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HIV PREVENTION METHOD IMPLEMENTATION: A LITERATURE REVIEW

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ABSTRACT

HIV/AIDS is a global health issue with 79.3 million infections and 36.3 million deaths. It increases maternal morbidity and mortality, leading to adverse pregnancy outcomes. The WHO's PMTCT (Prevent Mother-To-Child Transmission) program *aims to reduce transmission rates. This literature review evaluates PMTCT implementation by analyzing factors, assessing program effectiveness, and examining companions' roles in supporting pregnant women. Using the PRISMA method, the review identifies articles from Pubmed, Science Direct, Scopus, BMC Journal, and Oxford Academic. Factors influencing implementation include education, economic status, facility location, referral systems, and social stigma. Male involvement, stigma, and lack of support hinder compliance with pregnancy checks and ARV therapy. Midwives' and men's knowledge on PMTCT influences the attitudes and behaviors of HIV-positive mothers. This literature review concludes that the effectiveness of measures to prevent mother-to-child HIV transmission is significantly high when implemented correctly. The effectiveness of PMTCT services is influenced by various factors, necessitating the involvement of multiple stakeholders.*

Keywords: HIV/AIDS, PMTCT, Preventive Measures

ABSTRAK

HIV/AIDS merupakan masalah kesehatan global dengan 79,3 juta infeksi dan 36,3 juta kematian, yang meningkatkan morbiditas dan mortalitas ibu serta berdampak negatif pada kehamilan. Program PMTCT (Pencegahan Penularan dari Ibu ke Anak) WHO bertujuan untuk mengurangi angka penularan HIV/AIDS. Tinjauan literatur ini mengevaluasi pelaksanaan PMTCT dengan menganalisis faktor-faktor yang mempengaruhi, menilai efektivitas program, dan mengkaji peran pendamping dalam mendukung ibu hamil. Menggunakan metode PRISMA, tinjauan ini mengidentifikasi artikel dari Pubmed, Science Direct, Scopus, BMC Journal, dan Oxford Academic. Faktor-faktor yang mempengaruhi pelaksanaan meliputi pendidikan, status ekonomi, lokasi fasilitas, sistem rujukan, dan stigma sosial. Keterlibatan laki-laki, stigma, dan kurangnya dukungan menghambat kepatuhan terhadap pemeriksaan kehamilan dan terapi ARV. Pengetahuan bidan dan laki-laki tentang PMTCT mempengaruhi sikap dan perilaku ibu dengan HIV. Tinjauan literatur ini menyimpulkan bahwa efektivitas langkah-langkah untuk mencegah penularan HIV dari ibu ke anak akan sangat tinggi jika diterapkan dengan benar. Efektivitas layanan PMTCT dipengaruhi oleh berbagai faktor sehingga memerlukan keterlibatan banyak pemangku kepentingan dalam pelaksanaannya.

Kata Kunci: HIV/AIDS, PMTCT, Tindakan Preventif

INTRODUCTION

According to the United Nations Programme on HIV and AIDS (UNAIDS) in 2022, the global number of people living with HIV is 38.4 million. with 1.3 million new infections and 630,000 AIDS-related deaths. Currently, 29.8 million individuals receive antiretroviral treatment. Since the epidemic's onset, 85.6 million have contracted HIV, resulting in 40.1 million deaths. Projections suggest 33.1 million and 45.7 million HIV cases by 2022. Indonesia saw an upward trend in HIV cases, peaking at 50,282 in 2019. The Asia Pacific region accounted for 78% of new HIV cases in 2019. In 2013, Indonesia had 12,214 people living with HIV (UNAIDS, 2023; Kemenkes RI, 2020).

Transmission of HIV and AIDS can take place both vertically and horizontally. Vertical spread, also known as transmission from mother to child, is one of the transmissions responsible for the most significant number of instances. If we cannot stop this transmission, it will increase the mortality rate for both mothers and children. If the mother does not receive prompt treatment for her HIV infection during pregnancy, there is a possibility that the virus can be transmitted to her baby during childbirth or when the mother breastfeeds the child (Psaros et al., 2020). Without any intervention, the likelihood of HIV being passed from a mother to her child ranges between 20 to 50 percent. However, by providing effective interventions to prevent the transmission of HIV from mother to child, it is achievable to reduce the transmission rate to less than 2 percent. The estimated chances of a woman passing on HIV to her child are around 5-10% during pregnancy, 10-20% during the process of giving birth, and an average of 15% while breastfeeding (Kemenkes RI, 2019).

