Volume 3, Issue 10, 2025

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

NURSE LED INTERVENTIONS FOR REDUCING MATERNAL MORTALITY RATE IN LOW INCOME AREAS

Suriya Bashir[*1], Aqsa Yasmeen[2], Sidra Kalsoom[3], Anum Shehzadi[4], Zaiba Zunmbeel[5], Syeda Tabassum[6]

[1-6]*Department of Nursing, University of Science and Technology, Lahore, Pakistan*

[*1]suriyabashir500@gmail.com

DOI: https://doi.org/10.5281/zenodo.18798073

Keywords
Interventions by nurses, Maternal mortality, Community awareness, Healthcare resources, Low-income areas

Article History
Received on 20 Nov 2025
Accepted on 29 Nov 2025
Published on 29 Dec 2025

Copyright @Author
Corresponding Author: *
Suriya Bashir

Abstract

Background: Maternal mortality remains a significant health issue in low-income communities, largely due to limited access to quality maternal healthcare services, inadequate medical facilities, and insufficient community awareness. Nurses play a central role in maternal health through prenatal care, safe delivery practices, postnatal support, and community education. This study examined the effect of nurse-led care on maternal mortality, identified barriers to implementing such interventions in resource-constrained settings, and explored the importance of autonomy, education, and training of nurses in improving maternal health outcomes. Methodology: A quantitative cross-sectional research design was adopted. A total of 385 nurses completed a structured questionnaire based on a five-point Likert scale. The instrument assessed nurse-led interventions, availability of healthcare resources, community involvement, and maternal mortality prevention. Data were analyzed using SPSS through descriptive statistics and Pearson correlation analysis. The instrument demonstrated high reliability with a Cronbach alpha value of 0.973. Results: Nurse-led interventions, healthcare resource availability, community awareness and engagement, and maternal mortality reduction showed high mean scores (20.15, 20.85, 20.82, and 20.61, respectively). Significant positive correlations were found between nurse-led interventions and maternal mortality reduction ($r = 0.752$, $p < 0.001$), healthcare resource availability and maternal mortality reduction ($r = 0.843$, $p < 0.001$), and community awareness and engagement and maternal mortality reduction ($r = 0.867$, $p < 0.001$). Conclusion: The findings indicate that nurse-led interventions, supported by adequate healthcare resources and strong community participation, are critical in reducing maternal mortality in low-income communities. Strengthening nurses' autonomy, education, and training, along with improving resource availability and community engagement, is essential for achieving better maternal health outcomes.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

INTRODUCTION

Maternal mortality is one of the most urgent health issues in the world, especially in low-income territories where the lack of quality health services and skilled medical workers heightens the chances of the intervention (WHO, 2021). The term maternal mortality is used to refer to the death of a female at any point during the pregnancy or 42 days after pregnancy termination, regardless of the length and location of pregnancy or the manner in which the pregnancy was handled. Global action to address the issue has seen about 287,000 women die annually as a result of complications during pregnancy and delivery and 95% of these fatalities happened in low and middle-income nations (Russo, 2022; Wojcieszek et al., 2023).

The high maternal mortality ratio (MMR) is located in sub-Saharan Africa and South Asia, and is a major concern due to the high number of maternal deaths that have been experienced. Poverty, education levels, gender disparity, poor healthcare facilities, and cultural constraints are some of the factors that result in ineffective maternal care (Khan, 2020; Nove et al., 2024). In most of such environments, nurses and midwives are the foundation of healthcare services as they offer vital services such as antenatal services, skilled birth attendance and the postnatal follow up (Akbar & Hayat, 2020; Boukhalfa et al., 2024).

The Competent midwives, such as nurse-midwives, can be used to find 87 percent of necessary maternal and newborn healthcare, including nurse-midwives, who play a central role in decreasing the rate of maternal mortality (Ismail & Ali, 2020; Jacobs et al., 2024; Quader, 2024). Nurse-led interventions are those interventions, programs, or clinical practices that are mainly developed and put into practice by nurses to solve certain health complications in communities. These interventions are applied in terms of maternal health to promote antenatal care, better delivery results, more family planning access, and postnatal follow-up (Souza et al., 2023).

Nurse-led models of care have proven to be very successful in the closure of healthcare disparities in low-income neighborhoods, through provision of culturally sensitive, community-based, and economical care. Indicatively, community outreach programs that are led by the nurse have been effective in helping to diagnose high-risk pregnancies early and refer them to the higher-level care facility in time (Mehdi, 2019; Modupe, 2021; Radovich, 2024; Yinusa & Ogoun, 2024).

