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SYSTEMATIC REVIEW & META-ANALYSIS

Prevalence of high risk fertility behavior and associated factors among reproductive-age women in low-and middle-income countries: a systematic review and meta-analysis

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Abstract

Background: High-risk fertility behaviors (HRFB) are common in low- and middle-income countries (LMICs). A significant proportion of women, particularly in LMICs, are experiencing HRFB. Globally, around 77% of currently married women are susceptible to HRFB.

Objective: To synthesize the prevalence of high-risk fertility behavior and associated factors among reproductive-age women in low- and middle-income countries.

Methods: We extensively searched the electronic databases of MEDLINE, PubMed, Scopus, Web of Science, and Google Scholar to obtain eligible studies. Operationalize response variable. The data were extracted using Excel Spreadsheet, then imported into Stata^{TM} version 17 for analysis. To assess heterogeneity, Cochran's Q tests and the Higgins I^2 were employed. Subgroup analysis and sensitivity were conducted. To detect publication bias, funnel plots and Egger's test were used.

Results: The pooled prevalence of high-risk behavior among reproductive-age women in LMICs was 58.6% (95% CI: 49.8, 67.4%). Being a rural resident (pooled odds ratio (POR) = 1.82 95% CI: 1.44, 2.21), having primary education (pooled odds ratio (POR) 0.656; 95% CI: 0.492 -0.819), secondary education (pooled odds ratio (POR) 0.407; 95% CI: 0.233-0.582), being Muslim (pooled odds ratio (POR) 1.824 ; 95% CI: 1.474-2.174), having intention to pregnancy (pooled odds ratio (POR) 4.317 ; 95% CI: 2.821-5.814), contraceptive use (pooled odds ratio (POR) 0.745; 95% CI: 0.719 -0.770), and vaginal delivery (pooled odds ratio (POR) 1.552; 95% CI1.501-1.602), were significantly associated with high risk fertility behavior.

Conclusions: The pooled magnitude of high-risk fertility behavior was high factors such as living in rural, being primary or secondary educational status, being Muslim, having intention to pregnancy, contraceptive use, and vaginal delivery, were significantly associated with high risk fertility behavior.

Keywords: Fertility behavior, High-risk fertility behavior, Maternal health, Reproductive health

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1 Background

High-risk fertility behaviors (HRFB), defined as pregnancy occurring too-early (< 18 years) or too-late (> 34 years) childbearing, short birth intervals (< 24 months) and a higher number of live births (4 or higher) are common in low and middle income countries (LMICs) [1]. Women's HRFB, have been scientifically reported to have detrimental effects on the mother's and child's health [2].

The swift increase in population growth is expected to lead to significant challenges, such as insufficient infrastructure such as housing, depletion of natural resources, schools, and healthcare facilities, rising unemployment [3, 4]. Recent research indicates that a significant proportion of women, particularly in LMICs, are experiencing HRFB. Globally, around 77% of currently married women are susceptible to HRFB, with 31% falling into a single high risk category and 45% into multiple high-risk categories [5].

Regionally, Chad exhibits a single-high risk fertility behavior prevalence of 82.86%, compared to 45.42% in South Africa [3]. By the year 2030, every country is expected to decrease the maternal mortality ratio (MMR) by a minimum of two-thirds from their 2010 baseline figures. The global average target aims for an MMR of less than 70 per 100,000 live births by 2030 [6, 7].

Women's fertility behaviors are influenced by factors such as maternal age, birth spacing, and birth order, all of which have implications for the health of both mothers and their children [8]. Socio-demographic factors can influence high-risk fertility behaviors. For instance, early pregnancies are more prevalent in rural areas than in urban settings [9]. Additionally, factors such as religion, educational attainment, and marital status are linked to these risky behaviors [10]. Likewise, reproductive health factors, including a history of child mortality, the use of healthcare facilities for delivery, and engagement with family planning services, also play a significant role in determining high-risk fertility behaviors [11, 12].

Sustainable Development Goal (SDG) 3, specifically target 3.1, aims to reduce maternal mortality to below 70 deaths per 100,000 live births by the end of 2030 [3]. However, the prevalence of single-high risk fertility behavior poses significant challenges to achieving this goal, and it remains under-researched area.

Various studies in the literature indicate a connection between birth intervals and high-risk fertility behaviors. Specifically, when the interval between births is less than 24 months, there is a significant increase in the risk of child mortality compared to longer birth intervals [13]. This issue is particularly pronounced in LMICs, where access to healthcare services is limited, socioeconomic conditions are poor, and there is a substantial unmet need for family planning [14]. Additionally, early marriage among women contributes to the prevalence of high-risk fertility issues in LMICs [**??**, 15].

However, there is a lack of evidence regarding the extent of high-risk fertility behaviors and their associated factors in LMICs. The findings of this systematic review and meta-analysis will assist policymakers in formulating strategies aimed at further reducing high-risk fertility behaviors [7]. Thus, this study sought to synthesize the prevalence of high risk fertility behavior and associated factors among reproductive-age women in low- and middle-income countries.

2 Methods and Materials

2.1 Study design, setting, and search strategy

A systematic review and meta-analysis were employed to determine the pooled magnitude of HRFB and associated factors among reproductive-age women in LMICs. This systematic review and meta-analysis study was undertaken following the preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

All primary and secondary studies that investigated the magnitude of HRFB and associated factors among reproductive-age women in LMICs were used to conduct this meta-analysis. This systematic review and meta-analysis study

was registered in PROSPERO with reference ID CRD 42025643277. This review study took place between February 18 to March 5, 2025.

