

Effectivity of Methods of Patient Navigation on Increasing Adherence to Postpartum Medical Visits

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The objective of this study is to identify the most effective method of patient navigation that appears to have the greatest impact on patient attendance to postpartum medical visits to decrease detection time for the diagnosis of postpartum complications and reduce maternal mortality rates. This research involved a comprehensive systematic literature review using the PubMed database in order to identify the most productive patient intervention. This review took into account various factors including socioeconomic status, societal stigma, particularly based off of geographic location, and postpartum mental health conditions that hinder patient attendance to postpartum follow-up appointments. Articles in foreign languages or those which focused on patient interventions solely for prenatal care or medication adherence were excluded from this study. No studies were excluded based on their (statistical) methodology. This study provides an analysis of existing patient interventions and determines a comprehensive patient intervention as the most efficient existing method to encourage higher attendance rates at postpartum doctor's appointment. This paper further identifies community outreach interventions to increase the attainability of postpartum care. With the implementation of this comprehensive patient intervention comes the potential to decrease detection time for postpartum complications and reduce maternal mortality rates.

Introduction

Postpartum visits are critical to diagnose postpartum complications and reduce maternal fatalities, and thereby adherence to these appointments is critical to most effectively provide healthcare for postpartum mothers. Postpartum complications often occur after mothers and their newborns are released from the hospital. In more developed countries, women are more likely to take their newborns to their scheduled check-ups; however, the increased stress in daily life after delivery often deters mothers from attending their postpartum check-ups. Further, in less developed countries, the average number of children per family is greater in order to help provide for the family, and the lack of resources and stress to sustain a larger family often hinder the attendance of mothers at their post-delivery check-ups. Additionally, various societal stigmas also deter women from utilizing postpartum healthcare services.

As such, postpartum fatalities are frequent with maternal morbidity rates generally stagnant¹. Leading causes of such fatalities may be related to physical

complications in the days following childbirth including cardiovascular diseases, medical conditions as a manifestation of pre-existing illnesses, infection, sepsis, post-delivery hemorrhage, cardiomyopathy, thrombotic and amniotic fluid pulmonary embolism, stroke, hypertension, and anesthesia-related complications². Many fatalities are also the result of postpartum psychiatric illness including postpartum depression and psy-

chosis³. Current studies focus on the general need for improved patient navigation systems or the analysis of the effectiveness of a single intervention to increase patient adherence to postpartum healthcare; however, they do not address which existing method is the most effective and has the greatest impact on patient attendance. Further, there are no existing systematic reviews on this topic. The unique aim of this study is that this paper contains a detailed analysis and comparison of the efficacy of existing interventions which has not been done in previous studies.

Current research mainly focuses on the general implementation of patient navigation as effective in reducing high rates of maternal morbidity, but lacks specified methods of patient navigation that are most effective in increasing healthcare utilization and thus decreasing maternal morbidity in the postpartum period. This study aims to conduct a systematic literature review that analyzes, on a global scale, the effectiveness of various methods of patient navigation and identifies a comprehensive care initiative as the most successful in improving the attendance of mothers to their postpartum medical visits, followed by a detailed description of the article screening process and a data extraction table. Moreover, in the paper we want to identify the most effective intervention that might be related to a direct increase in patient adherence to post-delivery follow-up appointments.