Inequality in maternal healthcare access is a byproduct of inequality in the socioeconomic system across the world. Most maternal deaths are reported in rural and remote regions with low-income countries usually having a shortage of skilled health workers (Gausman et al., 2023). The existing lack of physicians in these areas creates the necessity of expanding the functions of nurses and midwives so that the much needed maternal care services are provided. Nurse-led interventions are therefore a practical and evidence based solution to the problem of health workforce limitations. Health systems can do this by giving more power to nurses by providing them with specialized training and supervision to maximize maternal health outcomes (Hameed, 2020; Ismaila et al., 2021).

A community-oriented nature of nurse-led maternal health interventions is one of the main strengths. The nature of the communities that the nurses serve makes them live in or near the community they serve, thus allowing them to develop trust, culture dynamics, and provide customized health education (Akbar & Hayat, 2020; Gondokesumo et al., 2021; Carlo, 2025). This community involvement is especially essential in dealing with the misperceptions of pregnancy, childbirth and family planning that usually causes women to shun away timely care. The research indicates that the use of health education by nurses and midwives has enhanced maternal knowledge regarding prenatal check-ups, warning symptoms, and nutrition, thus enhancing seeking of health care (Ufaq, 2019;

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Modibbo & Inuwa, 2020; Saha & Laisram, 2022; Marc & Roussel, 2024).

ANC is recognized as an important foundation of maternal health and nurse-led models provide impressive results in covering ANC in low-resource areas. As an example, the rural Uganda and Bangladesh nurse-managed clinics have offered convenient and ongoing prenatal, such as blood pressure, infection screening, and safe delivery practices counseling (Raja & Iqbal, 2019; Leta et al., 2025). Furthermore, task-shifting policies supported by WHO enable nurses and midwives to engage in such traditional physician-only activities as the management of hypertensive disorders of pregnancy and emergency obstetric care under specified procedures (Rojas-Suarez & Paruk, 2024).

The fourth trimester, or postpartum period, is another period with critical outcomes where nurse interventions can have a great impact on the outcomes of the mother. A high number of maternal deaths happen in 48 hours of delivery because of blood loss, sepsis, or hypertension (Say et al., 2025). House calls by nurses in this time frame offer an opportunity to detect the signs of danger in time, breastfeeding assistance, and psychological counseling, particularly to the mothers with postpartum depression. The findings in Kenya and Nepal show that nurse-led postnatal care programs have been effective in minimizing postpartum complications by increasing a follow-up rate and raising maternal self-care awareness (Muhammad & Yan, 2019; Rehman & Malik, 2020; Radovich, 2024; Marc et al., 2025).

Apart from clinical interventions, nurse-led programs are crucial for bolstering health systems and advocating for policies. Beyond providing patient care, nurses are involved in the creation of policies, procedures, and community-based health monitoring programs and practices (Ali & Senturk, 2019). In low-income nations, nurses frequently serve as the chair of review panels for maternal deaths and collaborate with community health professionals to determine the underlying reasons of death (WHO, 2023a).

In low-income communities, maternal mortality is still a significant public health concern because to the lack of a competent workforce, poor healthcare infrastructure, and restricted access to high-quality maternity services. Preventable pregnancy-related problems still claim the lives of over 287,000 women each year, with 95% of these deaths taking place in areas with limited resources, despite international initiatives like SDG 3.1 to minimize maternal mortality (Weiland et al., 2021).

Objectives of the study

this study were objectives to determine the effects of nurse-led prenatal, postnatal, and intrapartum care on maternal mortality reduction in low-income communities, challenges that face nurses in the implementation of maternal health interventions in resource-limited areas, and how autonomy, education, and training of nurses could enhance the delivery of maternal health services.

LITERATURE REVIEW

Maternal mortality still remains one of the biggest health problems in world. The WHO (2023) states that about 95 percent of all maternal deaths happen in the low- and middle-income countries (LMICs), and most of them are caused by avoidable conditions, including hemorrhage, hypertensive disorders, sepsis, and obstructed childbirth. Inefficient access to quality care in the course of pregnancy and birth has continued to be the most significant factor of maternal mortality in those areas (WHO, 2023b).

Nurse-based interventions, such as community midwifery, antenatal outreach and postnatal follow-up at home and continuum care models have been found to be effective in enhancing the outcome of maternal health. The involvement of nurses and midwives in LMICs has an enormous impact on the reduction of maternal and neonatal deaths. Nonetheless, this can only be attained by proper training, supervision, referral networks, and

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

empowering health-system infrastructure (Vaivada et al., 2022)

Various conceptual models are often used in the literature to describe the process of nurse-led interventions in preventing maternal deaths. The Quality-of-Care Framework is a framework for evaluating the structure, process, and outcome domains. In this model, care delivery processes (timely risk detection, emergency management) are affected by nursing resources (structure) and ultimately have an impact on maternal outcomes (López Ramírez et al., 2021).