The search strategy for this review has been conducted in two ways. Electronic databases including Medline, Scopus, Web of Science, PubMed, and Google Scholar were searched for identifying studies reporting magnitude of high risk fertility behavior and associated factors among reproductive-age women in LMICs.

An electronic databases search was conducted in line with database-specific searching guidelines using keywords used in PubMed. The second strategy was a manual search for the reference lists of the incorporated studies published within the last ten years (from 2015 to 2025) in settings of LMICs. We expanded our search by exploring cross-references to obtain more literature. The articles were downloaded, reviewed, organized, and collated using EndNote reference management software for Windows.

Research questions to this study were framed, organized, and answered using the population, exposure, comparator, and outcome (PICO) framework [19]. Population refers to women of reproductive age, exposure refers to associated factors with HRFB, comparator refers to the reference group reported in the included studies, and outcome refers to the prevalence of HRFB.

A literature search was held from February 18 to March 5, 2025. To search the articles, we used the combination of key search terms as follows: 'Fertility risk factors' OR 'Socioeconomic factors in fertility behavior' OR Behavioral patterns in fertility OR Socioeconomic status and fertility behavior AND ('associated factors' OR 'determinants' OR 'predictors') AND ('women' OR 'among reproductive age women') AND ('low and middle income countries').

2.2 Inclusion and exclusion criteria

An article was eligible for inclusion if it met the following criteria: The study had been conducted in reproductive-age women, the outcome investigated should be high risk fertility behavior and its associated factors, the study should be conducted in low and middle income countries and the study conducted from 2015 to 2025.

An article was eligible for exclusion if it meets the following criteria: Publication of the article in Non-English language and Previous studies which assessed non-human subjects.

2.3 Outcome measurement and operational definitions

There were two main outcomes. The first outcome of interest the pooled prevalence of high risk fertility behavior and associated factors. From primary studies, high risk fertility behavior preference was operationalized as the choice or desire, or intention of women to give birth too-early (< 18 years) or too-late (> 34 years) childbearing, short birth intervals (< 24 months) and a higher number of live births (4 or higher). The second outcome was the factors associated with high risk fertility behavior, which was calculated based on binary outcomes from the included primary studies using the odds ratio (OR). The variables included in the review were ANC Visit, wealth index, knowledge of contraceptive, age, religion, delivery mode, pregnancy intention, contraceptive use, residence, educational status, husband educational status, and wealth index.

2.4 Methods for data extraction and quality assessment

The two authors (Y.A & GN) independently extracted the essential data from the studies included in the final analysis using a Newcastle–Ottawa Scale (NOS) template. The second author (G.K) arranged and facilitated discussions to resolve any differences and disagreements.

A standardized excels spreadsheet Microsoft for Windows was used to enter the data that had been extracted from the included research. To maintain consistency, cross-checking was done. During the extraction process, discrepancies between the extracted data were resolved through logical discussion among the two authors, and the final consensus was approved with the participation of authors.

The table includes the author's name, the sample size, the research population, the study area, the study design, the publication year, and the evaluation tool for high risk fertility behavior and associated factors among reproductive-age women:

Utilizing a PRISMA-compliant assessment form, the data from the included studies was collected [16]. We also assessed the methodological quality of included studies using a modified version of the Newcastle–Ottawa Scale (NOS) for cross-sectional studies which includes key criteria sample size, sample representativeness, response rates, controlling confounders, outcome determination, and appropriateness of statistical tests [21].

This scale provides potential scores between 0 and 10, with a score of 8 or higher indicating good quality, a score ranging from 3 to 7 indicating moderate quality, and a score below 3 indicating low quality. Two independent reviewers (YA and GN) evaluated the quality of the included studies using the Newcastle-Ottawa quality assessment scale [17]. Any disagreements were discussed and resolved by the third invited researcher for this purpose. Among the fourteen studies evaluated, ten were determined to have moderate quality, while four were classified as having good quality.

2.5 Data processing and analysis

Meta-analysis was computed after importing the extracted data into STATA 17 software. A random effects meta-analysis model was used to estimate the pooled values of high risk fertility behavior by generating the pooled 95% confidence interval (22,23). The results of the meta-analysis were displayed on a forest plot. The amount and degree of heterogeneity across included studies were assessed using a Cochran's Q-test and inverse-variance (I^2) statistical test, respectively. The I^2 statistical test measures the percentage of total variation among studies influencing effect size. When the I^2 statistical value is zero, there is no heterogeneity; I^2 values of 25, 50, and 75%, respectively, imply small, moderate, and large heterogeneity [18]. Effect size was expressed as percentage and odds ratio (OR). To identify possible sources of heterogeneity, a univariate meta-regression was computed. Publication bias was checked using a Funnel plot and Egger's test at p-values less than 0.05 significant levels [24, 25].