The global strategy led by WHO aims to Prevent Mother-To-Child Transmission (PMTCT) of HIV through the PMTCT (Prevention of Mother to Child HIV Transmission) program, advocating for antiretroviral medications (ARVs) for mothers and babies during pregnancy, childbirth, and lifelong treatment (Psaros et al., 2020). In Indonesia, the program to prevent HIV transmission from mothers to children is called the PPIA program, which stands for "Prevention of Mother-to-Child HIV Transmission." It is part of the National Program for Control of HIV/AIDS, STIs, and Hepatitis B. Various stakeholders, including NGOs, non-profits, and local communities, are involved. Pregnant women are screened for HIV, Syphilis, and Hepatitis B at Maternal and Child Health services, starting from the first ANC examination until delivery. The PPIA program was initiated in various regions of Indonesia in 2005. Its goal is to ensure that all pregnant women receive antenatal care and information on safe motherhood, safe sexual practices, STI prevention, prenatal testing, counseling, and follow-up services. The program aims to systematically prevent HIV/AIDS transmission from mothers to children and provide treatment options (Kemenkes RI, 2019). This

literature review aims to evaluate the implementation of PMTCT by analyzing contributing factors, assessing program effectiveness, and examining the role of companions in supporting pregnant women within the PMTCT program.

METHOD

1. Data Sources and Search Strategy

The literature review was conducted between July 7 and 12, 2023. The PRISMA method (Preferred Reporting Items for Systematic Review and Meta-Analysis methodology), which focuses on PMTCT success factors in connection to the risk of HIV transmission from mother to child, was then used to collect the publications. On the basis of the literature review, searches were conducted in five databases: Pubmed, Science Direct, Scopus, BMC Journal, and Oxford Academic. Process of searching using the search terms "PMTCT" or "PMTCT for HIV" or "Prevention of Mother-to-Child Transmission" or "Prevention HIV" or "Program PMTCT" documented with Mendeley.

2. Eligibility Criteria

A distinct evaluation group reviewed the titles and abstracts of the research to identify studies that met the criteria. Within the research team, the authors identified studies that satisfied the eligibility criteria and retrieved the full texts of those systematic reviews. Differences in perspectives were resolved through discussions among the authors and other reviewers.

The literature search procedure was continued using the research limitations, and then titles were selected from each database using the PICO framework. The PICO framework helps in defining and refining research questions by identifying key elements such as the patient or population of interest, the intervention being studied, any relevant comparisons, and the desired outcomes. P (Population) dalam penelitian ini yaitu wanita yang menerima PMTCT (Prevention of Mother-to-Child Transmission) Program. I (Intervention) yaitu PMTCT program, C (Comparison) yakni kelompok yang tidak mendapatkan PMTCT, dan O (Outcomes) merujuk pada peningkatan pengetahuan dan keterlibatan dalam mengikuti program pencegahan transmisi ibu ke anak. Artikel yang digunakan merupakan artikel dengan metode penelitian randomized controlled trial, cross sectional, dan penelitian retrospektif.

3. Data Extraction

Data from the articles included in the study were collected using a standardized extraction template. This information covered details such as the main author, year of publication, source, study population, location, study design, objectives, and outcomes. The systematic review process followed PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) guidelines, ensuring transparency in the methodology and contributing to the development of this paper.

Before analysis, the search results from the five databases contained 74,103 articles. 14 journals were obtained for further research based on the criteria for journals that will be used to conduct literature reviews, namely original articles published in the last five years, namely from 2018 to 2023 in English and containing PMTCT programs in HIV for both mothers and infants.

RESULTS

To examine the PMTCT program, which emphasizes on preventing HIV transmission to mothers and children, ten studies were chosen.

1. Search Summary

A literature search across five databases yielded 74,103 articles with the specified keywords. After filtering by publication year, 18,195 articles remained. Excluding 450 duplicates, 17,745 articles were retained. Further screening based on abstract and title reduced this number to 2,390. An additional exclusion of 2,381 articles based on outcome criteria and related interventions resulted in a final selection of 9 articles.

2. Narrative Review Result

Based on a literature review of nine articles, this study aims to evaluate the effectiveness of PMTCT programs, identify implementation factors, and emphasize the involvement of husbands and healthcare workers in these programs. Two articles address the effectiveness of PMTCT, six articles examine factors influencing PMTCT implementation, and two articles discuss the roles of husbands and midwives in supporting PMTCT in women.
The characteristics of the articles are summarized in Table 1. Among them, two are randomized controlled trials, one uses mixed methods, one employs a non-prospective comparative study, and the remaining five use cross-sectional research methods.