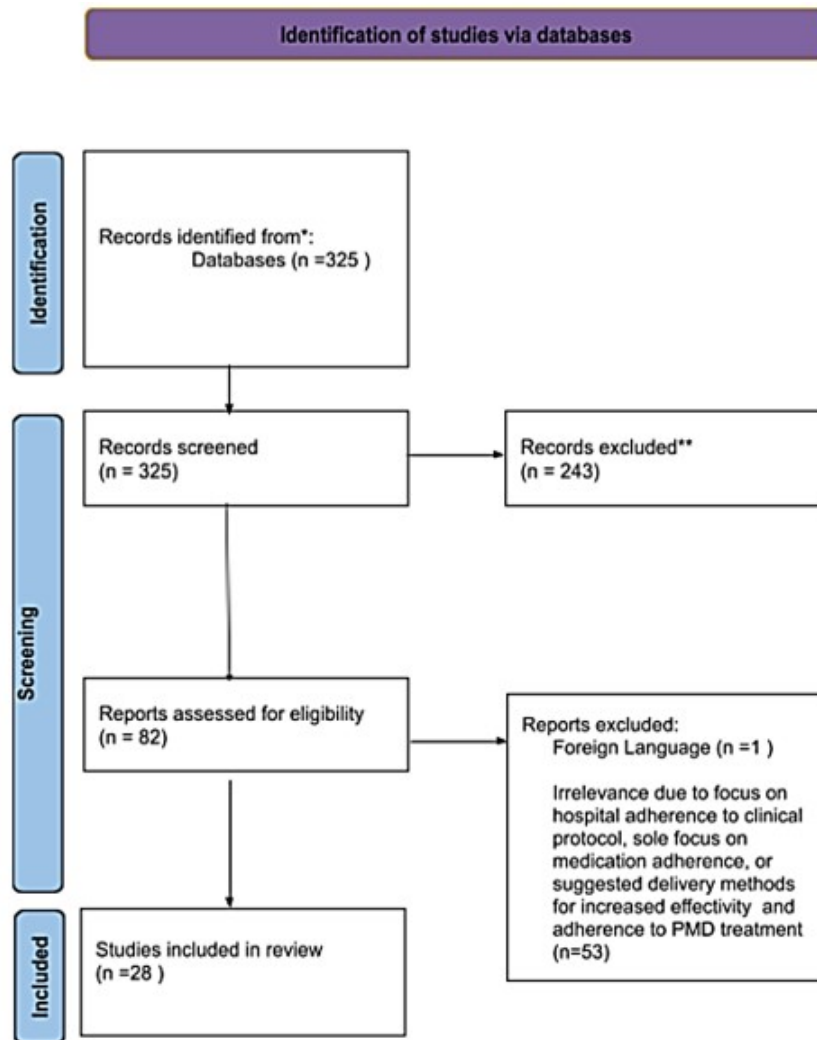


Fig. 1 PRISMA Flow Chart of Screening Process

Results

Results of Search, Screening, and Extraction

The screening process, as shown in the Figure 1 above, exhibits the process through which the included studies were determined. After inputting the search terminology detailed in Figure 5 (pg.12), PubMed generated 325 records after which the title and abstract of each was screened, and 243 of these studies were excluded as they did not meet, or have the potential to meet, the aforementioned inclusion criteria. Subsequently, the remaining 82 articles were thoroughly and completely reviewed, after which 54 were excluded due to failure to contribute information valuable to this systematic review. While one of these articles was excluded as it was written in a foreign language, the other 53 articles were deemed irrelevant as they focused on the compliance of hospital staff to established postpartum treatment protocols, patient adherence to a medication protocol, or PMD treatment methods, whose secondary outcomes did not include any potential correlation to increased adherence to postpartum medical visits as a result of the intervention.

After these studies were eliminated, 28 were included in the review. Of these 28 articles, 7 of which were randomized control trials, 16 focused on specific patient interventions whose primary or secondary outcomes were to increase postpartum medical visit attendance, 5 focused on factors impacting adherence to postpartum medical protocol, and 7 detailed community outreach methods to provide accessible postpartum medical care within certain communities. Utilizing the methodology, the PRISMA chart was outlined based on the previously described screening process as seen in Figure 1 above. Figure 6 below (pg.13) further exhibits the data extraction of all included articles.