3 Results

3.1 Characteristics of included studies

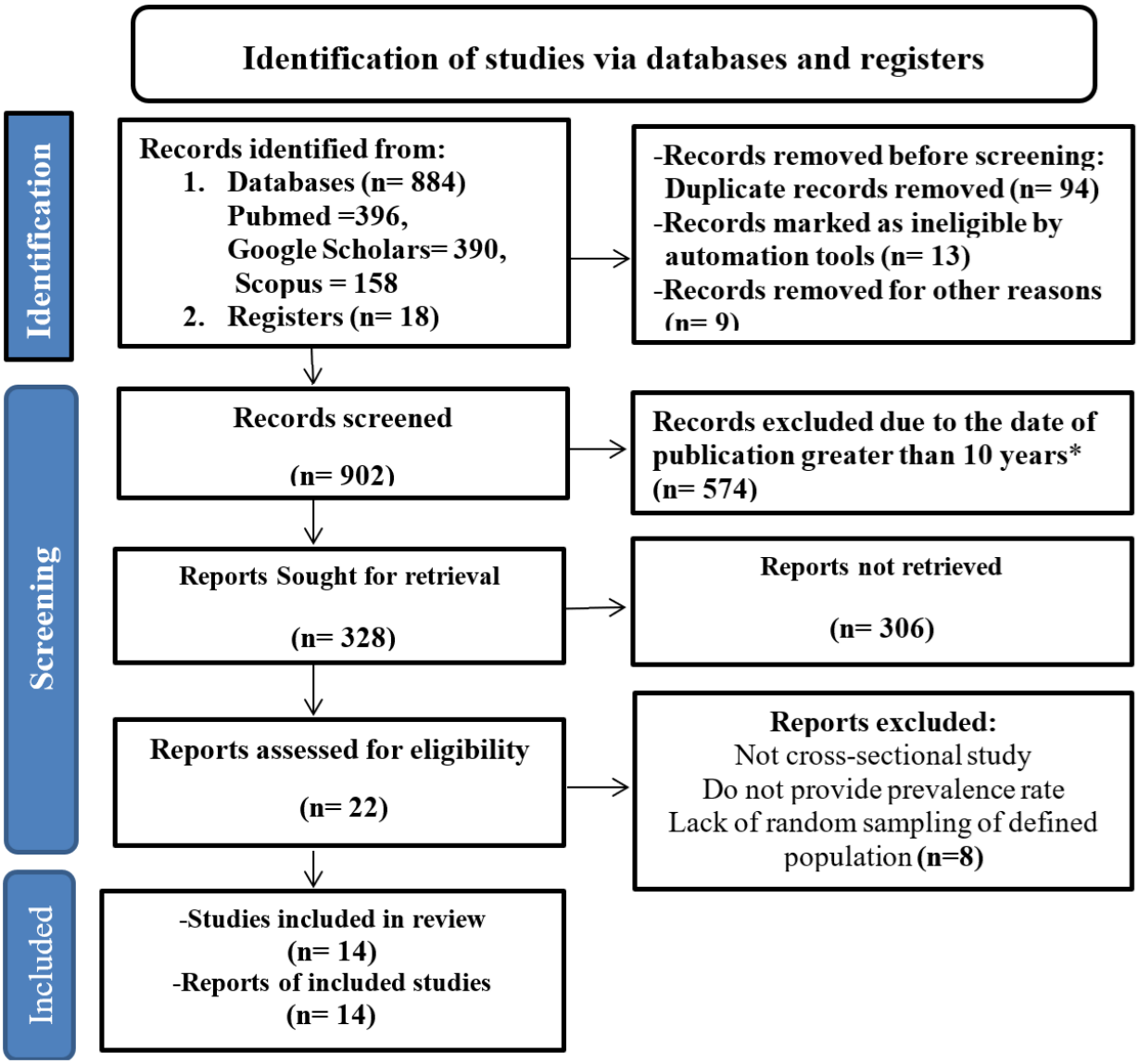


Figure 1 Flow chart for the review process identification of studies *Date of publication greater than 10 years

3.2 Identification of studies

A total of 14 studies that examined 482,819 high risk fertility behaviors among reproductive-age women in low and middle income countries were included in this systematic review and meta-analysis study [1-3, 7, 19-28]. Half or seven studies were from Ethiopia [3, 7, [24-28] three studies from Bangladesh [1, 19, 20] two studies from India [21, 23] and one study from Congo [22] and one study Kenya [2]. All studies applied cross-sectional study design.

Most or 6 of the studies belong to a sample size less than <10,000 [1, 3, 25-28] whereas 5 studies had sample size range from ≤10,000-20,000 [2, 7, 20, 22, 24] and the rest 3 studies had a sample size ≥ 20,000.The study design of all studies was cross-sectional.

Regarding the publication year 10 studies published in the last five year [1-3, 21, 22, 24-28] and the rest 4 studies [3, 21, 22, 24] published between 2019 and 2021 (Table 1).

Table 1 Characteristics of included studies on high risk fertility behavior among reproductive-age women in low and middle income countries (Study design: Cross—sectional study; Outcome variable: High risk fertility behavior)

S.No.	Author/ Year	Study country	Sample size	% high risk behavior
1	Yishak Sinebo *et al.* 2025	Ethiopia	2,47	67.3
2	Md. Hasan Howlader *et al.* 2020	Bangladesh	20,100	67.7
3	Mosfequr Rahman *et al.* 2019	Bangladesh	17,863	34.0
4	Zemenu Tadesse *et al.* 2020	Ethiopia	11,022	76.9
5	Pooja Singh *et al.* 2024	India	176,567	29.5
6	Zacharie Tsala *et al.* 2023	Congo	11,497	68.5
7	Sanjay Kumar Pal *et al.* 2021	India	190,581	32.0
8	Melash Belachew Asresie *et al.* 2022	Ethiopia	10,773	62.1
9	Md. Nuruzzaman, *et al.* 2023	Bangladesh	8,930	46.0
10	Fantu Mamo Aragaw, *et al.* 2023	Ethiopia	5,846	73.5
11	Berhanu Teshome *et al.* 2023	Ethiopia	5,846	72.8
12	Beminate Lemma Seifuet *et al.* 2023	Kenya	15,483	70.8
13	Eshetu Gurmu1 *et al.* 2023	Ethiopia	7,764	58.7
14	Samuel Kusheta1 *et al.* 2024	Ethiopia	3,00	60.3

