

Contraceptive utilization and associated factors among reproductive-age women attending psychiatric outpatients' services in sub-Saharan Africa

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Abstract

Background

Family planning is essential for women of reproductive age and is particularly critical for women with mental illness, who are at increased risk of unintended pregnancy, sexual violence, and adverse maternal and neonatal outcomes. Despite this, contraceptive utilization among women with psychiatric disorders remains suboptimal, especially in low- and middle-income countries such as Ethiopia, where unmet need for family planning is high.

Methods

A systematic search of published studies was conducted using relevant electronic databases. Studies reporting contraceptive utilization and associated factors among women with psychiatric disorders were included. Data were extracted, and pooled estimates were calculated using appropriate meta-analytic techniques. Heterogeneity and publication bias were assessed using standard statistical methods.

Results

The finding of this meta-analysis showed that the pooled prevalence of contraceptive utilization among reproductive age women with psychiatric outpatients is 47.63% (95% CI: 30.31–64.95, $I^2 = 98.9\%$).

Intention to have children in the future (OR = 4.46, 95% CI: 0.65–8.26), Marital status (OR: 9.04, 95% CI: 2.93–21.00), educational status (OR: 5.01, 95% CI: 3.20–6.82), counseled by a physician (OR: 1.70, 95% CI: 0.95–2.46). Fear of drug side effects (OR = 1.79, 95% CI: 0.91–2.65) and knowledge (OR = 3.95, 95% CI: 1.05–6.84) were identified as factors associated with contraceptive utilization among reproductive-age women.

Conclusion

Family planning utilization among women with psychiatric outpatients remains inadequate despite their high reproductive health risks. Improving access to integrated mental health and reproductive health services, strengthening counseling, and enhancing awareness are essential to improve contraceptive uptake in this population. Policymakers and healthcare providers should prioritize tailored interventions that address both psychiatric and reproductive health needs.

Background

Family planning is important for all women of reproductive age. It is especially crucial for women with mental illness because they face a higher risk of unintended pregnancy, greater vulnerability to sexual

violence, and poorer pregnancy and childbirth outcomes related to their mental health condition.(1) Patients with major mental disorders, including schizophrenia-spectrum disorders, may have an enhanced risk when compared to groups of patients without psychiatric disorders for both unwanted pregnancies and children given up for others to raise.(2) In addition, women with mental illnesses also need special consideration when using hormone- based contraceptives due to possible interactions with psychotropic medication, although they can safely use other available methods(3).

In 2021, approximately 1.9 billion women of reproductive age (15–49 years) were living worldwide. Among them, 1.1 billion required family planning services, with 874 million using modern contraceptive methods, while 164 million still had an unmet need for contraception(4). Furthermore, mental disorders affected an estimated 970 million people globally in 2019, representing about one in every eight individuals, with anxiety and depressive disorders being the most common conditions. Contraceptive utilization remains relatively low in sub-Saharan Africa and other developing regions, with an estimated prevalence of 18.4%(5), while the unmet need for family planning services is considerably high at 55.3% (6–10). Ethiopia faces a similar challenge, characterized by low contraceptive use and a substantial unmet need for family planning services(9, 11).

According to the 2017 National Survey on Drug Use and Health, the prevalence of mental illness is higher among women (22.3%) than men (15.1%), and young adults 18–25 years of age have the highest prevalence. These statistics highlight the frequency of psychiatric disorders during the reproductive years in women (12).

In addition to the Ethiopian demographic health survey report, contraceptive coverage has increased from 6.3% in 2000 to 36% in 2019 among married women(13, 14) The prevalence of unplanned pregnancies is very high among psychiatric patients due to the frequent lack of insight, lack of planning, and difficulty in behavioral control (15, 16).

Negative consequences of untreated maternal depression might also affect the risk of prematurity of the baby, low birth weight, intra-uterine growth restriction, childhood development, and pregnant women with depression are more at risk of developing postpartum depression and suicidality (17).

Evidence indicates that women with psychiatric disorders are at increased risk of unintended pregnancy, sexual violence, poor obstetric outcomes, and reduced utilization of antenatal care services (18). These risks are further compounded by factors such as impaired judgment, stigma, limited access to healthcare, and potential interactions between psychotropic medications and Family Planning for Women with Severe Mental Illness in Rural Ethiopia: A Qualitative Study and oral contraceptives. Consequently, effective contraceptive utilization is especially critical for this group(19).

The primary risk factors for family planning utilization among reproductive-age women attending psychiatric outpatients include stigma, low economic status,, parity, side effects of methods, myths about family planning, cultural and religious oppositions, access for health care, level of contraceptive awareness, and opposition by spouses knowledge, attitude, having ever heard about Family planning, no

intention to have children, having no intention to use Family Planning in the future, marital status, Fear of drug interaction with psychiatric medication, having children, level of education, residence, counseled about modern family planning by a clinician or staff, and employment (20, 21).

Methods

Protocol Registration and Reporting

The protocol for this systematic review and meta-analysis has been registered with the International Prospective Register of Systematic Reviews and Meta-analyses (PROSPERO) under registration number CRD420261440672. The review has followed systematic review and meta-analysis guidelines, specifically the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (22). A completed PRISMA 2020 checklist documenting the systematic review process is provided.

Search strategy and information sources

"A comprehensive literature search was conducted to identify relevant articles using validated academic databases only, including PubMed, EMBASE, Scopus, and the Cochrane Library. The reference lists of included articles were also reviewed to identify additional studies. Gray literature and non-validated sources, such as Google Scholar and manual searching, were excluded to improve methodological rigor. The search was performed using the following key terms: "Contraceptive Agents" OR "Contraceptive Agents, Female" OR "Contraceptive Agents, Hormonal" OR "Contraceptive Devices" OR "Contraceptive Devices, Female." AND "reproduction" OR "Reproductive" AND "age" AND Africa.