Measurements for Patient Adherence

Amongst the articles that were included in the systematic review, adherence to postpartum medical visits was directly measured through the use of several metrics including attendance at postpartum visits (in accordance with regional guidelines), postpartum dental visits, infant well child care visit attendance, maternal postpartum care compliance, emergency healthcare utilization, and postpartum hypertension visit adherence. Relevant secondary outcomes of these studies included nonroutine clinic visits, self-reported depressive symptoms, attendance and follow-up with referrals to other physicians including psychiatrists, psychologists, cardiologists, retention with Hepatitis B treatment, and visit completion with a primary care provider if the patient is high-risk for cardiovascular complications. Adherence to various medications such as birth control, supplements, antiretroviral therapy (ART), misoprostol, or other prescribed medications was also measured. Other notable outcomes included misoprostol availability, adoption of safe infant sleep

practices, breastfeeding, the number of sustained community connections, maternal mental health parenting behavior, postpartum blood pressure values, screening with Edinburgh Postnatal Depression Scale (EPDS), maternal mortality and morbidity, facility delivery, number of women receiving home visits by public health nurses, and long term mother and child outcomes.

Factors Influencing Rates of Patient Adherence to Postpartum Medical Visits

As seen in Table 1 above, patient non-adherence to postpartum follow-up care can be attributed to several factors. In particular, postpartum depressive symptoms (PDS), with a report of 13.8% in the state of Texas experiencing PDS, appeared to correlate with a lack of attendance at postpartum check-ups and dental visits, where women without symptoms of postpartum depression were 70% more likely to adhere to standard follow-up protocol⁴. Furthermore, a lack of postpartum Medicaid insurance coverage appears to correlate with decreased attendance to postpartum follow-up appointments. Overall, mothers with postpartum Medicaid eligibility were ~ 1.2% more likely to attend their check-ups as compared to those only eligible for Medicaid coverage for the duration of the pregnancy; however, this also varies within certain racial demographics as extended Medicaid eligibility correlated with an even greater likelihood of Hispanic communities and decreased rates of Black postpartum patients to adhere to postpartum follow-up care⁵. Furthermore, particularly in Kenya and Tanzania, amongst other African countries in which HIV is extremely prevalent, the impacts of depression, societal stigma surrounding the virus, and IPV appear to correlate with greatly decreased adherence to postpartum follow-up and ART treatment where only 63% of women would follow their treatment protocol⁶. Additionally, cultural beliefs in China often led to high rates of declined referrals to psychiatrists and psychologists after a comprehensive screening using EPDS, with an identified preference for a familial support system as opposed to a clinical treatment approach⁷. Moreover, the normalization of depressive symptoms, limited public knowledge, fear, and discomfort regarding postpartum depression appear to dissuade care-seeking behaviors.

Methods of Patient Intervention

Within reviewed articles, there were several identified methods of patient intervention to increase patient adherence to postpartum follow-up appointments and referrals. These interventions included a childbirth education program and postpartum Medicaid eligibility expansion^{5,8}. Additionally, a hospital-wide quality-improvement initiative involving education programs for parents and healthcare professionals, a designated nurse educator, and comprehensive protocols for treatment of postpartum hypertensive disorders for inpatient, outpatient, and readmission

Table 1 Stigma and Mental Health and Likelihood to Attend Postpartum Medical Visits

Factor	Likelihood of Attending Postpartum Medical Visits (%)
Without PDS Compared to Patients With PDS	70
Without Postpartum Medicaid Compared To With	1.0-1.4
Odds of Adherence to ART and Clinic Visits (n=200) due to HIV-stigma, IPV, and PDS	63
Chinese Women's Acceptance and Uptake of Referral after Screening for Perinatal Depression	0.4

Percentage Impact of Various Factors on Likelihood of Attendance at Postpartum Medical Visits; PDS=postpartum depressive symptoms, ART=Antiretroviral Therapy, HIV=Human Immunodeficiency Virus, IPV=Intimate Partner Violence.

care was put forward⁹. The Queen-Emma Clinic in Honolulu also proposed a postpartum follow-up initiative which involved providing women with both the time and date of their follow-up appointment before being released from the hospital after delivery, and a picture taken of the mother and baby at the first postpartum follow up which was then printed and placed in a photo album from the hospital and given to the mother during the second follow-up appointment¹⁰. A study analyzing the impact of an initial appointment two weeks postpartum as opposed to the traditional initial appointment at six weeks postpartum was also put forth¹¹. The “Navigating New Motherhood” program including a hired navigator to provide logistical support for mothers after delivery was also tested to increase attendance to postpartum medical visits¹². Furthermore, delivery and payment redesign to reduce healthcare disparities in treatment of high-risk postpartum cases to increase adherence to postpartum visits were also advanced¹³.