3.3 The pooled prevalence of high risk fertility behavior among reproductive-age women in low- and middle-income countries

Fourteen studies that assessed high risk behavior among reproductive age women were included in the final meta-analysis to determine the pooled prevalence of high risk behavior among reproductive age women. The reported magnitude of high risk behavior among the studies included in the current systematic review and meta-analysis varies from 29.5 in India [7] to 76.9% in Ethiopia [21].

The pooled prevalence of high risk behavior among reproductive-age women in LMICs using the random effect model was 58.6% (95% CI 49.8 –67.4). This pooled prevalence was under the influence of significant heterogeneity (I^2 = 96.86%, p-value) from the variance between the included studies (Figure 2).

3.4 Sub group analysis of prevalence of high risk fertility behavior among reproductive-age women in low and middle income countries

Since the pooled prevalence of high risk fertility behavior was influenced by substantial heterogeneity, a subgroup analysis has been employed based on sample size <10,000 or ≤10,000-20,000 or ≥ 20,000, World bank country classifications by income level (low or Middle income countries), and Study settings (Table 2).

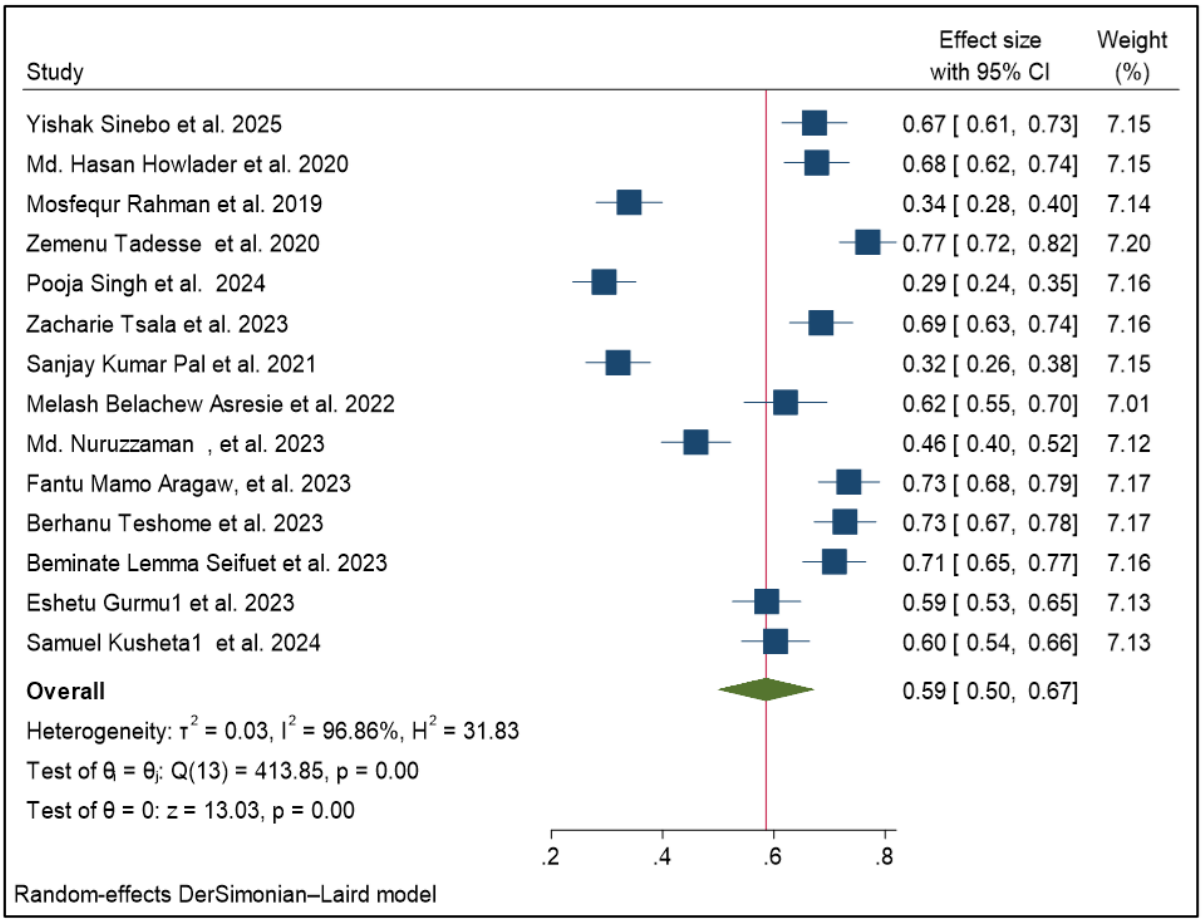


Figure 2 A forest plot for the prevalence of high risk fertility behavior among reproductive-age women

Table 2 A subgroup analysis of the prevalence of high risk fertility behavior among reproductive-age women in low and middle income countries