Boolean operators (AND, OR) and truncation were applied as appropriate. The search was conducted up to 20th July 2026." The full electronic search strings for all validated databases are provided.

Eligibility Criteria

We used the Coco Pop (Condition, Context, and Population) approach for prevalence studies to declare inclusion and exclusion criteria

Inclusion criteria

- Only cross-sectional studies
- Studies conducted in Sub-Saharan African countries
- published between November 2013 and August 2025
- Contraceptive utilization among reproductive-age women attending psychiatric outpatients
- Articles published in peer-reviewed journals or grey literature
- Articles published in English.

Exclusion criteria

- Studies are not fully accessible
- Published before November 2013
- governmental and non-governmental reports, letters to the editor, opinion articles
- Research that did not involve women of reproductive age
- Poor quality as per the stated criteria
- Studies with no report of prevalence

Study selection

The article selection process was conducted using the updated 2020 PRISMA flow diagram to summarize the approach. First, all retrieved articles from the search strategies were imported into EndNote X20 to remove duplicate articles. After eliminating the duplicated articles from the EndNote Library, the titles and abstracts of the remaining articles were assessed independently by three authors. When disagreements happened between the two reviewers on article inclusion and exclusion, it was resolved through discussion by other participating authors.

Data extraction

After screening the eligible studies, four authors extracted the relevant data. Any discrepancies between the authors were addressed through discussion and consultation with other invited reviewers. For each included study, the following information was collected and recorded in a Microsoft Excel spreadsheet: authors' names, publication year, study region, study setting, study design, sample size, definitions of contraceptive utilization, prevalence of contraceptive utilization, and contributing factors.

Measurement of outcome variables

Contraceptive method: includes male and female condoms, injectable (Depo Medroxy Progesterone Acetate) (DMPA), oral contraceptive pills, diaphragm, implants, intrauterine contraceptive devices (IUCD), female tubal ligation, and male partner sterilization (23). **Contraceptive utilization** was defined as: If a woman with psychiatric illness was using any one of the following modern family planning methods, such as pills, intrauterine device, injectable, condom (men or women), sterilization, implants(24, 25)

Data processing and analysis

The Contraceptive utilization among reproductive-age women attending psychiatric outpatients was analyzed using STATA version 17. A random-effect model was applied to estimate the utilization of Contraceptive Agents, Hormonal Contraceptive Agents, and Contraceptive Devices. The results were reported through graphical representation using a forest plot with a 95% confidence interval (CI), and Cochran's Q test and I² were used to identify heterogeneity among the included articles. Furthermore,

evidence of publication bias was assessed using funnel plot asymmetry and weighted Egger's regression test with a p-value of less than 0.05 as a cutoff point. Each primary study was described concisely using a summary table.

Subgroup analyses were performed based on sampling technique and country to account for potential differences in contraceptive utilization and study design. Country stratification was justified by known regional variations in the prevalence of contraceptive utilization, health infrastructure, and cultural practices influencing maternal knowledge. Sampling technique stratification was included because methodological differences may affect representativeness and prevalence estimates. Stratified random-effects meta-analysis was used to estimate pooled effect sizes within subgroups, and meta-regression was conducted to formally test interaction effects across subgroups. Statistical significance of subgroup differences was assessed using p-values for interaction terms, and heterogeneity within subgroups was quantified using the I^2 statistic.

Meta-regression analyses were conducted to explore the influence of continuous study-level covariates on effect size variability. This approach provides a more complete understanding of the sources of heterogeneity and strengthens the robustness and interpretability of the meta-analytic findings.

Potential associated factors of contraceptive utilization were prespecified based on prior empirical evidence and theoretical rationale. Educational status was classified as no formal education, primary, secondary, or tertiary education; marital status as Married/unmarried; Knowledge as poor or good. These categories were determined before analysis. Pooled odds ratios were estimated using random-effects meta-analysis.

Heterogeneity test and publication bias

We used Cochran's Q and the I^2 statistics to determine heterogeneity between studies (26), which estimates the percentage of total variation across the studies. We explored sources of heterogeneity through subgroup analysis by region. Sensitivity analysis was also performed for the effect of each study on the overall estimate. The visual funnel plot test and Egger's statistical test were used to check the presence or absence of publication bias (27).

Result

Study selection and identification

A total of 2,041 studies were retrieved from various electronic databases using different search strategies. The studies were identified from PubMed (203), Scopus (53), ScienceDirect (48), EMBASE (2), Cochrane Library (1,725), and Google Scholar (10).

Figure 1, Summary of the literature search for the prevalence of contraceptive utilization in sub-Saharan Africa, Systematic review and meta-analysis PRISMA flow diagram.

Contraceptive utilization among reproductive-age women in Sub-Saharan Africa

The utilization of contraceptives among the studies included in this study ranged from 27% in Nigeria (28) to 87.7% in Uganda (29). Due to the high heterogeneity ($I^2 = 98.9\%$, $P = 0.00$) observed in this analysis, a random-effects model was used to estimate the pooled prevalence. Therefore, the pooled estimated reproductive age women with psychiatric outpatients in Africa on contraceptive utilization was 47.63% (95% CI: 30.31–64.95, $I^2 = 98.9\%$) in Africa.

Figure 2: shows the pooled estimate of reproductive-age women about contraceptive utilization in Africa:

Sub-group analysis

Sub-group analysis was done based on the sampling technique. The pooled prevalence of contraceptive utilization among reproductive age women in studies conducted using systematic random sampling techniques was 52.30% (95% CI: 26.75, 77.85; $I^2 = 99.4\%$, $P < 0.000$, which was higher than studies conducted using purposive sampling, 39.67% (95% CI: 15.27, 64.07; $I^2 = 95.4\%$, $P < 0.000$).