The article on PMTCT effectiveness indicates that counseling activities do not significantly impact the transmission of sexually transmitted infections and HIV to pregnant women. However, the use of booklets in counseling positively impacts the knowledge of pregnant women with HIV regarding PMTCT. Factors influencing PMTCT implementation include education and knowledge levels about PMTCT, economic status, facility location, referral systems, long waiting times, ANC frequency, gravida, busyness, social stigma, and PMTCT program involvement.

Regarding husband/male involvement and the role of midwives in PMTCT programs, male involvement can include financial support, awareness of ANC schedules, and regular condom use. Barriers to male involvement include scheduling conflicts, long waiting times, and the belief that pregnancy check-ups are solely a woman's responsibility. Factors influencing the role of midwives include their level of knowledge and the accessibility of information related to PMTCT implementation.

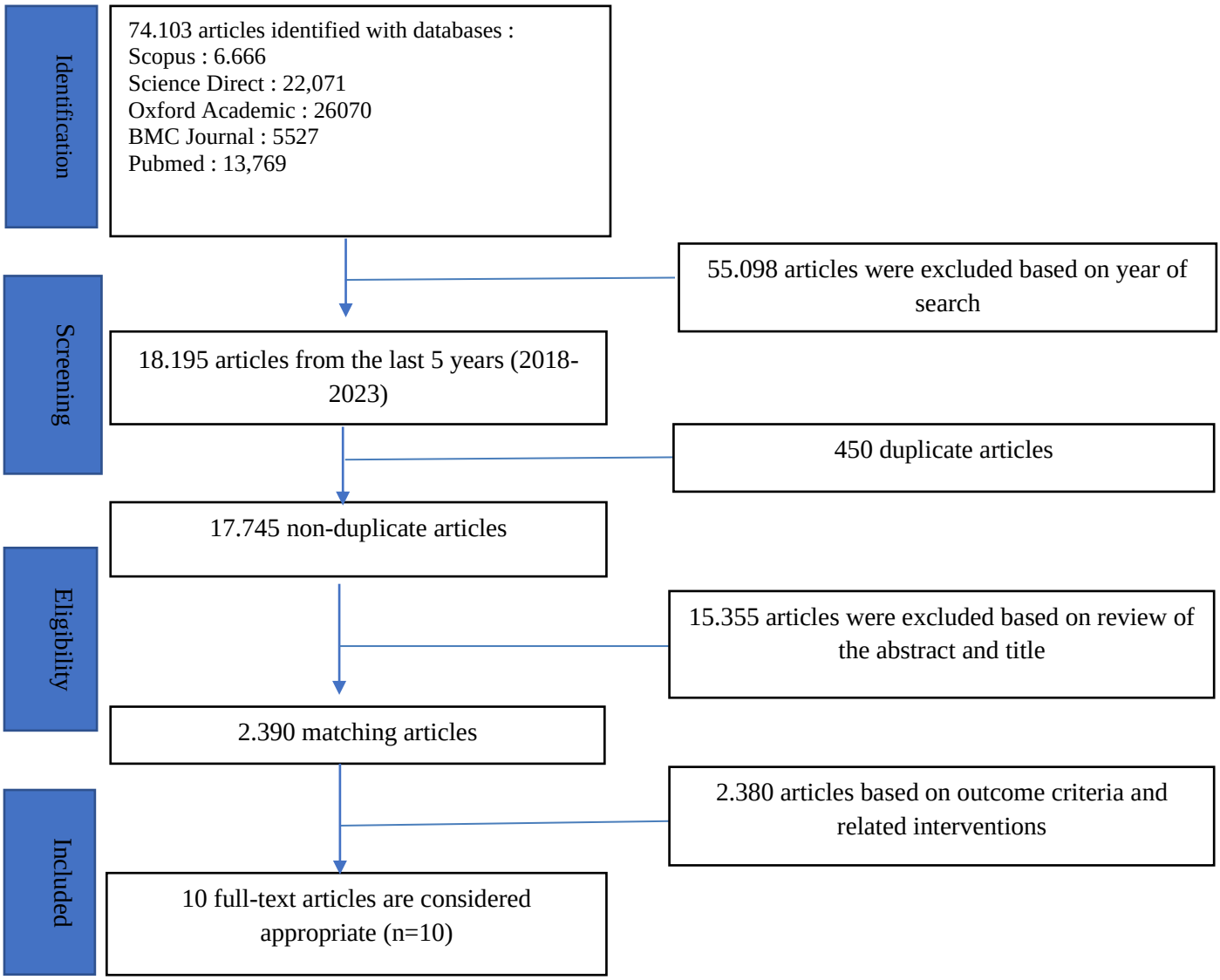

Figure 1. Systematic Flow of Literature Searching

Table 1
The List of Characteristic Studies

Main Author	Year	Source	Sample	Study Population	Location	Study Design	Objectives	Outcomes
(Homsy et al., 2019)	2019	PLOS One	820 pregnant women HIV-negative pregnant individuals who attended antenatal appointments alone (n = 410) or in pairs (n = 410 partners)	HIV-uninfected pregnant women aged 15-49	Uganda	Unblinded parallel randomized control trial	To determine the efficacy of increased HIV counseling interventions in preventing HIV transmission in HIV-uninfected women during pregnancy and lactation.	No notable discrepancy was observed in HIV prevention counseling between the intervention and control groups. There were no significant variances in STI prevalence or incidence at the study's commencement between the intervention and control groups (all p values > 0.05).
(Worku et al., 2022)	2022	BMC	A systematic random sampling procedure was used to choose the 538 research participants from among the pregnant women who underwent follow-up ANC at the Amharadata State Referral Hospital.	Pregnant women attending ANC services in Amhara Regional State reffereal hospital	Ethiopia	Cross-sectional	Identifying HIV risk factors among expectant women attending the ANC clinic at Amhara State Referral Hospital, Ethiopia	Higher education levels, relatively higher monthly income, a history of abortion, and previous syphilis status were factors linked to HIV status. Strengthening formal education, empowering women in all areas of life, educating about HIV transmission, advocating for using family planning, and regular screening for syphilis can reduce women’s vulnerability.