Subgroup	Number of studies	Estimates		Heterogeneity		
		Prevalence (%)	95%CI	I^2 (%)	Q(DF)	P-value
Sample size						
<10,000	6	0.632	0.549 - 0.714	91.50	58.86 (5)	<0.001
≤10,000-20,000	5	0.625	0.475 - 0.775	96.93	130.27 (4)	<0.001
≥ 20,000	3	0.431	0.190 - 0.671	98.08	104.42 (2)	<0.001
World bank country rank						
Low income	12	0.633	0.562 - 0.703	94.23	190.65 (11)	<0.001
Middle income	2	0.307	0.267 - 0.348	0.00	0.36 (1)	0.546
Study setting						
Facility based	2	0.639	0.570 - 0.707	62.04	2.63 (1)	0.105
Community based	12	0.577	0.475 - 0.679	97.29	405.71 (11)	<0.001

3.5 Sensitivity analysis

To detect the source of heterogeneity that affects the pooled prevalence of high risk fertility behavior in reproductive-age women, we conducted a sensitivity analysis. Based on the findings of the sensitivity analysis, the pooled estimated prevalence of high risk fertility behavior obtained when each study was omitted from the analysis within the 95% confidence interval of the pooled prevalence of high risk fertility behavior when all studies were fitted together. The sensitivity analysis findings revealed that the pooled prevalence of high risk fertility behavior ranges between 57.2% (95% CI: 48.2, 66.2%) and 60.8% (95% CI: 52.7, 69.0%) when each study was left out of the analysis (Table 3).

Table 3 A sensitivity analysis of the prevalence of high risk fertility behavior among reproductive-age women in low and middle income countries when each indicated studies are removed at a time with its 95% confidence interval

S.No.	Excluded study	Prevalence of high fertility behavior (%)	95%CI
1	Yishak Sinebo *et al.* 2025	57.9	48.5 - 67.4
2	Md. Hasan Howlader *et al.* 2020	57.9	48.5 - 67.3
3	Mosfequr Rahman *et al.* 2019	60.5	51.9 - 69.1
4	Zemenu Tadesse *et al.* 2020	57.2	48.2 - 66.2
5	Pooja Singh *et al.* 2024	60.8	52.7 - 69.0
6	Zacharie Tsala *et al.* 2023	57.8	48.4 - 67.2
7	Sanjay Kumar Pal *et al.* 2021	60.7	52.2 - 69.1
8	Melash Belachew Asresie *et al.* 2022	58.3	49.0 - 67.7
9	Md. Nuruzzaman, *et al.* 2023	59.6	50.3 - 68.8
10	Fantu Mamo Aragaw, *et al.* 2023	57.4	48.2 - 66.7
11	Berhanu Teshome *et al.* 2023	57.5	48.2 - 66.8
12	Beminate Lemma Seifuet *et al.* 2023	57.7	48.3 - 67.0
13	Eshetu Gurmu1 *et al.* 2023	58.6	49.1 - 68.1
14	Samuel Kusheta1 *et al.* 2024	58.5	49.0 - 68.0

CI: Confidence Interval

3.6 Publication bias

The presence or absence of publication bias in the high risk fertility behavior was checked with two approaches. The first was a visual inspection of a funnel plot for a Logit event rate of prevalence of high risk fertility behavior (Figure 3) in reproductive age women against its standard error suggests opposite evidence for the existence of publication bias. Moreover, Egger's publication bias plot showed that publication bias did not exists and that its p-value is not significant (P-value = 0.592) for high risk fertility behavior, implying that there is not significant publication bias for the prevalence of high risk fertility behavior in low and middle income countries (Figure 3).