Figure 3. Subgroup analysis of the prevalence of contraceptive utilization based on sampling techniques in Africa

Subgroup analysis was conducted by country. The pooled prevalence of contraceptive utilization among reproductive women in studies conducted in Uganda was 87.70% (95% CI: 84.38, 91.02), which was higher than studies conducted in the country of Nigeria, 27.00% (95% CI: 18.30, 35.70).

Figure 4. Subgroup analysis of the prevalence of contraceptive utilization based on the country in Africa

Sensitivity

In sensitivity analysis using the leave-one-out approach, excluding any of the studies had a significant effect on the pooled estimates. Therefore, sensitivity analysis using the random-effect model revealed that no single study influenced the overall pooled prevalence.

Figure. 5. Results of the sensitivity analysis of all included studies.

Results of original studies

At the end, a total of 8 studies with a sample size of 2501 and a response rate of 98.7% were analyzed. Regarding study designs, seven of 8 studies are cross-sectional, one is a Qualitative study, and regarding quality assessment, all studies have high quality assessed by the Ottawa scale.

Table 1: Methodological quality assessment for included studies using the Newcastle Ottawa scale (NOS)

Characteristics of included studies

This included 8 studies from different countries in Africa. The sample size for each study ranges from 100 to 810. The prevalence of contraceptive utilization among reproductive-age women in each study varied from 27% (28) to 87.7%(29). All studies were cross-sectional studies, where four studies were from Ethiopia (20, 21, 24, 30) Four studies were from Africa (28, 29, 31, 32). All studies have been assessed as high quality by the Ottawa scale (33).

Table 2: Summary characteristics of studies on contraceptive utilization in Sub-Saharan Africa

Publication Bias

The presence of publication bias was assessed graphically and statistically. Egger’s test. There is symmetry of the graph, and Egger’s test did not indicate statistically significant small-study effects ($P = 0.253$), suggesting that publication bias is unlikely to substantially affect the pooled estimate.

Figure 6, Publication Bias Prevalence of contraceptive utilization among reproductive age women in Africa: a systematic review and meta-analysis

Factors associated with contraceptive utilization among reproductive-age women in Sub-Saharan Africa

In this meta-analysis, utilization of contraceptives among reproductive-age women with psychiatric outpatients in the African setting was associated with intention to have children in the future, marital status, educational status, being counseled by a physician, fear of drug side effects, and knowledge.

A pooled analysis of three studies found that women of reproductive age who did not intend to have children in the future were approximately 4.46 times more likely to use contraceptives than those who had future childbearing intentions ($OR = 4.46, 95\%CI:0.65-8.26$).

Figure 7. Forest plot showing the pooled odds ratio of the association between the intention to have children in the future and contraceptive utilization.

In this meta-analysis, the combined results from two studies showed that married women of reproductive age were significantly more likely to use contraceptives than unmarried women. The pooled odds ratio was 9.04 (95% CI: 2.93–21.00), indicating that married women had approximately nine times higher odds of contraceptive utilization. Consequently.

Figure. 8. Forest plot showing the pooled odds ratio of the association between marital status and contraceptive utilization.

In the present meta-analysis, the pooled odds ratio from four included studies demonstrated that reproductive-age women with higher educational attainment were approximately 5.01 times more likely

to utilize contraceptives than women with lower levels of education (OR: 5.01, 95% CI: 3.20–6.82). Thus, a fixed effect model analysis was used.

Figure 9. Forest plot showing the pooled odds ratio of the association between educational status and contraceptive utilization.

In the present meta-analysis, the pooled odds ratio estimates from four included studies indicated that reproductive-age women who received counseling from a physician were approximately 1.70 times more likely to use contraceptives compared with those who did not receive physician counseling. (OR: 1.70, 95% CI 0.95–2.46). Thus, a fixed effect model analysis was used.

Figure 10. Forest plot showing the pooled odds ratio of the association between counseling and contraceptive utilization.

In addition, the pooled odds ratio estimates from two included studies revealed that reproductive-age women who were not concerned about potential drug side effects were approximately 1.79 times more likely to use contraceptives than their counterparts (OR = 1.79, 95% CI: 0.91–2.65). Given the absence of substantial heterogeneity between the studies.

Figure 11. Forest plot showing the pooled odds ratio of the association between fear of drug side effects and contraceptive utilization.

The pooled odds ratio from the two studies included in the meta-analysis showed that women with good knowledge were approximately 3.95 times more likely to use contraceptive methods compared with those with poor knowledge (OR = 3.95, 95% CI: 1.05–6.84). Consequently, a fixed-effect model was employed to estimate the overall effect size.

Figure 12. Forest plot showing the pooled odds ratio of the association between knowledge and contraceptive utilization.

Discussion

This meta-analysis estimated that the pooled prevalence of contraceptive utilization among reproductive-age women with psychiatric outpatient follow-up in sub-Saharan Africa was 47.63% (95% CI: 30.31–64.95). The substantial heterogeneity observed in this meta-analysis ($I^2=98.9\%$) is likely due to several factors, including differences in the level of contraceptive awareness, knowledge, having ever heard about Family planning, no intention to have children, having no intention to use Family Planning in the future, marital status, and socioeconomic conditions across countries. The large disparity in country-level contraceptive utilization, with Uganda reporting 87.7% and Nigeria 27%, underscores these contextual differences. Accordingly, the overall pooled estimate of 47.63% should be interpreted cautiously, acknowledging that it represents an aggregate across highly heterogeneous populations. Interventions aiming to improve contraceptive utilization should therefore be tailored to specific country

contexts, taking into account local healthcare infrastructure, health education initiatives, and population characteristics.

