to the topic of open defecation determinants. Articles were included if they presented empirical data, examined behavioral or contextual factors associated with open defecation, and provided sufficient methodological detail for evaluation. Studies that did not address determinants of open defecation, lacked empirical evidence, were purely theoretical, or represented duplicate records were excluded from further analysis. Full-text availability was also a mandatory criterion to ensure that methodological rigor, analytical procedures, and contextual interpretations could be thoroughly assessed.

The final set of articles included in the review encompassed a wide range of research designs, reflecting the diversity of methodological approaches used to study sanitation behavior. These designs included cross-sectional studies, cohort studies, qualitative investigations, descriptive analyses, and community-based surveys. The inclusion of varied study types allowed for a richer synthesis of evidence, capturing both quantitative associations and qualitative insights into cultural norms, social dynamics, and environmental constraints influencing open defecation practices. After completing the screening and eligibility assessment, a total of 30 articles met all inclusion criteria and were incorporated into the review. The study selection process, including identification, screening, eligibility assessment, and final inclusion, is illustrated in the flow diagram presented in Figure 1.

The analysis was conducted using a descriptive–narrative approach, involving the systematic extraction of core information from each study. This process included identifying the study location, research design, sample characteristics, determinant variables, and statistically significant associations reported by the authors. Each determinant factor was subsequently organized according to a widely used health-behavior framework, which classifies influences into predisposing factors, enabling factors, and reinforcing factors. Grouping the determinants into these theoretical categories allowed the review to identify overarching patterns, recurring themes, and cross-study variations, thereby providing a clearer understanding of how different behavioral, environmental, and social components interact to shape open defecation practices across diverse settings.

RESULTS

During the initial identification stage, a total of 8,645 articles were retrieved from all databases. To maintain readability and ensure relevance, an initial screening was conducted by limiting the search to the first 100 results from Google Scholar and ScienceDirect, along with all articles indexed in PubMed and Garuda, resulting in 367 articles. After removing duplicate records, 352 articles remained and were subsequently screened based on their titles and abstracts. A total of 35 articles met the preliminary relevance criteria. Following full-text assessment, 5 articles were excluded because they employed a literature review methodology, leaving 30 articles that fulfilled all inclusion criteria.

Based on the review of the 30 analyzed articles, it was evident that open defecation behavior is influenced by a wide range of individual, social, economic, and environmental factors. Each study applied different methodological approaches and research designs, including cross-sectional studies, analytical descriptive studies, spatial analysis, and multilevel regression. The diversity of research contexts, spanning Indonesia, Africa, and South Asia provides a comprehensive depiction of the determinants of open defecation behavior across various demographic, social, and cultural settings. A summary of the main characteristics of the thirty articles is presented in Table 1.

Table 1. Summary of literature review findings on determinants of open defecation behavior

Code	Authors (year)	Title	Place & subjects	Methods	Findings
P1	Ogunbamowo et al. (2024) [9]	Comparative Analysis between Open Defecation Practices and Environmental Health Status on Residents in Mainland Local Government Area, Lagos State	Lagos State, Nigeria. Respondents: 300 residents.	Design: quantitative descriptive. Sampling: simple random sampling. Analysis: linear regression ($\alpha = 0.05$).	Attitudes were significantly associated with open defecation behavior.
P2	Magaji et al. (2025) [10]	Threats to SDGs 3 and 6: Exploring Historical, Cultural, and Poverty-Related Drivers of Open Defecation in Rural Abuja, Nigeria	Abuja, Nigeria (rural). Respondents: 200 households.	Design: quantitative (cross-sectional) and qualitative (interviews and FGDs). Sampling: purposive. Analysis: chi-square and logistic regression.	Education, income, and cultural factors were significantly associated; sex and age were not.
P3	Meutia et al. (2025) [4]	Factors Influencing Open Defecation Behavior	Probolinggo, East Java, Indonesia. Respondents: 225 individuals.	Design: observational analytic (cross-sectional). Sampling: purposive. Analysis: chi-square and logistic regression.	Sex, age, occupation, and income were not significant. Education, attitudes, knowledge, latrine ownership, water availability, community leader support, and health worker roles were significant. Dominant factors: attitudes and latrine ownership.
P4	Juliansyah et al. (2025) [11]	Sociodemographic Factors Associated with the Use of Riverine Latrines	Sintang, West Kalimantan, Indonesia. Respondents: 278 individuals.	Design: quantitative cross-sectional. Sampling: not reported. Analysis: chi-square and odds ratio (95% CI).	Age ≤ 31 years and income $\leq$ minimum wage were significant. Sex and education were not.
P5	Adedotun et al. (2025) [12]	Residents' Socio-Economic Characteristics and Open Defecation in Osogbo, Osun State, Nigeria	Osogbo, Nigeria. Respondents: 240 households.	Design: quantitative descriptive and inferential. Sampling: multistage. Analysis: chi-square and MANOVA.	Education and sex were not significant. Age and marital status were significant.