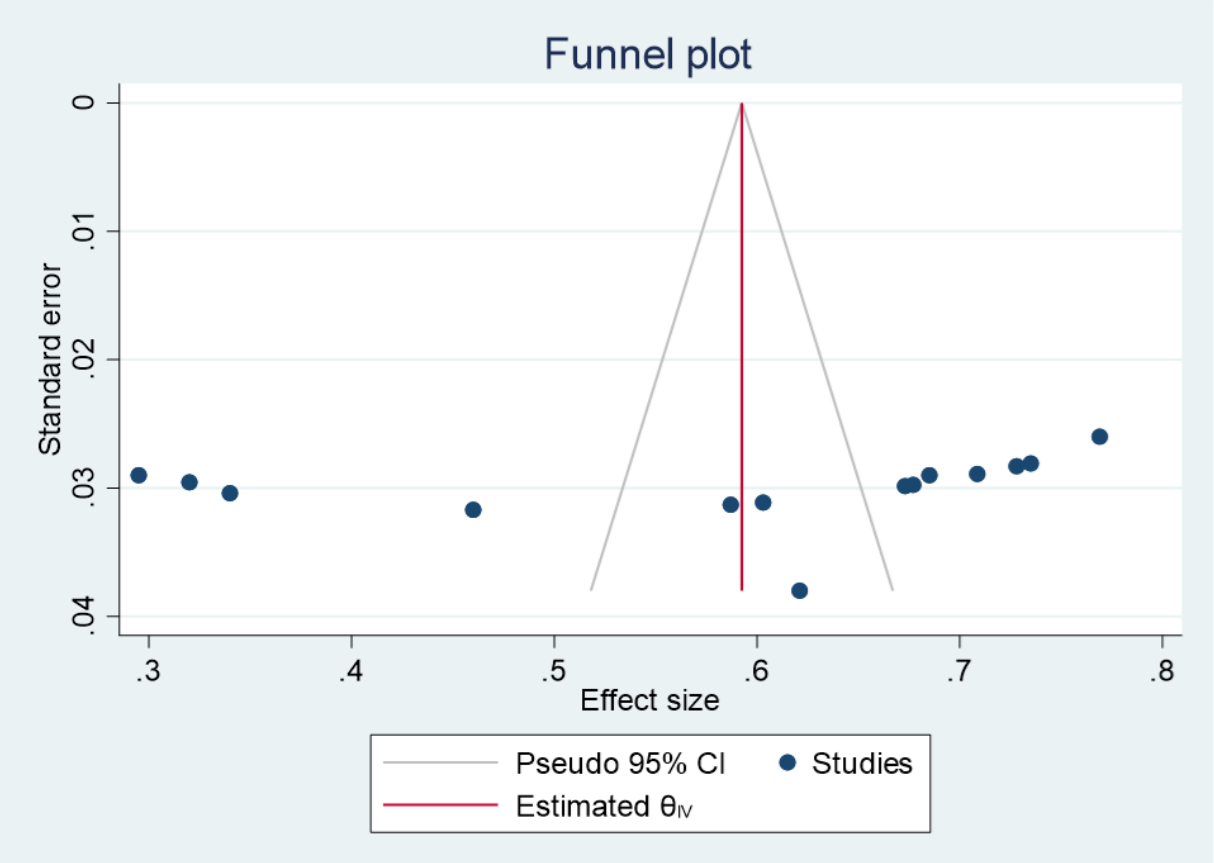


Figure 3 A funnel plot for the prevalence high risk fertility behavior in reproductive age women

3.7 Factors associated with high-risk fertility behavior in reproductive age women in low- and middle-income countries

Nine studies reported factors associated with high risk fertility behavior [2, 3, 7, 19, 21-23, 25, 26, 28]. The pooled effect of five studies [2, 7, 21, 25, 28] showed that reproductive age women living in rural area were 1.82 times (AOR 1.82; 95% CI: 1.43–2.21) more likely to exposed to high risk fertility behavior in LMICs as compared to women living in urban settings. The pooled effect of six studies [2, 7, 21, 22, 25, 26] showed that reproductive age women attended primary and secondary education were 65.6% times (AOR 0.656; 95% CI: 0.492 –0.819) and 40.7% times more likely to exposed to high risk fertility as compared to reproductive age women who did attended any formal education respectively. The pooled effect of five studies [2, 7, 19, 21, 25] showed that Muslim religion followers were 1.82 times (AOR 1.82; 95% CI: 1.47, 2.17) more likely experience high risk fertility behavior as compared reproductive age women who did not follower of Muslim religion (Table 4).

Table 4 Characteristics of pooled associated factors with prevalence of high risk fertility behavior among reproductive-age women

Variables	AOR	95%CI	P value
Living in rural	1.826	1.437 - 2.216	<0.001
Being primary education	0.656	0.492 - 0.819	<0.001
Being secondary education	0.407	0.233 - 0.582	<0.001
Being Muslim	1.824	1.474 - 2.174	<0.001
Having intention to pregnancy	4.317	2.821 - 5.814	<0.001
Contraceptive use	0.745	0.719 - 0.770	<0.001
Vaginal delivery	1.552	1.501 - 1.602	<0.001

4 Discussions

The pooled prevalence of high-risk behavior among reproductive-age women in low- and middle-income countries using the random effect model was 58.6%. This pooled prevalence was under the influence of significant heterogeneity ($I^2 = 96.86\%$, p-value) from the variance between the included studies. The reported magnitude of high risk behavior among the studies included in the current systematic review and meta-analysis varies from 29.5 in India [7] to 76.9% in Ethiopia [21]. The sensitivity analysis findings revealed that the pooled prevalence of high risk fertility behavior ranges between 57.2 (95% CI 48.2 - 66.2) and 60.8 % (95% CI 52.7, 69.0) when each study was left out of the analysis.

The current study pooled prevalence of high risk behavior among reproductive-age women (58.6%) was similar in one study [27], lower in four studies [1, 20, 21, 23] and higher in nine studies [2, 3, 7, 19, 22, 24-26, 28] This high pooled prevalence of 58.6% underscores a critical public health challenge in LMICs and must be contextualized against global reproductive health frameworks. The World Health Organization (WHO) and the United Nations Population Fund (UNFPA) emphasize that mitigating high-risk fertility behaviors (HRFB)—specifically maternal age too young (<18 years) or too old (> 34 years), short birth intervals (< 24 months), and high parity (≥ births)—is a fundamental prerequisite to achieving Sustainable Development Goal (SDG) Target 3.1, which aims to reduce the global maternal mortality ratio (MMR) to less than 70 per 100,000 live births by 2030 [29]. Because HRFB is directly linked to severe obstetric complications, our finding that more than half of reproductive-age women in LMICs experience at least one high-risk fertility behavior explains why regional maternal mortality remains disproportionately high. Furthermore, global family planning benchmarks indicate that high magnitudes of HRFB strongly correlate with a high unmet need for family planning and low modern contraceptive prevalence rates (mCPR) in sub-Saharan Africa and South Asia, reflecting broader regional trends where structural gaps in reproductive healthcare supply chains and services persist.