An extensive intervention involving schedule logs, telehealth check-in appointments between the first and third weeks after delivery, screening with the EPDS, and a team engagement plan was also proposed to increase attendance at postpartum medical visits¹⁴. Other proposed interventions included screening for postpartum depression at well-child appointments, midwifery-led care with a protocol to address mental health and physiological complications, and a postpartum visit to mothers by their newborn's future primary care provider in the nursery in addition to telephone access to contact their physicians as needed¹⁵⁻¹⁷.

In Tanzania, where HIV is extremely prevalent, tailored supportive interventions for new mothers to reduce HIV stigma and increase healthcare utilization was proposed. Specifically, a program to instate a peer mother mentor or improve social support systems from their partners as

a part of the treatment plan to improve retention in HIV care after delivery has been studied^{18,19}.

Furthermore, as ease of navigation of the healthcare system is particularly difficult for immigrants in the United States, a culturally appropriate telephone patient intervention has the potential to increase attendance to Hepatitis-B follow-up care after delivery²⁰. Similarly, electronic health records have the potential to improve attendance at cardiovascular follow-up appointments subsequent to hypertensive disorder diagnosis in the postpartum period²¹.

Community Outreach to Provide Accessible Postpartum Care

While many patient interventions consisted of clinical protocols and programs, less developed countries also struggle with adherence to postpartum medication due to lack of access to such resources. As such there have also been several initiatives including a community-based distribution of misoprostol in Nigeria to reduce the frequency of postpartum hemorrhage, and community-organized nurse home-visitation program amongst other community based initiatives for healthcare professionals to monitor mothers and their infants for potential complications and provide a new potential setting for postnatal depression screening^{22,23}. While home-visiting in particular has become a widespread method to provide postpartum care, the Precision Family Spirit Program, as opposed to standard visitation, was also proposed to improve patient satisfaction, the client-nurse relationship, and improve overall retention and satisfaction of mothers with this community outreach program²⁴.

Table 2 Patient Intervention and Adherence to Postpartum Medical Visits

Intervention	Control (%)	Intervention (%)	Change (%)
Comprehensive postpartum visit initiative in an urban hospital practice	27	57	+30
Evidenced-Based Approach to Addressing Maternal Depression in Pediatric Settings	56	85	+29
Systematic Treatment and Management of Postpartum Hypertension	33.5	59.4	+25.9
Telephone Patient Navigation To Increase Postpartum Follow-Up Hepatitis B Care for Immigrants Living in New York City	52	73	+21
Outcomes of Childbirth Education in PRAMS, Phase 8	88.2	96.3	+18
Peer Mentor Mother Intervention to Improve Care Retention of Postpartum Women Living with HIV	45	63	+18
Patient Navigator to Improve Postpartum Care in an Urban Women's Health Clinic	70.3	88.1	+17.8
Queen Emma Clinic Postpartum Follow-up Initiative	71.7	86.1	+14.4
Postpartum visits at 2 and 6 weeks	58	70	+12
Electronic Health Record to Improve Cardiovascular Follow-Up After Hypertensive Disorder of Pregnancy	16	26	+10
Postpartum Nursery Visits by the Primary Care Provider	75	74.6	-0.4
Delivery and Payment Redesign to Reduce Disparities in High Risk Postpartum Care	-	-	72 (overall attendance rate)
Protocol-based midwifery-led care focused on individual women's physical and psychological health needs	-	-	11.06 (effect size cont of care)

Patient Intervention Trials and Subsequent Adherence to Postpartum Medical Visits measured by percentage of attendance (unless otherwise stated) organized in descending order of attendance rates.