This review aimed to assess the combined contraceptive utilization and associated risk factors of reproductive-age women attending psychiatric outpatients across Africa. The meta-analysis revealed a pooled contraceptive utilization of reproductive age women at 47.63% (95% CI: 30.31 – 64.95, $I^2 = 98.9\%$). This rate is somewhat higher than that reported in a previous study conducted in Finland, which found a prevalence of 25.8% (34) and Pennsylvania (20%) (35). On the other hand, the observed prevalence is lower than that reported in studies from South India (68.4%) (36). The variations found in the results could stem from differences in the study populations and the methods used to measure outcomes. For instance, the research from Finland relied entirely on national registries, pulling data from the Care Register of Health Care, the Medical Birth Register, the Population Register Centre, the Prescription Centre, and the Register of Induced Abortions, and The findings from the Pennsylvania study may be attributed to its specific sampling method, which used a convenience sample restricted to women diagnosed with major depressive disorder (MDD), bipolar disorder, or schizophrenia/schizoaffective disorder. In contrast, the current study took a much broader approach by including women with any type of psychiatric disorder. Furthermore, in the study conducted in southern India, the participants were examined for contraception among women with schizophrenia with having at least one living child, and were currently staying with their husband, in contrast to the current study, which encompassed all women of reproductive age.

A recent systematic review of randomized controlled trials and cohort studies from a range of countries (mostly the Americas and Eurasia) found evidence for a protective effect of hormonal contraceptives on anxiety and, for those with a history of mental illness, on depression(37). These cross-cultural differences may reflect the complex bidirectional relationship between contraceptive use and mental health. This relationship is likely to differ between specific populations owing to factors such as cultural perceptions regarding contraception and fertility (e.g., fears that contraception may lead to infertility), social support (from immediate family or the wider community), and general sexual and reproductive health that may be influenced by factors relating to the social determinants of health.

This systematic review and meta-analysis found that contraceptive utilization among reproductive-age women with psychiatric outpatients in sub-Saharan Africa was significantly influenced by factors such as intention to have children in the future, educational status, marital status, being counseled by a physician, fear of drug side effects, and knowledge. The analysis grouped education levels into categories: no formal education, primary, secondary, and tertiary, to explore their association with utilization of contraceptives. It was revealed that women with a tertiary education were more likely to use contraceptives as compared to those without any formal education, and this association was statistically significant. This finding was in line with similar studies conducted in Iraq (38) and Zimbabwe(11). This might be since better-educated women would be more likely to have access to information on contraceptive methods, better knowledge of contraceptives, and be more likely to use the services. Educational refinement of highly educated women may influence their service utilization and

decision-making power on reproductive health issues, including family planning. Additionally, educated women might be able to obtain information from different sources, like books, leaflets, and magazines, and might have a better chance of exposure to family planning education through mass media than their counterparts (39).

This systematic review and meta-analysis found that women who had no intention to have children in the future were more likely to use FP than women who had the intention of having children in the future. which is consistent with earlier findings in studies conducted in India (10) and consistent with EDHS 2016 (40). Nevertheless, many continued to use reversible contraceptive methods, which may not have been fully aligned with their intention to limit future pregnancies. This finding suggests a potential gap between reproductive preferences and contraceptive method choice among women with mental illness. The observed discrepancy may reflect inadequate family planning counseling, limited access to appropriate contraceptive options, or challenges related to mental health conditions and healthcare utilization. These findings highlight the need for tailored, client-centered family planning education and counseling within mental health and reproductive health services, ensuring that contraceptive choices are consistent with women's reproductive intentions rather than relying solely on general awareness-raising interventions.

The findings of the present review suggest that women with psychiatric illnesses who received counseling from psychiatrists or other healthcare providers were more likely to utilize modern family planning methods than those who did not receive such counseling. This association underscores the important role of healthcare professionals in promoting informed reproductive health decisions among women with mental illness. Consistent with these findings, evidence from a study conducted in Pennsylvania (35), demonstrated that counseling received from health facility staff within the previous year was significantly associated with increased utilization of modern contraceptive methods. The observed relationship may be explained by the ability of counseling services to improve knowledge, address misconceptions, and enhance access to appropriate family planning options, thereby facilitating contraceptive uptake among this vulnerable population.

On the other hand, the present review found that women of reproductive age with mental illness who had good knowledge of family planning were significantly more likely to utilize contraceptive methods compared with those who had poor knowledge. which is consistent with earlier findings in studies conducted in Pennsylvania (35). This can be justified by the fact that women who have good knowledge about healthy timing and spacing of pregnancy can better use FP when compared with their counterparts, that is, the women who know family planning methods are more likely to use the method consistently and effectively than their counterparts. In addition, this might be because Knowledgeable women with psychiatric illness have a better understanding of a high risk of unplanned pregnancy, vulnerability to sexual violence, and poor obstetric outcome, which encourages them to use family planning.

Finally, the review findings suggest that women whose psychiatric medications were compatible with contraceptive methods were more likely to utilize modern family planning than their counterparts. This association may be attributed to concerns regarding potential drug interactions between hormonal contraceptives and certain psychotropic medications, which can influence both contraceptive effectiveness and treatment outcomes. Consequently, women with mental illness often require individualized contraceptive counseling and careful method selection. In addition, limited access to accurate information and inadequate understanding of compatible family planning options may further hinder contraceptive uptake in this population. These findings highlight the importance of integrating family planning services into mental health care and ensuring that healthcare providers offer comprehensive counseling on safe and appropriate contraceptive choices for women receiving psychotropic treatment.