Continuum-of-Care Framework on maternal and newborn health focuses on care during the prenatal period as well as in the postpartum. Continuity models led by nurses or midwives (that is, when the same provider or team accompanies women through their course) build trust, allow prompt identification of complications and referrals (WHO, 2022). WHO Quality-of-Care Framework of Maternal and Newborn Health emphasizes the skills and respectful care and system supports, including supplies, governance, and data use. This model informs the majority of modern maternal programs led by nurses (Birhane et al., 2024).

The Social Determinants of Health Model is an overlay to clinical models because it focuses on the socioeconomic elements underlying such clinical domains like poverty, transport, gender inequity, that nurse-based community outreach and health education frequently focuses on (Solar et al., 2024).

Vaivada et al. (2022) engaged in a systematic review of intervention packages undertaken by communities in the LMICs. Their results showed that there were big decreases in the maternal and neonatal morbidity and mortality in cases where the nurses or community midwives attended to the antenatal and postnatal visits, counseling, and referred linkage.

Johnson et al. (2021) conducted a scoping review of interventions that met the criteria of Sustainable Development Goal 3.1 (reducing global MMR). The research highlighted the significance of nurse led emergency obstetric triage and community midwifery programs to enhance access to life saving care. According to Adnani et al. (2025) continuity midwifery teams have been found to increase the rates of spontaneous vaginal birth and breastfeeding initiation, and reduce obstetric interventions and delays in care indirectly reducing the risk of maternal mortality.

In Pakistan, Naz et al. (2024) analyzed the community midwife initiatives and found weaknesses such as lack of supervision, equipments, and referral systems. The research found that community nurses should be empowered by having sufficient resources and authority to realize a significant decrease in maternal death.

Lastly, Li et al. (2021) demonstrated that nations with high nurse-to-population rates and a positive health policy on maternal health experience a faster decrease in MMR. The study associated an increase in manpower and the ongoing education with the improved maternal health insurance.

METHODOLOGY

In this study of realism, the hypothesis is that there exists the reality without our perceptions. It offers a comprehensive explanation of social phenomena through the combination of both the subjective experience and objective frameworks. This paper implies that the nurse-led intervention in the reduction of maternal mortality rate in low-income communities can be measured and determined by the access to skilled care, the ability to refer to the health clinic in time, health education, the opportunity to access the necessary resources. The realist approach allows conducting a systematic study of the causes and outcomes of maternal mortality and how nursing actions influence them based on empirical evidence (Clark et al., 2021).

The objectivist approach to the acquisition of knowledge will be used in this study. This will serve the aim of the research, which is to investigate nurse-led interventions to reduce the rate of maternal mortality in low-income neighborhoods as a

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

quantifiable and testable fact. It enables the quality of these interventions to be evaluated in an objective way via quantifiable maternal health outcomes, regardless of individual beliefs, perceptions and biases. (Bourne, 2024).

The current study rests on positivism which is a philosophical view that promotes the objective study of variables that are measurable and events that are observable. Positivism paradigm underlines accuracy of observation and statistical analysis to explain events and is thus fit in a research that seeks to establish correlations or difference between variables (Maxwell, 2022).

This study will be based on the cross-sectional study design where it will investigate the effectiveness of nurse-led intervention in the reduction of the maternal mortality rate in low income localities. The cross-sectional method entails the gathering of information at one instance in time; that is, it gives a picture of the current practices and outcomes of maternal health. This design will enable one to identify patterns and correlations between maternal health and nursing care by evaluating the prevalence and effect of nurse-led intervention in the form of antenatal education, skilled birth attendance, emergency referral systems and postnatal follow-up.

The target population will include the registered nurses who are employed in low-income maternal and child health services. These nurses are chosen as they are the key agents of the nurse-led interventions involving healthcare resource access, community awareness and involvement, and maternal death.

All registered nurses who offer maternal and child health care services in low-income regions will be the target population of this study. This will involve nurses who work at the tertiary care hospitals that cater to the economically deprived communities. These nurses are of interest since they are the actual ones who are to execute the nurse-led interventions to enhance the maternal outcomes and decrease the maternal mortality.

Nonprobability sampling that PM employed in this research is the convenience sampling approach because it is likely to be conducted in a hospital setting where patients can be readily contacted.

This research determined the size of the sample based on Cochran formula (Chaokromthong and Sintao, 2021). The expected sample size was thus estimated to 385 registered nurses. When the total number of nurses serving the chosen regions of low income is known then a finite population correction might have been used but since the target population is large the size of the sample used was found to be enough to guarantee adequate representation to conduct the study.