In this study those study participants who lived in rural settings were more likely to experience high risk fertility behavior. These findings were similar with a study done in Kenyan, Bangladesh and Ethiopia [2, 20, 26, 27]. The reason for this discrepancy might be early marriage is common in rural area; in addition in rural settings there is a low literacy level, highly disadvantaged in terms of reproductive health services, and the society was more tied religious beliefs and community attitude of high fertility behavior. Socioeconomically disadvantaged women, particularly those in remote or rural locations, face compounding barriers, including poor healthcare infrastructure, physical distance to clinics, and financial constraints, which restrict their ability to utilize maternal care services.

Women with no formal education had a higher risk of HRFB than women with primary, secondary and tertiary education this finding was

supported by other studies [14, 30, 31]. Education acts as a powerful tool of empowerment, enabling women to understand reproductive risks, negotiate family planning with partners, and resist traditional societal pressures for large families [26].Every additional year of schooling has been shown to progressively reduce the odds of experiencing HRFB by improving contraceptive awareness and delaying childbearing [32].

The possible explanation for this could be educated women were more probably delay marriage, engage with healthcare providers effectively and negotiate family planning with their partners, educated women look for quality children than a large number of children moreover, they that have the power to resist cultural influence in traditional societies that request large family size.

In this study religious beliefs have been shown to significantly influence HRFB among reproductive age women; religion has enormous social relevance in most societies. Our study revealed that women, who were Muslims, have increased odds of HRFB compared with other religious followers [25]. However, this statistical association requires careful, localized contextualization to avoid theological overgeneralization. In many of the analyzed LMIC settings, religion serves as a proxy for intersecting cultural, economic, and educational structures rather than acting as an independent theological driver. Sociocultural dynamics, such as patriarchal family dynamics, low female economic autonomy, and localized interpretations of family planning by religious leaders, heavily mediate reproductive choices [33]. For example, studies on family planning uptake in highly religious settings highlight that resistance is often driven by patriarchal decision-making structures and community-level norms rather than strict theological prohibitions [33]. When women face limited access to literacy and formal employment, high parity and early marriage remain the default societal expectations. Thus, public health programs must move away from direct theological attribution and instead engage local religious and cultural institutions as allies. Utilizing tailored, community-led behavioral change communication can bridge the gap between religious values and family planning acceptance.

The strengths and limitations

The study included both community based and facility based study. Large and nationally representative data was included in this study. However, this study has faced the following limitations due to cross-sectional data, predictors and outcomes variables were collected at a point of time; therefore, causality cannot be established. The data of this study had problems of recall bias, since this survey relies on respondents' self-report, there may be a chance of recall bias.

5 Conclusion

The pooled magnitude of high risk fertility behavior was high, and factors like living in rural, being primary or secondary education, being Muslim, having intention to pregnancy, contraceptive use, and vaginal delivery, were significantly associated with high risk fertility behavior. Understanding high-risk fertility behaviors requires a multifaceted approach like individual, cultural, and health care facility accessibility. Continuous research is crucial for creating effective strategies that encourage safe reproductive behaviors and enhance overall public health results.

Competing interests

The authors declare that they have no competing interests.

Author Contributions

YAW is involved in conceptualization, and designing the study. YAW, GN, AS, and EA were responsible for designing the study, data analysis, interpretation of the result, drafting manuscript, and critically revised the manuscript, approved the final version of manuscript for publication, and selected the target journal. All authors reviewed and accepted the responsibility for the integrity of the work.