Strengths and limitations

This study represents the first systematic review and meta-analysis to quantitatively examine factors associated with the utilization of contraceptives in sub-Saharan African countries. A thorough search was carried out across various electronic databases, reference lists of relevant articles, and through manual searching. Quality assessment was performed, and the screening process was independently conducted by two reviewers. However, the study has several limitations. All the included studies were cross-sectional in design, which restricts the ability to infer causality. Additionally, the meta-analysis considered all forms of utilization of contraceptives, and only studies published in English were included, potentially excluding relevant research published in other languages. There was significant heterogeneity among the included studies, possibly due to differences in assessment tools or definitions used. Furthermore, there were insufficient studies on some associated factors to draw strong conclusions, and not all African countries were represented. As such, more comprehensive and inclusive research is needed across the region.

Conclusions and recommendations

Intervention strategies to improve contraceptive utilization should be context-specific, taking into account the substantial heterogeneity observed across countries and study settings. This systematic review and meta-analysis found that the utilization of contraceptive methods among women with psychiatric outpatients remains suboptimal, with several factors significantly influencing contraceptive use, including family planning knowledge, receipt of counseling from healthcare providers, fertility intentions, and the compatibility of contraceptive methods with psychotropic medications. Overall, women who had adequate knowledge, received counseling, and used medications compatible with contraceptive methods were more likely to utilize contraceptives, highlighting the importance of integrating reproductive health services within mental healthcare. Based on these findings, it is recommended that family planning services be fully integrated into mental health care settings, with strengthened and individualized counseling provided by healthcare professionals to address both reproductive intentions and mental health needs. In addition, targeted educational interventions should

be implemented to improve awareness and knowledge of contraceptive options among women with mental illness, while healthcare providers should carefully consider potential interactions between psychotropic drugs and contraceptive methods when advising clients. Policymakers should prioritize the development of integrated service delivery strategies to improve access to family planning for this vulnerable population, and further research is needed to explore barriers and evaluate the effectiveness of integrated interventions.

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Figures

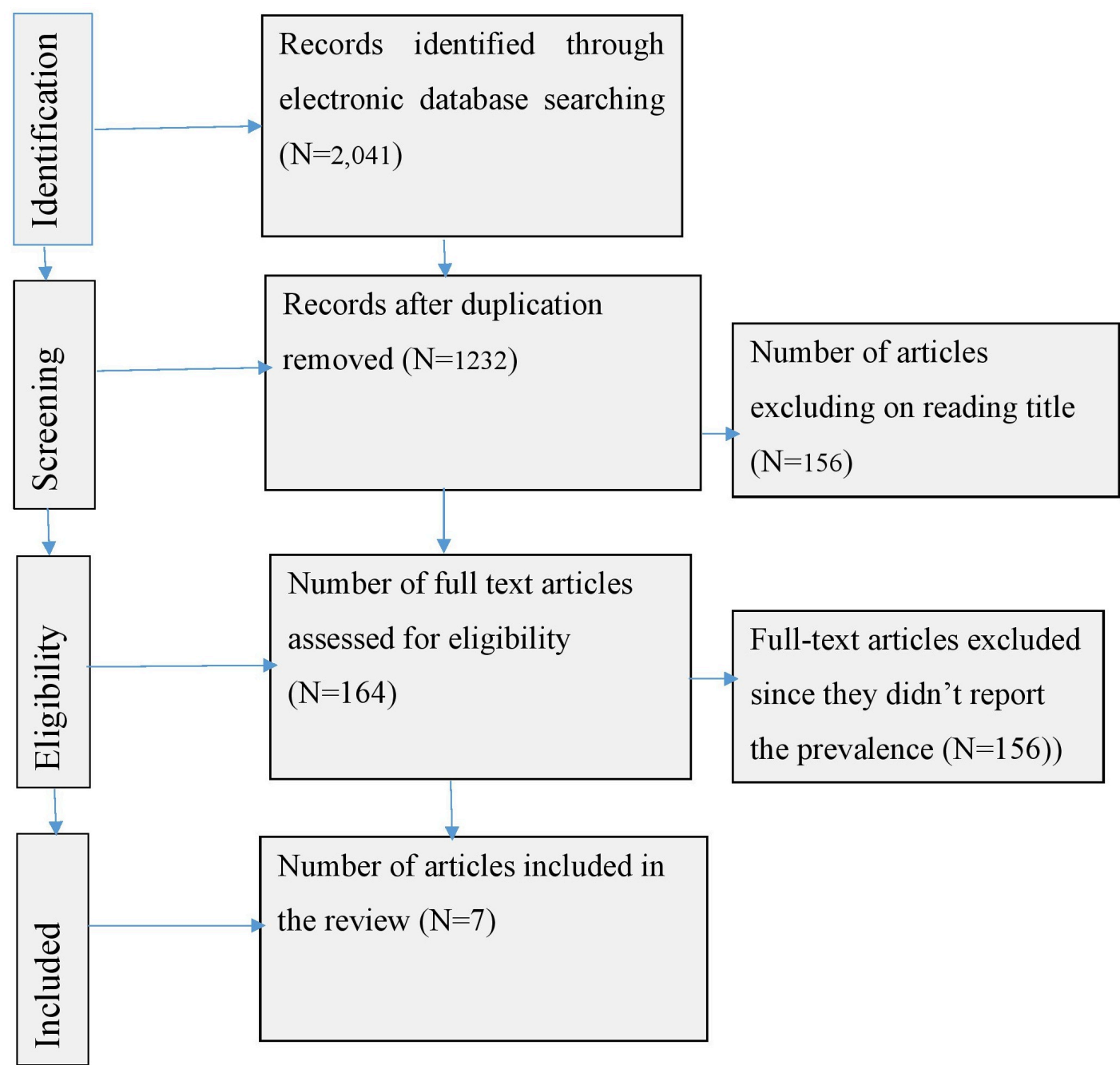


Figure 1

Summary of the literature search for the prevalence of contraceptive utilization in sub-Saharan Africa, Systematic review and meta-analysis PRISMA flow diagram.