Code	Authors (year)	Title	Place & subjects	Methods	Findings
P6	Yulia et al. (2024) [13]	Determinant Factors of Open Defecation Behavior in North Aceh	Tanah Pasir, North Aceh, Indonesia. Respondents: 351 households.	Design: quantitative cross-sectional. Sampling: cluster random. Analysis: chi-square and logistic regression.	Knowledge, attitudes, habits, economic level, and latrine ownership were significant. Dominant factor: latrine ownership.
P7	Muthukumaran et al. (2024) [14]	Open Defecation Among Adults Having Household Toilets	Rural Bihar, India. Respondents: 609 individuals.	Design: analytical cross-sectional. Sampling: cluster. Analysis: logistic regression.	Sex, caste, income, age of first latrine use, and government water supply were significant. Occupation and latrine condition were not.
P8	Lubis et al. (2024) [15]	Demographic Factors and Open Defecation Practices	Padang Lawas Utara, Indonesia. Respondents: 82 households.	Design: quantitative cross-sectional. Sampling: not reported. Analysis: chi-square and logistic regression.	Education, knowledge, attitudes, occupation, and income were significant.
P9	Ismail et al. (2024) [16]	Open Defecation Practice Among Households with Latrines	Somali Region, Ethiopia. Respondents: 632 households.	Design: cross-sectional. Sampling: multistage. Analysis: logistic regression.	Sex of household head, low education, >6 family members, child <5 years, dirty latrine, and latrine needing repair were significant.
P10	Lado et al. (2024) [17]	Factors Associated with Open Defecation Behavior	Kupang Tengah, Indonesia. Respondents: 77 households.	Design: analytical cross-sectional. Sampling: simple random. Analysis: chi-square and logistic regression.	Knowledge, attitudes, socio-economic status, and health worker support were significant. Water availability and village officer support were not.
P11	Birasa et al. (2024) [18]	Open Defecation Practice and Its Determinants	Gambela, Ethiopia. Respondents: 561 households with toilets.	Design: cross-sectional. Sampling: systematic random. Analysis: logistic regression.	Occupation, latrine condition, family size, knowledge, and attitudes were significant.
P12	Appiah-Effah et al. (2024) [19]	Determinants of Open Defecation Among Rural Women in Ghana	Rural Ghana. Respondents: 4,284 women aged 15–49.	Design: cross-sectional (DHS). Sampling: multistage cluster. Analysis: chi-square and logistic regression.	Education, wealth status, media access, and residence zone were significant. Age, occupation, marital status, and sex of household head were not after adjustment.
P13	Alemu et al. (2024) [5]	Prevalence and Associated Factors of Open Defecation	Geshiyaro Project Sites, Ethiopia. Respondents: 7,995 households.	Design: community-based cross-sectional. Sampling: census. Analysis: multivariate logistic regression.	Residence, education, occupation, age, marital status, family size, knowledge, and information exposure were significant. Sex and income were not.
P14	Sandy et al. (2023) [20]	Analysis of Open Defecation Factors	Pekanbaru, Indonesia. Respondents: 80 households (20 cases, 60 controls).	Design: case-control. Sampling: total (cases) and proportional random (controls). Analysis: chi-square.	Knowledge, attitudes, latrine ownership, water availability, and health worker roles were significant.
P15	Arisandi & Febriana (2023) [8]	Open Defecation Behavior and Social Environment	Sukaraja, Indonesia. Respondents: 95 households.	Design: cross-sectional. Sampling: not reported. Analysis: chi-square.	Knowledge, attitudes, social support, and health worker roles were significant. Culture was not.
P16	Roy et al. (2023) [6]	Spatial Clustering and Drivers of Open Defecation	India (NFHS-5).	Design: spatial analysis. Sampling: multistage stratified. Analysis: Moran's I, LISA, OLS, Spatial Lag, SEM.	Age, education, culture, attitudes, beliefs, wealth, water availability, latrine availability, and geography were significant.
P17	Paul (2023) [21]	Socio-Economic Factors Associated with Open Defecation	Haiti. Respondents: 1,269 agricultural households.	Design: cross-sectional. Sampling: stratified. Analysis: chi-square and logistic regression.	Geography, education, media access, organizational participation, agricultural plots, livestock, occupation, and agricultural income were significant. Sex, age, and family size were not.