Discussion

Several reports have shown the correlation of patient intervention and community outreach methods on increasing adherence to postpartum medical visits. The present study was designed to determine the most effective patient intervention for promoting greater healthcare utilization after delivery, though not necessarily the downstream effects of these patient navigation methods. The results of this review show a correlation between

the outcome of the aforementioned childbirth education program and a hospital-wide quality improvement initiative for postpartum hemorrhage with a respective 8.1% and 25.9% increase in postpartum medical visit adherence^{8,9}. A bundled care initiative consisting of a schedule log, postpartum check-in visits, and depression screening, and the Queen Emma clinic initiative corresponded with a respective 30% and 14% increase in postpartum follow-up attendance¹⁴. Additionally, a trial to implement an initial postpartum visit two weeks after delivery,

Table 3 Efficacy of Community Outreach Methods

Intervention	Intervention Penetration to Community (%)	Adherence (%)
Community-based distribution of misoprostol to prevent postpartum hemorrhage	79	82
Postnatal Home Visitation	76	90
Community-Based Primary Health-Care	-	-
Impact of Health visitors' postpartum home visit frequency on first-time mothers		
8 weeks	-	94.6
7 month-follow up	-	86.5
Precision Home-Visiting	-	-
Intervention penetration of community outreach methods and subsequent adherence to these protocols (measured by percentage)		

before the routine six-week visit, had no significant impact on attendance rates but rather decreased urgent clinic visits¹¹. The aforementioned delivery and payment re-design method and dyadic screening for postpartum depression amongst other complications of mothers at pediatric well-visits had a 72% and 85% postpartum visit adherence rate respectively^{13,15}. Treatment within a pediatric setting also correlated with greater than 90% receptivity of mothers to a referral for a psychologist¹⁵. Personalized physiological and psychological midwifery-led care had a mean of 11.06 (maximum of 14) for care continuity (MacArthur et al., 2003). Visits by the primary care provider to the nursery led to a .4% statistically negligible decrease in patient adherence, which suggests this intervention had no impact on patient adherence to postpartum visits¹⁷. The previously mentioned Navigating New Motherhood Intervention correlated with a 17.8% increase in patient adherence to postpartum medical visits¹². Moreover, telephone patient navigation for postpartum hepatitis-B care, electronic registry for cardiovascular follow-up, and a peer mentor mother program for HIV care retention increased adherence to postpartum care by 21%, 10%, and 18% respectively¹⁹⁻²¹.

Perhaps the most unexpected finding was the relationship between Medicaid extension into the postpartum period and attendance or a lack thereof to postpartum follow-up appointments. Though it was hypothesized that there would be increased attendance at postpartum visits following Medicaid coverage extension after delivery, this was only partially true for certain demographics. While the likelihood of Hispanic communities to utilize postpartum healthcare with the extension of Medicaid after pregnancy into the postpartum period increased by around

3.9%, that of Black communities decreased around 1.2%⁵. This draws attention to healthcare disparities amongst different social and racial demographics through which the extension of Medicaid cannot be fully effective to create equitable access to postpartum healthcare. While insurance and other disparities within various demographics are a detrimental factor in limiting adherence to postpartum medical care, this study is consistent with the finding that a bundled care initiative consisting of a schedule log, postpartum check-in visits, and depression screening for general adherence to routine postpartum follow-up appointments with a 30% increase in healthcare utilization, is potentially the most effective existing intervention to increase adherence to postpartum medical visits¹⁴. It is important to note that this study has not been able to demonstrate the impact of this intervention among various social and racial demographics around the globe due to the limited scope of this study within a particular hospital. Nevertheless, it is possible that this intervention could potentially be the most effective method of patient intervention to increase attendance at routine postpartum visits.