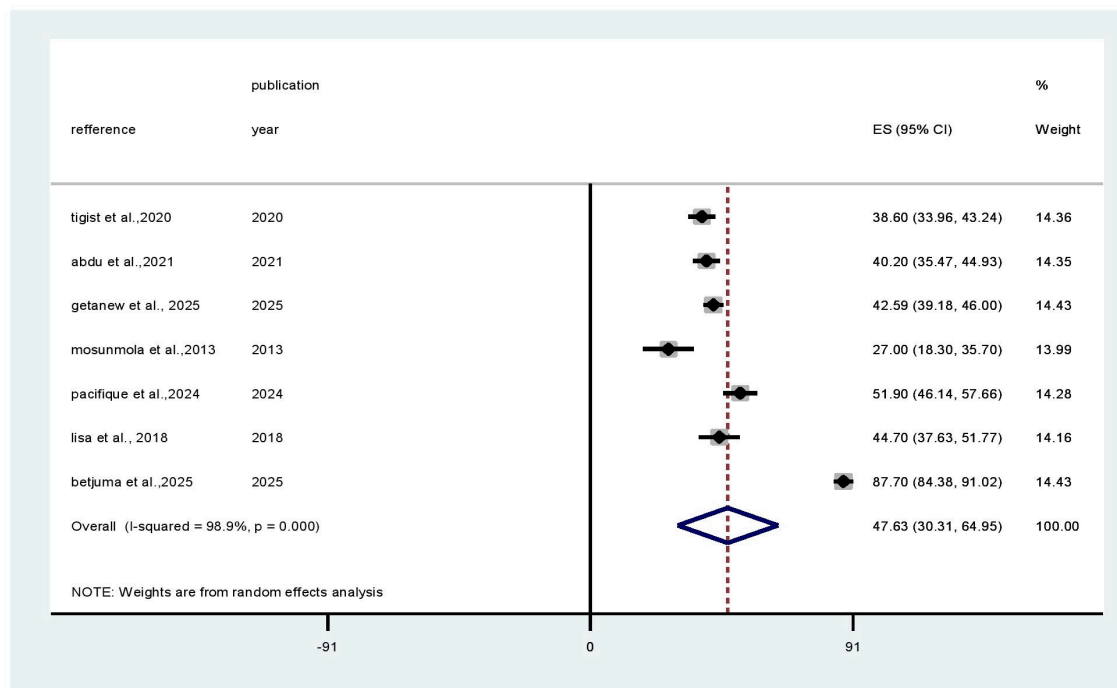


Figure 2: shows the pooled estimate of reproductive-age women about contraceptive utilization in Africa:

Figure 2

See image above for figure legend

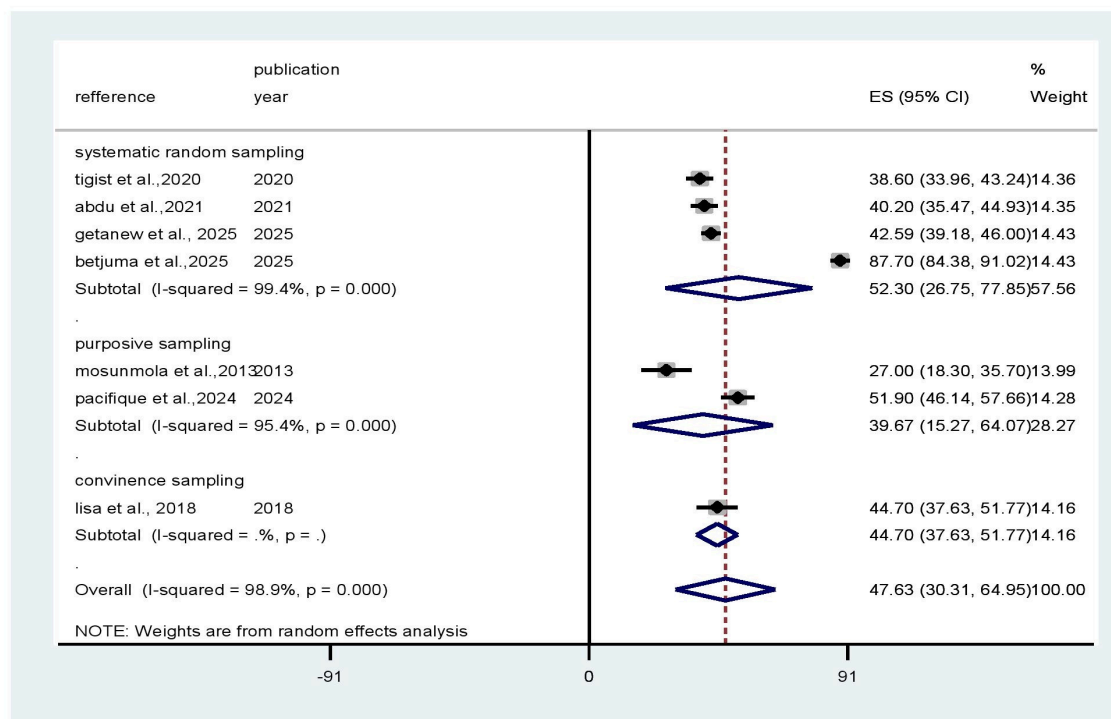


Figure 3. Subgroup analysis of the prevalence of contraceptive utilization based on sampling techniques in Africa