(Lima et al., 2022a)	2022	PubMed	The study began with 104 HIV-positive pregnant women and ended with 45 women.	Pregnant women living with HIV	Brazil	A randomized controlled clinical trial pilot study	To assess the efficacy of providing booklets in boosting pregnant women's knowledge of PMTCT.	There were no significant differences in the average knowledge scores of the women between the groups (short-term p = 0.473; long-term p = 0.151). The booklet had a positive impact on the knowledge of pregnant women in the intervention group, both in the short-term (p = 0.002) and long-term (p = 0.033).
(Feleke & Wasie, 2018)	2018	PubMed	2615 pregnant women responded.	Pregnant women who did ANC visit in 7 health centers chosen by random sampling technique.	Amhara Region, Ethiopia	Cross-sectional comparative study	Estimating the prevalence and antecedents of PMTCT services in ANC services in contexts with limited resources	Only 61.3% [95% CI: 59%-63%] of pregnant women attending ANC at health facilities utilized PMTCT services. Factors influencing PMTCT service utilization included knowledge of PMTCT, place of residence, internal referral system, client interaction with health professionals, fear, long waiting time, ANC visit rate, gravidity, educational status, and engagement in PMTCT services.
(Ngangue et al., 2021a)	2021	PubMed	102 pregnant women with HIV who participated in the ANC and PMTCT Program	Pregnant women living HIV followed by ANC	Haiti	A Mixed-Methods Study	Examine the extent of male participation in PMTCT (prevention of mother-to-child transmission), taking note of any hindrances or factors affecting their involvement.	47% of couples are highly involved, with 90% providing financial support and 82% aware of ANC appointments. However, only 25% of men attend ANC visits, and 19% consistently use condoms. Male involvement in PMTCT services is moderate due to scheduling conflicts, long wait times, and the belief that antenatal care is for women. Gender relations, cultural beliefs, and care organization also hinder their participation.
(Meilani et al., 2019a)	2019	Science Direct	A total of 80 midwives were chosen at random as respondents.	All midwives working in primary helath in Mother and Children Clinics.	Indonesia	Cross-sectional	Gaining knowledge about the factors that influence the role of midwives in the execution of PMTCT (Prevention of Mother-to-Child Transmission).	In terms of implementing PMTCT, 47.5% of midwives scored poorly. The study discovered that the presence of information through outreach efforts (p-value = 0.047) and the level of knowledge (p-value = 0.016) was linked to the implementation of Prevention of Mother-to-Child Transmission (PMTCT) methods.
(Philemon et al.,	2021	PubMed	These children were	Mothers from 37 clinics chosen who had	Kilimanjaro,	Cross-sectional	to ascertain the mother's knowledge of	Counseling on ART (OR=2.17, 95% CI 1.08–4.36) and breastfeeding during ANC