Code	Authors (year)	Title	Place & subjects	Methods	Findings
P18	Damanik et al. (2023) [22]	Influence of Education, Income, and Knowledge on Latrine Use	Tanjung Balai, Indonesia. Respondents: 76 households.	Design: cross-sectional. Sampling: multistage random. Analysis: chi-square.	Education, income, and knowledge were significant.
P19	Azizah & Ardiansyah (2023) [23]	Attitudes, Knowledge, and Community Leader Support	Jakarta, Indonesia. Respondents: 142 households.	Design: cross-sectional. Sampling: simple random. Analysis: chi-square.	Attitudes, knowledge, and leader support were significant.
P20	Sinambela (2021) [24]	Determinants of Open Defecation Behavior	Humbang Hasundutan, Indonesia. Respondents: 117 households.	Design: descriptive-analytic. Sampling: simple random. Analysis: chi-square.	Knowledge, attitudes, distance to defecation site, and latrine ownership were significant. Age, family size, education, and income were not.
P21	Putra & Dewi (2022) [25]	Factors Associated with Open Defecation	Sekadau, Indonesia. Respondents: 84 households.	Design: cross-sectional. Sampling: proportional random. Analysis: chi-square.	Education, economic level, and culture were significant. Knowledge was not.
P22	Paul et al. (2022) [26]	Socio-Economic and Demographic Factors Influencing Open Defecation	Haiti (HDHS 2016–2017). Respondents: 13,405 households.	Design: cross-sectional. Sampling: stratified two-stage cluster. Analysis: chi-square and logistic regression.	Residence, geography, age, sex of household head, family size, number of children, education, wealth index, media access, and marital status were significant. Education and poverty were strongest predictors.
P23	Onyemaechi et al. (2022) [27]	Burden and Determinants of Open Defecation	Osun State, Nigeria. Respondents: 598 households.	Design: comparative cross-sectional. Sampling: multistage. Analysis: chi-square and logistic regression.	Residence, education of male household head, wealth index, and home ownership were significant.
P24	Amalia et al. (2022) [28]	Determinants of Open Defecation	Pekanbaru, Indonesia. Respondents: 125 households.	Design: cross-sectional. Sampling: simple random. Analysis: chi-square.	Knowledge, attitudes, income, and latrine ownership were significant. Health worker support was not.
P25	Namdev et al. (2022) [29]	Socio-Demographic Determinants of Open Defecation	Rural Bhopal, India. Respondents: 1,000 households.	Design: cross-sectional. Sampling: random. Analysis: chi-square and logistic regression.	Age, education, occupation, socio-economic status, marital status, and family type were significant. Sex was not.
P26	La Patilaya & Ishak (2022) [30]	Behavioral Determinants of Open Defecation-Free Families	Halmahera Selatan, Indonesia. Respondents: 145 families.	Design: cross-sectional. Sampling: proportional random. Analysis: chi-square.	Knowledge, attitudes, latrine ownership, water availability, health worker roles, and community leader roles were significant.
P27	Juliana et al. (2022) [31]	Factors Associated with STBM Pillar 1	Bener Meriah, Aceh, Indonesia. Respondents: 70 households.	Design: analytic cross-sectional. Sampling: simple random. Analysis: chi-square.	Knowledge, income, health worker roles, and latrine ownership were significant.
P28	Yulyani et al. (2021) [32]	Patterns and Determinants of Open Defecation	Bandar Lampung, Indonesia. Respondents: 377 individuals.	Design: cross-sectional. Sampling: questionnaire survey. Analysis: chi-square and regression.	Latrine ownership, land ownership, conative attitudes, and occupation were significant. Education and economic status were not significant after adjustment.
P29	Aulia et al. (2021) [33]	Open Defecation Behavior	Brebes, Indonesia. Respondents: 66 households.	Design: cross-sectional. Sampling: proportional random. Analysis: chi-square.	Attitudes, latrine ownership, and water availability were significant. Knowledge, health worker roles, education, and social support were not.
P30	Belay et al. (2022) [7]	Open Defecation Practice and Its Determinants	33 Sub-Saharan African countries. Respondents: 452,281 households.	Design: cross-sectional (DHS). Sampling: stratified two-stage cluster. Analysis: multilevel mixed-effects regression.	Age, education, media exposure, wealth, water access, rural residence, and region were significant.