Figure 3

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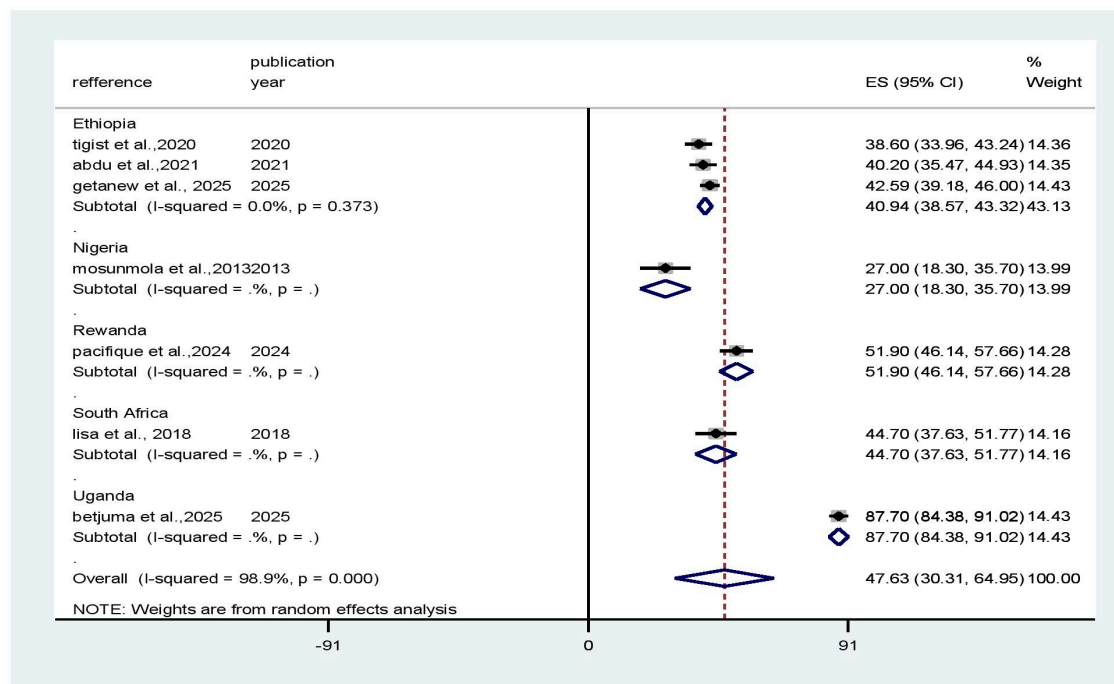


Figure 4. Subgroup analysis of the prevalence of contraceptive utilization based on the country in Africa

Figure 4

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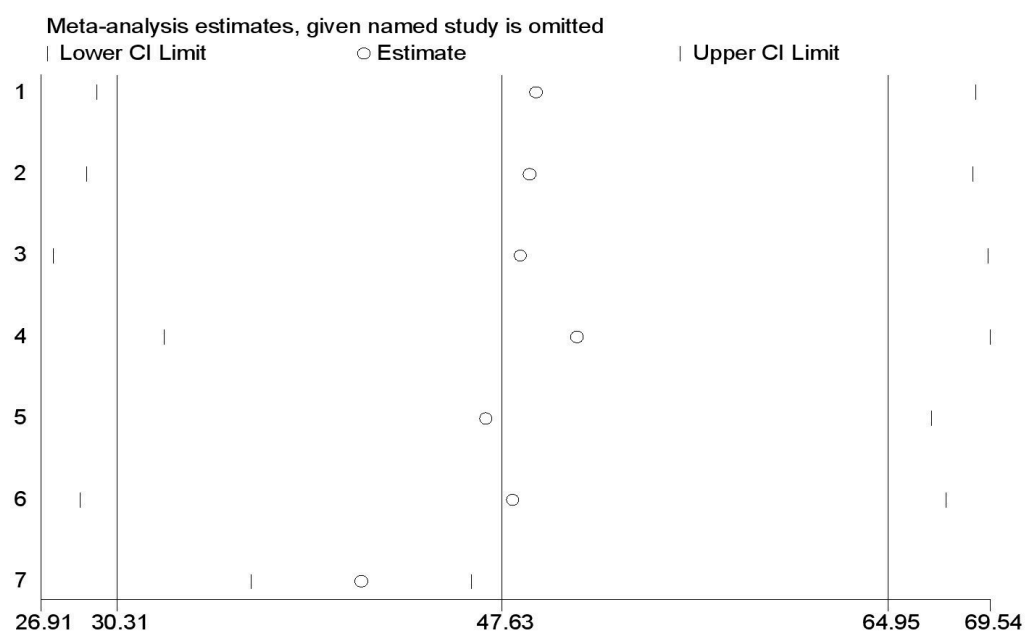


Fig. 5. Results of the sensitivity analysis of all included studies.

Figure 5

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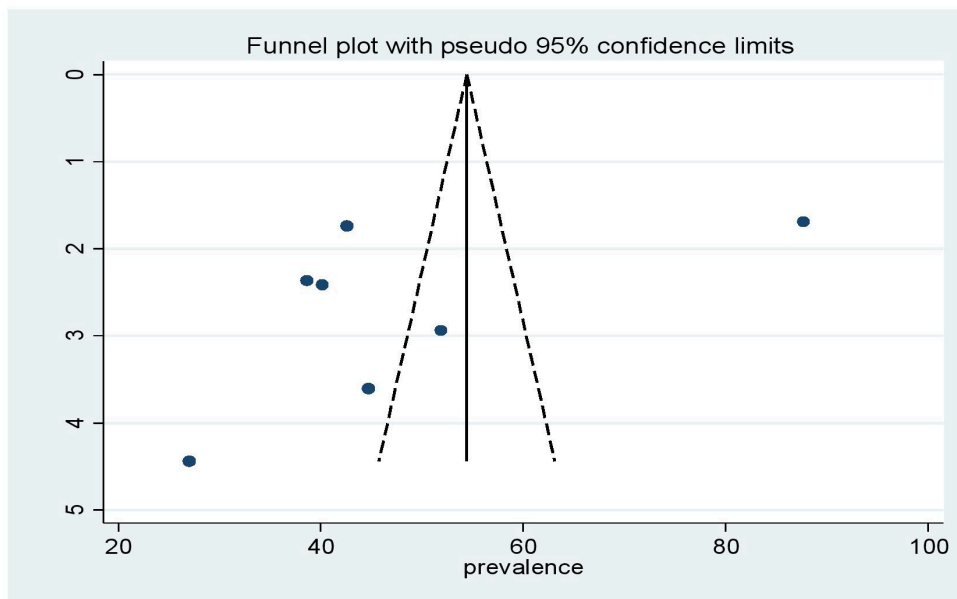