Moreover, these are particularly promising results for a patient intervention encouraging health care utilization by mothers after delivery that could potentially be implemented on a global scale. This study has found that the current most existing patient intervention for routine postpartum follow-up appointments is a comprehensive postpartum visit initiative. Addressing maternal health in pediatric settings also appears to be a very promising method of patient intervention which led to substantial increases in patient attendance by 29%. Further research is needed to test these interventions in a randomized control trial over a range of demographics to show their direct impact on patient adherence

to postpartum visits. Future studies also need to investigate alterations to tailor this program to different regions with accessibility to varying resources. Overall, these interventions provide healthcare providers and policymakers with the most effective interventions to be implemented in the future to greatly increase patient advocacy and accessibility of care thus reducing maternal mortality rates.

Research Methodology

Database and Search Engine: During this study, a systematic literature review was conducted using PubMed due to its specialization in public health. Utilizing this source of evidence, a review of all research that meets the aforementioned inclusion criteria was conducted, particularly focusing on research that analyzes the various methods of patient navigation around the globe and their efficacy in increasing adherence to postpartum medical visits.

Inclusion Criteria: In conducting this systematic literature review, the included studies contained data regarding maternal complications, community outreach methods to provide accessible medical care, clinical patient interventions to increase adherence to postpartum visits, or analysis of factors influencing healthcare utilization or a lack thereof. Included all methodology including surveys, questionnaires, implementation studies, statistical analysis, clinical trials, etc.

Exclusion Criteria: The scope of reviewed literature did not extend to articles in foreign languages, or articles solely focused on medication or prenatal care adherence. No articles were excluded based on statistical data or methodology.

Ethical Considerations: This study did not involve human subjects, and is purely based on peer-reviewed articles and thereby this study not to require an Internal Review Board. Further, we did not exclude any papers from this study based on their IRB.

Data Analysis: Data in the table was simply a presentation of information extracted from the articles, and is presented as descriptive analysis observing variables such as efficacy of community outreach methods.

Screening Methodology: The completion of this study involved two screenings, with the assistance of two reviewers, of all generated records identified by PubMed using the search terminology shown in Figure 5 above. The first screening eliminated all articles that did not meet the inclusion criteria with a review of the title and abstract. The second screening further narrowed the scope of included literature following a comprehensive review of the entirety of the remaining articles. In order to determine the relevance of the included literature, all articles were screened and assessed using JBI's quality assessment tool. After the assessment, no paper's were excluded based on quality. The article screening process for this study was through the use of a Preferred Reporting Items for Systematic Reviews

and Meta-Analyses (PRISMA) chart, and a data extraction table including variables such as geographic region, measured outcomes, study methodology, and patient intervention.

Conclusion

This study was undertaken to evaluate the various methods of patient navigation that have been implemented to increase adherence to postpartum medical visits, and conduct thorough analysis to determine which appears to be the most effective. The results of this research show that a bundled clinical care initiative involving a patient schedule log, postpartum check-in visits, and a depression screening at routine visits, correlated with the greatest increase in postpartum visit attendance rates. Thereby, the findings of this study provide evidence that this intervention is potentially the most effective patient intervention to increase postpartum healthcare utilization; however, this study was limited by the lack of a randomized control trial to show the direct correlation between this patient intervention and increased rates of postpartum adherence to medical visits. An additional uncontrolled factor of this study lies within the fact that this intervention's feasibility within differing demographics needs to be further investigated, after which the appropriate adjustments to this intervention should be made as necessary to allow this intervention to have an impact on a global scale. In spite of its limitations, this study makes promising strides towards establishing the most effective method of patient navigation which increases adherence to postpartum medical care. Larger randomized control trials among various demographics could provide more definitive evidence regarding this intervention's impact and feasibility around the globe. The findings of this study have a number of implications for future practice, namely establishing a baseline for defining the most effective method of patient intervention to which modifications can be made such that it would be feasible to implement this intervention on a global scale.