2021a)			registered at 38 PMTCT clinics in the Kilimanjaro region. 521 HIV-positive mothers with young children under the age of two provided information.	children aged below two yeats and currently enrolled in PMTCT	Tanzania	design	PMTCT and the elements connected to her knowledge of PMTCT	visits (OR=2.38, 95% CI 1.38–4.11) were the only factors significantly linked to higher odds of good PMTCT knowledge.
(Fedlu et al., 2020a)	2020	PubMed	190 participants in PMTCT follow-up at selected public health centers who were pregnant or breastfeeding moms.	All pregnant women and lactating mothers receiving PMTCT follow-up care at the selected public health facilities in Harar town.	Ethiopia	Cross-sectional	to assess the level of adherence and the association between mothers who are pregnant or breastfeeding and PMTCT in Harar town, Ethiopia's community health center	83.2% of participants adhered well to PMTCT. The main reasons for non-adherence were forgetfulness (79%) and being busy (71%). Those who received counseling on side effects were 3.4 times more likely to adhere. Participants with known HIV status were 2.1 times more likely to adhere, and knowledgeable women were 5.2 times more likely to adhere.
(Breton, Hawa Diallo, et al., 2022)	2022	PubMed	All expectant women infected with HIV between February 2017 and March 2018 who are at least 18 years old, admitted to the hospital to give birth, and are at high risk of MTCT HIV are included in this study.	All HIV-infected pregnant women without initiated ART or receiving ART <4 weeks before delivery	Guinea	non-prospective comparative study	Assess the viability of a strategy combining twice-daily treatment post-birth with intensified antiretroviral prophylaxis for high-risk infants within 48 hours of delivery. Also, investigate the implementation process of HIV testing protocols during childbirth.	A retrospective study showed 52% of women had a pVL<400 copies/mL at delivery, linked to undisclosed HIV status and/or antiretroviral intake. Undisclosed HIV status was tied to higher self-stigmatization (85% vs. 44%, P=0.02). High-risk infants were more frequently lost to follow-up (44% vs. 8%, P<0.01) than low-risk infants, associated with maternal stigmatization (69% vs. 31%, P<0.01).

(Psaros et al., 2020)	2020	PubMed	200 pregnant women (mean age 28 years) engaged in PMTCT completed their third-trimester interview.	All women were screened for eligibility by a racially and ethnically concordant female research assistant fluent in English and isiZulu, and provided written consent in Distric Hospital.	Natal, South Africa	Cross-sectional	To enhance the comprehension of the various factors that impact PMTCT adherence and to guide the creation of interventions.	73% of respondents are unemployed, with the majority living with HIV. While 40% expressed preferences for the timing of their current pregnancy, the majority were unsure. Median compliance was 91.17%, with 24% exhibiting high depressive symptoms. Stigma levels were low (median: 2 [1, 3]), while social support was moderate (median = 3.6 [3.2, 4.0]). Taxis were the most common mode of transportation (67%), with 41% traveling for 25 minutes, 59% for 30-40 minutes, and 8% for 40-50 minutes. Additionally, 68% of respondents reported incomes below the poverty level.

DISCUSSION

Over three decades, HIV/AIDS has caused 79.3 million infections and 36.3 million deaths globally (Worku et al., 2022). By 2020, 37.7 million people lived with HIV/AIDS, with 1.5 million new infections. During pregnancy, HIV/AIDS increases risks of maternal morbidity, mortality, and adverse outcomes like abortion and low birth weight. Mother-to-child transmission (MTCT) risk is 15-45%, higher in undeveloped countries (Clark et al., 2020). Research indicates that factors such as education level, abortion history, syphilis diagnosis, and lower family income are linked to a higher risk of HIV infection in pregnant women (Worku et al., 2022). Additionally, women with a history of sexually transmitted infections, divorced or unmarried, or drug addicts are more likely to contract syphilis and HIV (Zhong et al., 2022). Marital status, environment, age, and education also play a role in the risk of infection. Married or living with partners reduce HIV infection risk, while environment, age, and education also impact HIV infection in pregnant women (de Dieu Anoubissi et al., 2019).