Table 2. Distribution of determinant factors of open defecation behavior

Variable	Sub-Variable	Number of studies	Studies with significant association	Studies without significant association
Predisposing factors	Knowledge	16 (53%)	14 (88%)	2 (13%)
	Attitudes	15 (50%)	15 (100%)	0 (0%)
	Culture / habits	5 (17%)	4 (80%)	1 (20%)
	Sex	11 (37%)	3 (27%)	8 (73%)
	Education level	19 (63%)	14 (74%)	5 (26%)
	Occupation	9 (30%)	6 (67%)	3 (33%)
	Income	11 (37%)	8 (73%)	3 (27%)
	Age	13 (43%)	8 (62%)	5 (38%)
	Marital status	5 (17%)	4 (80%)	1 (20%)
	Family size	7 (23%)	5 (71%)	2 (29%)
	Socio-economic / wealth index	8 (27%)	8 (100%)	0 (0%)
Enabling factors	Media access	5 (17%)	5 (100%)	0 (0%)
	Economic level	4 (13%)	3 (75%)	1 (25%)
	Geographic location	8 (27%)	8 (100%)	0 (0%)
	Latrine availability	10 (33%)	10 (100%)	0 (0%)
	Water availability	8 (27%)	7 (88%)	1 (13%)
	Latrine condition	3 (10%)	2 (67%)	1 (33%)
Reinforcing factors	Social support / community leaders	7 (23%)	5 (71%)	2 (29%)
	Health worker roles	8 (27%)	7 (88%)	1 (13%)

Within the predisposing factors, the most frequently studied variables included education level, knowledge, attitudes, age, sex, income, occupation, socio-economic status or wealth index, family size, marital status, and cultural or habitual practices. Among these variables, education level appeared most frequently, followed by knowledge and attitudes. Most studies examining knowledge, attitudes, cultural or habitual practices, education level, occupation, income, age, marital status, and socio-economic status reported significant associations with open defecation behavior. In contrast, most studies analyzing sex reported no significant association.

Within the enabling factors, latrine ownership, water availability, and geographic location were the most frequently analyzed variables. The majority of studies that included these variables reported significant associations with open defecation behavior.

Within the reinforcing factors, social support or community leader influence and the role of health workers were the most frequently studied variables. Most studies reported significant associations for these two variables, although a few studies found no significant relationship.

DISCUSSION

The literature demonstrates that open defecation behavior does not occur in isolation; rather, it emerges from the interaction of multiple factors operating simultaneously at the individual, household, and community levels. Within the group of predisposing factors, knowledge and attitudes appear as the most consistently associated variables influencing sanitation behavior. Individuals who possess adequate knowledge regarding the health risks and environmental consequences of open defecation tend to adopt safer sanitation practices [4,5,8,13,15,17,18,20,22–24,28,30,31]. Limited knowledge is frequently linked to low educational attainment, which restricts an individual's ability to receive, comprehend, evaluate, and analyze information, including information necessary to assess the positive or negative implications of sanitation behavior [4–7,10,15,16,19,21,22,25–27,29].

However, education alone is not the sole determinant of behavioral formation. Higher educational attainment does not automatically translate into better understanding of open defecation behavior, nor does it guarantee that individuals will apply the knowledge they possess in daily practice [11,12,24,32,33]. In one study, attitudes were examined as the only variable associated with open defecation behavior, and although attitudes were found to be related, the strength of the association was relatively weak [9]. This finding suggests that attitudes do contribute to the persistence of open defecation, yet they are insufficient to drive behavioral change unless accompanied by other factors such as adequate knowledge or supportive environmental conditions. Conversely, studies that examined attitudes alongside knowledge and education reported stronger and more consistent associations. This indicates that attitudes often develop through the integration of knowledge and education, making behavioral change more likely when these three components operate simultaneously [4,15].

Socio-economic factors, including income, occupation, and wealth index also play an important role. Socio-economic status reflects an individual's capacity to meet basic needs based on income and type of occupation. Economic conditions influence the ability to provide sanitation facilities, including latrine availability; thus, individuals with lower socio-economic status are more likely to practice open defecation compared to those with higher socio-economic status [15,21]. Meanwhile, studies that did not find an association between socio-economic status and open defecation suggest that economic conditions are not always the dominant factor. In such contexts, individuals with low income may still avoid open defecation if they possess adequate knowledge and positive attitudes. Even among higher-income groups, open defecation may persist if individuals lack the willingness or motivation to construct and use latrines [4,24].

These findings further illustrate that changes in open defecation behavior are not solely driven by rational aspects such as knowledge or economic status, but also by cultural or habitual factors. The review shows that one of the primary reasons communities continue practicing open defecation is the presence of long-standing habits passed down across generations. Behavioral patterns repeated over many years create a sense of comfort, making open defecation appear easier and more practical than using a latrine [6,10,13,25].