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Table 4 Search Terminology

Term Relevance	Search Term
Establishing Article Focus on the Postpartum Period	((“postpartum” [title/abstract]))
Postpartum Visit Adherence	((“visit” [title/abstract] OR “appointment” [title/abstract] OR “appointments”[title/abstract] OR “attendance”[title/abstract] or “adherence”[Title/Abstract]))
Postpartum Complications	(pre-existing illness[tw] OR infection(tw) OR sepsis[tw] or hemorrhage[tw] OR cardiomyopathy[tw] OR thrombotic pulmonary embolism[tw] OR stroke[tw] OR hypertension[tw] OR anesthesia complication*[tw] OR amniotic fluid embolism[tw] OR postpartum depression[tw] OR depression [tw] OR anxiety[tw] OR [mental health] OR postpartum psychosis[tw] OR psychosis[tw]))
Postpartum Patient Interventions	((“intervention”[title/abstract] OR “interventions”[title/abstract])
Final Search Term	((“postpartum” [title/abstract]) AND ((“visit” [title/abstract] OR “appointment” [title/abstract] OR “appointments”[title/abstract] OR “attendance”[title/abstract] or “adherence”[Title/Abstract])) AND (pre-existing illness[tw] OR infection(tw) OR sepsis[tw] or hemorrhage[tw] OR cardiomyopathy[tw] OR thrombotic pulmonary embolism[tw] OR stroke[tw] OR hypertension[tw] OR anesthesia complication*[tw] OR amniotic fluid embolism[tw] OR postpartum depression[tw] OR depression [tw] OR anxiety[tw] OR [mental health] OR postpartum psychosis[tw] OR psychosis[tw])) AND (“intervention”[title/abstract] OR “interventions”[title/abstract])

Table 5 Data Extraction of Included Articles

Intervention/Subject	Theme	Study Methodology
Impact of Postpartum Depressive Symptoms on Maternal Health Practices	Factors influencing adherence rates	Multiple logistic regression
Community-based distribution of misoprostol to prevent postpartum hemorrhage	Community outreach	Community mobilization
Childbirth education	Patient intervention	-
Family Connects (FC) program	Community outreach	RCT
Maintaining Medicaid eligibility in the later postpartum period	Factors influencing adherence rates	Regression analysis
Hospital-wide, bundled quality improvement initiative	Patient intervention	-
Postpartum home care service	Community outreach	RCT
Schedule logs, telehealth check-in visits within 1-3 weeks postpartum	Patient intervention	Quality initiative
Community-based primary health care (CBPHC) Queen Emma Clinic bundled care initiative	Community outreach	Comprehensive systematic review
Decreasing the time to an initial postpartum visit from 6 weeks to 2 weeks	Patient intervention	Retrospective chart review
Health visitors' postpartum home visit frequency	Patient intervention	Parallel, randomized, non-blinded trial
Lifelong antiretroviral therapy (ART)	Community outreach	Cluster randomized trial
Innovative program to improve postpartum care	Factors influencing adherence rates	Cross-sectional survey
Detection and management of maternal depression at well-child visits	Patient intervention	-
Texting and offering free consultations	Patient intervention	-
Educational intervention for pediatric residents	Factors influencing adherence rates	Cohort study
Protocol-based midwifery-led care	Patient intervention	Outcome measurement before and after
Postpartum visit between mother and neonate's future primary care provider	Patient intervention	RCT
Navigating New Motherhood, a postpartum patient navigation program	Patient intervention	Prospective RCT
Retention challenges among women living with HIV in Tanzania	Patient intervention	Prospective observational study
Women's care-seeking experiences after referral for postpartum depression	Patient intervention	-
Culturally appropriate telephone patient navigation services	Factors influencing adherence rates	Qualitative descriptive
Outreach communication	Patient intervention	Quasi-experimental study
Peer mentor mother program	Patient intervention	Observational study
Precision home visiting	Qualitative study	-
Evaluating outcome expectancies, facilitators, and barriers to ART adherence	Community outreach	Pilot randomized Hybrid Type 3 implementation trial
Health visitors' perception on their role to assess and manage postpartum depression cases	Patient intervention	Qualitative
	Community outreach	-

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