The Political Declaration on HIV and AIDS committed to eliminating AIDS by 2030, including reducing new HIV infections in children by 95% by 2020. The World Health Organization uses PMTCT, a mother-to-child transmission prevention program, to achieve this goal (Homsy et al., 2019; UNODC, 2021). The General Assembly of the Political Declaration on HIV and AIDS committed in 2016 to eliminate AIDS as a hazard to public health by the year 2030. This includes initiatives to eliminate new HIV infections in children, which will be accomplished by reducing the frequency of new infections by 95% across all regions by the year 2020. One of the global techniques that the World Health Organization employs is a mother-to-child transmission prevention program, often known as PMTCT (Prevention of Mother-to-Child Transmission).

The Prevention of Mother-to-Child Transmission (PMTCT) is a comprehensive HIV prevention strategy adopted by the World Health Organization (WHO) that eliminates restrictions on HIV prophylaxis for pregnant and lactating mothers (Breton, Diallo, et al., 2022; Fedlu et al., 2020). It is recommended that newborns receive enhanced antiretroviral prophylaxis and BID at birth. Research has shown that counseling and knowledge about pregnancy and ARV use are crucial for successful PMTCT implementation (Mennecier et al., 2021; World Health Organization, 2016). However, in countries with limited resources and male partners, HIV counseling and testing are best done in pairs (Fedlu et al., 2020b; Philemon et al., 2021). Providing HIV identification strategies and safe sexual habits can improve the implementation of HIV prevention and treatment (Homsy et al., 2019). The distribution of pamphlets can also help establish cooperative relationships between health practitioners and expectant HIV-positive women. The PMTCT model can be developed to enhance existing services and improve efficiency in limited resource settings. However, challenges such as stigma, distance, costs, and regulations hinder the implementation of PMTCT. Familiarity with PMTCT practices can also impact acceptance and acceptability (Carolina et al., 2017; Lima et al., 2022).

According to Breton et al (2022) research findings, The likelihood of losing follow-up after giving birth to mother-infant pairs at a high risk of MTCT increases when there is a high prevalence of HIV stigma. As a result, the development of interventions to fight stigma is urgently required to maintain and improve the PMTCT program (Breton, Diallo, et al., 2022). Mustapha et al.,(2018) regarding the implementation of PMTCT among adolescents and young mothers show the results of knowing one's HIV status and caring for the unborn baby’s health. The primary motivators for adolescents and young mothers to use PMTCT services are counseling and support from peers and health professionals. Contrarily, the most demotivating reasons are stigma, financial difficulties, secrecy, and a lack of partner and family support (Mustapha et al., 2018).

Midwives are professional health workers who play a significant part in the process of putting into action PMTCT. They are tasked with the responsibility of administering this program. The knowledge about HIV that midwives possess can serve as a fundamental basis for influencing the behaviors and perspectives of patients about HIV(Fatima Mohammed et al., 2016; Ogbonna et al., 2016). However, research shows a lack of awareness about PMTCT implementation among midwives (Danso & Habedi, 2023). This lack of knowledge is influenced by the lack of socialization and the absence of PMTCT implementation itself (Meilani et al., 2019). Additionally, the lack of involving husbands or male partners in counseling leads to less effective implementation. The World Health Organization considers men's involvement in HIV testing and prenatal counseling as important factors (World Health Organization (WHO), 2019). To be considered involved, partners must attend prenatal check-ups, discuss prenatal interventions, contribute to monitoring, and use condoms. Factors such as marriage and HIV status are associated with male participation, but gender issues, sociocultural beliefs, and social concerns hinder participation (Amano & Musa, 2016; Ngangue et al., 2021).

LIMITATION OF THE STUDY

This literature review highlighted limitations encountered during the search process, particularly noting a scarcity of relevant literature across multiple databases.

CONCLUSIONS AND SUGGESTIONS

The effectiveness of the PMTCT (Prevention of Mother-To-Child Transmission) program is influenced by factors such as maternal education and the utilization of educational tools. Low implementation rates are associated with discrimination, insufficient knowledge, low income, delays in accessing services, and adverse obstetric histories. The support of midwives and the involvement of husbands are critical for the successful implementation of PMTCT. However, barriers to success include inadequate education, gender issues, sociocultural factors, and limited social awareness among husbands.

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Conflict of Interest Statement

The authors declare that there are no competing interests.

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