Figure 6, Publication Bias Prevalence of contraceptive utilization among reproductive age women in Africa: a systematic review and meta-analysis

Figure 6

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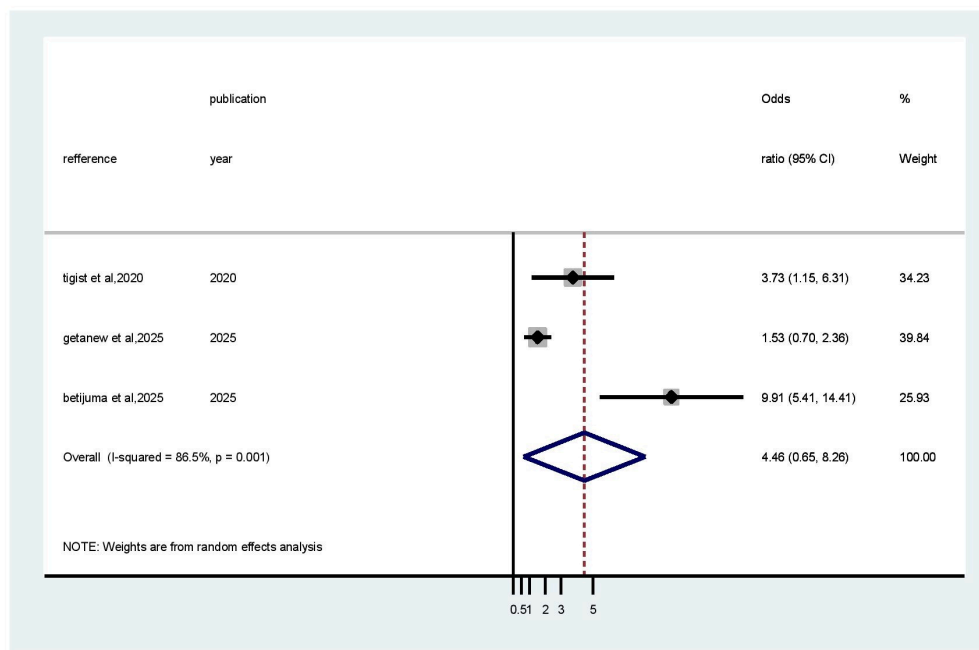


Fig. 7. Forest plot showing the pooled odds ratio of the association between the intention to have children in the future and contraceptive utilization.

Figure 7

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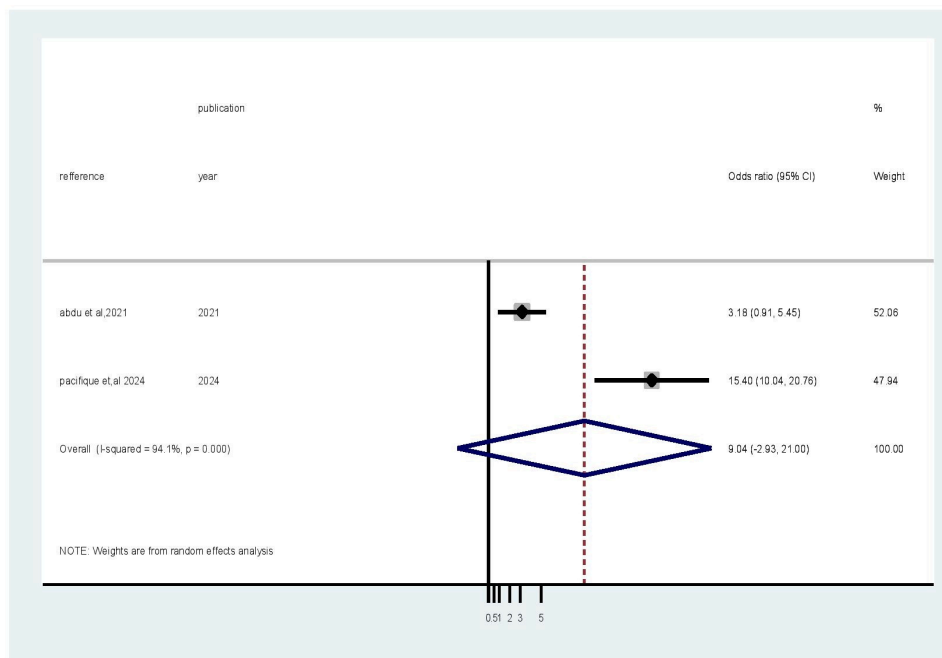


Fig. 8. Forest plot showing the pooled odds ratio of the association between marital status and contraceptive utilization

Figure 8

See image above for figure legend

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Figure 9

Forest plot showing the pooled odds ratio of the association between educational status and contraceptive utilization.

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Figure 10

Forest plot showing the pooled odds ratio of the association between counseling and contraceptive utilization.

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Figure 11

Forest plot showing the pooled odds ratio of the association between fear of drug side effects and contraceptive utilization.

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Figure 12

Forest plot showing the pooled odds ratio of the association between knowledge and contraceptive utilization.