Several demographic factors, including age, marital status, and family size also influence open defecation practices. The relationship between age and open defecation varies across studies. Some research indicates that adolescents and late adolescents are more likely to practice open defecation [5,7,26], whereas other studies report that young adults are also at risk [6,11,12,14]. However, many studies found no significant association between age or sex and open defecation behavior, suggesting that these factors may be context-specific and shaped by local social and cultural structures [4,10,19,21]. Marital status also plays a role through household responsibilities; married individuals, particularly household

heads, tend to consider family health more seriously, although this remains dependent on economic conditions and knowledge [5,26,29]. Family size contributes as well, as larger households face challenges in maintaining sanitation facilities and managing high usage levels, which may lead members to practice open defecation when latrines are inadequate or poorly maintained [16,18].

Within the enabling factors, the availability of sanitation facilities, access to clean water, and geographic location emerge as the strongest and most direct determinants of open defecation. Latrine ownership is a critical factor because without adequate facilities, positive attitudes and good knowledge cannot be translated into actual behavior. The analysis shows that individuals without latrines are more likely to practice open defecation [4,6,13,20,24,28,30,31]. Lack of latrine availability is commonly found among low-income communities, who prioritize basic needs over latrine construction due to perceived high costs. Clean water availability is also essential for sustaining latrine use; when water supply is limited, communities tend to revert to open defecation [4,6,20,30,33]. The physical condition of latrines, whether clean, safe, and functional also affects user comfort, and several studies found that damaged or poorly maintained latrines reduce community willingness to use them [16,18].

Geographic location further influences sanitation behavior. Communities living in remote areas, riverine regions, or locations with limited accessibility face greater challenges in abandoning open defecation due to restricted sanitation infrastructure. Some studies show that geographic location not only affects sanitation facility availability but also determines access to media and health information. Communities in remote or rural areas often have lower media exposure, limiting their access to sanitation messages. This explains why both geographic location and media access appear as determinants of open defecation behavior in several studies [5,7,19,21,26].

Reinforcing factors highlight the critical role of social and institutional actors in promoting sanitation behavior change. Social support strengthens individual motivation through normative pressure and social reinforcement, particularly in communities where open defecation is deeply rooted. When community leaders endorse latrine use, emerging norms can accelerate the adoption of improved sanitation practices. Similarly, health workers play an essential reinforcing role through education, guidance, and routine monitoring, encouraging individuals to maintain healthy behaviors. Without support from these actors, behavioral change tends to be unsustainable, especially in communities where open defecation remains a strong cultural tradition or habitual practice [4,8,30].

Overall, the findings indicate that open defecation is a multifactorial phenomenon that cannot be explained by a single determinant. The interaction between predisposing factors, individual and household capacity to access sanitation facilities, and social environmental support collectively determines the success of efforts to reduce open defecation. Therefore, programs focusing solely on latrine provision or knowledge improvement are insufficient to achieve comprehensive behavioral change. A holistic approach integrating education, sanitation infrastructure improvement, and strengthened social support is required to ensure sustainable behavioral transformation.

This study has several limitations that should be considered when interpreting the findings. First, the narrative literature review design relies on descriptive synthesis, which may introduce subjectivity in interpreting findings across studies. Second, the literature sources were limited to selected major databases and specific publication years, raising the possibility that relevant studies outside these databases were not identified. Third, variations in social, cultural, economic, and sanitation contexts across study locations mean that findings may not be fully generalizable to all regions with different characteristics. Nevertheless, the conclusions of this review provide a comprehensive understanding of how open defecation behavior results from the interaction of three major determinant groups: predisposing factors, individual and household capacity to access sanitation facilities, and social environmental support.

CONCLUSION

The findings indicate that open defecation behavior is shaped by three principal groups of determinants: predisposing factors (particularly education, knowledge, attitudes, and socio-economic status), enabling factors (including latrine availability, access to clean water, and geographic conditions), and reinforcing factors (such as community leader support and the role of health workers). Together, these results underscore that open defecation is not merely a matter of infrastructure availability but a complex behavioral phenomenon requiring integrated interventions across individual, environmental, and social domains to achieve sustainable progress toward Open Defecation Free (ODF) conditions.

Ethical consideration, competing interest and source of funding

- This study did not require ethical clearance because it synthesized publicly available published research, and all included studies were properly cited with full author, title, and publication details.
- There is no conflict of interest related to this publication.
- Source of funding is authors.

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