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References

1. Khan, M.N. and M.L. Harris, Association between maternal high-risk fertility behaviour and perinatal mortality in Bangladesh: Evidence from the Demographic and Health Survey. *Plos one*, 2023. 18(11): p. e0294464.
2. Seifu, B.L., *et al.*, Determinants of high-risk fertility behavior among women of reproductive age in Kenya: a multilevel analysis based on 2022 Kenyan demographic and health survey. *BMC Public Health*, 2023. 23(1): p. 2516.
3. Sinebo, Y., *et al.*, High-risk fertility behavior and associated factors among mothers attending antenatal care at public health facilities in Hossana Town, Central Ethiopia Region: facility based cross sectional study. *BMC Pregnancy and Childbirth*, 2025. 25(1): p. 31.
4. Rahman, M., *et al.*, Maternal high-risk fertility behavior and association with chronic undernutrition among children under age 5 y in India, Bangladesh, and Nepal: do poor children have a higher risk? *Nutrition*, 2018. 49: p. 32-40.
5. Mekonnen, Y., T. Ayalew, and A. Dejene, High-risk birth, fertility intention, and unmet need in Addis Ababa. *Ethiopian Journal of Health Development*, 1998. 12(2).
6. Kumar, S., N. Kumar, and S. Vivekadhish, Millennium development goals (MDGS) to sustainable development goals (SDGS): Addressing unfinished agenda and strengthening sustainable development and partnership. *Indian journal of community medicine*, 2016. 41(1): p. 1-4.
7. Tessema, Z.T. and K.S. Tamirat, Determinants of high-risk fertility behavior among reproductive-age women in Ethiopia using the recent Ethiopian Demographic Health Survey: a multilevel analysis. *Tropical Medicine and Health*, 2020. 48: p. 1-9.
8. Asghar, M., B. Murry, and K.N. Saraswathy, Fertility behaviour and effect of son preference among the Muslims of Manipur, India. *Journal of Anthropology*, 2014. 2014(1): p. 108236.
9. Rahman, M., *et al.*, Association between high-risk fertility behaviours and the likelihood of chronic undernutrition and anaemia among married Bangladeshi women of reproductive age. *Public health nutrition*, 2017. 20(2): p. 305-314.
10. Csa, I., *Central statistical agency (CSA)[Ethiopia] and ICF*. Ethiopia demographic and health survey, Addis Ababa, Ethiopia and Calverton, Maryland, USA, 2016. 1(1).
11. Seidu, A.-A., *et al.*, High-risk fertility behaviours among women in sub-Saharan Africa. *Journal of Public Health*, 2023. 45(1): p. 21-31.
12. Jonas, K., *et al.*, Teenage pregnancy rates and associations with other health risk behaviours: a three-wave cross-sectional study among South African school-going adolescents. *Reproductive health*, 2016. 13: p. 1-14.
13. Isabirye, A., The effects of high risk fertility behavior on child survival in Uganda. 2012, Makerere University.
14. Hasan, A., M. Singh, and A. Khan, Fertility behaviour and contraceptive use in urban slums of district Gorakhpur. *Int J Community Med Public Heal*, 2017. 4(12): p. 4702-5.
15. Brown, W., *et al.* Impact of family planning programs in reducing high-risk births due to younger and older maternal age, short birth intervals, and high parity. in Seminars in perinatology. 2015. *Elsevier*.
16. Moher, D., *et al.*, Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic reviews*, 2015. 4: p. 1-9.
17. Stang, A., Critical evaluation of the Newcastle-Ottawa scale for the assessment of the quality of nonrandomized studies in meta-analyses. *European journal of epidemiology*, 2010. 25: p. 603-605.
18. Nyaga, V.N., M. Arbyn, and M. Aerts, Metaprop: a Stata command to perform meta-analysis of binomial data. *Archives of public health*, 2014. 72: p. 1-10.
19. Howlader, M.H., *et al.*, Determinants associated with high-risk fertility behaviours among reproductive aged women in Bangladesh: a cross-sectional study. *Reproductive health*, 2022. 19(1): p. 17.
20. Rahman, M., A. Hosen, and M.A. Khan, Association between maternal high-risk fertility behavior and childhood morbidity in Bangladesh: a nationally representative cross-sectional survey. *The American journal of tropical medicine and hygiene*, 2019. 101(4): p. 929.
21. Singh, P. and K.K. Singh, Trends, patterns and predictors of high-risk fertility behaviour among Indian women: evidence from National Family Health Survey. *BMC Public Health*, 2024. 24(1): p. 626.
22. Tsala Dimbuene, Z., Z. Tadesse Tessema, and S.E. Wang Sonne, High-risk fertility behaviours among women of reproductive ages in the Democratic Republic of the Congo: prevalence, correlates, and spatial distribution. *PLoS One*, 2023. 18(3): p. e0283236.
23. Pal, S.K. and C. Shekhar, Examining the role of high-risk fertility behaviour in chronic undernutrition among Indian married women age 15-49. *Clinical Epidemiology and Global Health*, 2021. 11: p. 100739.
24. Asresie, M.B. and G.W. Dagnew, Association of maternal high-risk fertility behavior and under-five mortality in Ethiopia: Community-based survey. *Plos one*, 2022. 17(5): p. e0267802.
25. Aragaw, F.M., *et al.*, Spatial distribution and determinants of high-risk fertility behavior among reproductive-age women in Ethiopia. *Tropical Medicine and Health*, 2023. 51(1): p. 14.

26. Woldeamanuel, B.T., *et al.*, Women's education, contraception use, and high-risk fertility behavior: A cross-sectional analysis of the demographic and health survey in Ethiopia. *Frontiers in Global Women's Health*, 2023. 4: p. 1071461.

27. Gurmu, E. and D. Tariku, Correlates of high risk fertility behaviour in Ethiopia: a multilevel analysis of the 2011 Ethiopian demographic and health survey data. *J Heal Med Nurs*, 2017. 39: p. 86-95.

28. Kusheta, S., *et al.*, Maternal high-risk fertility behavior and its associated factors in Hadiya zone, southern Ethiopia: a facility-based cross-sectional study. *Ethiopian Journal of Health Sciences*, 2024. 34(2).

29. Daher-Nashif, S. and H. Bawadi, Women's health and well-being in the united nations sustainable development goals: A narrative review of achievements and gaps in the gulf states. *International journal of environmental research and public health*, 2020. 17(3): p. 1059.

30. Lawlor, D.A., L. Mortensen, and A.-M. Nybo Andersen, Mechanisms underlying the associations of maternal age with adverse perinatal outcomes: a sibling study of 264 695 Danish women and their firstborn offspring. *International journal of epidemiology*, 2011. 40(5): p. 1205-1214.

31. Filippi, V., *et al.*, Levels and causes of maternal mortality and morbidity. 2016.

32. Tessema, Z.T. and K.S. Tamirat, Determinants of high-risk fertility behavior among reproductive-age women in Ethiopia using the recent Ethiopian Demographic Health Survey: a multilevel analysis. *Tropical Medicine and Health*, 2020. 48(1): p. 93.

33. Mosiur Rahman, M.R., *et al.*, Maternal high-risk fertility behavior and association with chronic undernutrition among children under age 5 y in India, Bangladesh, and Nepal: do poor children have a higher risk? 2018.