The sampling unit in this study is individual registered nurses who are already offering maternal and child health services in some of the low-income neighborhoods. These nurses were the focus of data collection, and structured questionnaires were applied to assess the availability of healthcare resources, engagement and awareness of the community of knowledge, and nurse-led interventions. The nurses are individual sampling units and this will give the researcher an idea of how these factors affect maternal mortality reduction in the practice of nursing leadership.

Registered nurses offering maternal and child health services in the target areas (selected based on their low-income level) were invited to take part in the research based on the established sampling unit after the synopsis was approved by the review committee. The data was collected through a convenient sampling method. The participants were informed about the purpose of the study and prior permission to participate was taken by signing a written informed consent form (Annexure 1). To protect the ethical rights of the participants, the confidentiality was assured.

The main instrument of data collection was a structured questionnaire (Annexure 2). In order to make the questionnaire valid and relevant to the study objectives, it was created on the basis of the relevant studies, literature review (Ernest et al., 2025), and the input provided by the supervisor to whom this questionnaire was allocated. The

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

responses were rated on a five-point Likert scale, where 1,2,3,4,5 when the response is strongly disagree, disagree, neutral, agree and strongly agree respectively.

The questionnaire comprised five sections which included: Section I: Demographics - age, gender, qualification, years of experience, and workplace. Section II: Nurse-Led Interventions - shedding light on the nature, frequency, and perceived efficacy of interventions applied by nurses. Section III: Healthcare Resource Availability- assessing access, sufficiency and use of resources in healthcare services of maternal and child health. Section IV: Community Awareness and Engagement - evaluating the perceptions of nurses about the community involvement, educational and community awareness activities. Section V: Maternal Mortality Reduction- evaluating the effectiveness of nurse-led interventions on the health outcomes and mortality reduction of mothers.

The researcher collected the completed questionnaires after receiving responses of the participants. These data were subsequently summarised and discussed as an attempt to learn how the availabilities of the healthcare resources, community involvement, nurse-led interventions, and decreased maternal mortality in low-income communities are interconnected.

In this research SPSS version 21.0 was taken as input and analysis data. The program simplified data collection, administration and statistical analysis. Descriptive statistics were used to sum up the demographics of the sample and prevalence of chronic fatigue among nurses with means, frequencies, percentages, and standard deviations. The importance of the findings would also be determined through the correlation of variables through inferential statistical tests, including chi-square tests or other tests.

To make sure that the data collected was relevant to the study objectives, the structured questionnaire applied in this study was created on the basis of the literature, past research (Ernest et al., 2025), consultation with the supervisor assigned, and the Nurse-Sensitive Outcome Indicators (NSOIs) to guarantee that the questionnaire was valid and reliable regarding the objective of the study (Choi, 2024). The questionnaire will evaluate nurse-led interventions, the availability of healthcare resources, their awareness and involvement of the community, and how they perceived it affecting the reduction of maternal mortality.

The rating of the perceptions of the respondents was conducted on a five-point Likert scale, where the answers were in the range of Strongly Disagree and Strongly Agree. The rating was conducted to the participants regarding their experiences and practices in delivering maternal and child health services in low-income areas.

The NSOIs instrument enables the study to obtain outcomes that were directly sensitive to the nursing care such as maternal health outcomes, effective interventions implementation, patient safety, and quality of care. The questionnaire offers a uniform and evidence-based way to measure the contribution of nurse-led interventions to the reduction of maternal mortality and enhancement of the overall care of the mother in resource-restricted settings through the incorporation of NSOIs (Choi, 2024).

The goal of this measurement tool is to gather standard and credible data among registered nurses in order to determine the correlations between nurse-based interventions, healthcare resources, and community involvement and health care delivery in terms of maternal mortality mitigation, in the low-income localities.

RESULTS

This chapter gives descriptive statistics findings of the research availed under the name of Nurse-Led Interventions to Reduce Maternal Mortality Rate in Low-Income Areas. The analysis of data was carried out with the help of SPSS. They were descriptive statistics, reliability analysis, and correlation analysis. Tables and figures are referred to in a consecutive order.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

The respondents that took part in the study were 385. The demographic variables (age, gender, qualification, and length of service) were analyzed using descriptive statistics.

Most of the respondents (51.7, n =199) were aged between 26 and 45 years with a proportion of 25.7% (n=99) who were below the age of 25 as presented in Table 1. The sample size of the respondents was 20.5% (n= 79) that fell within the age group of 46-55 years and only 2.1% (n=8) respondents were older than 56 years.

It brings out the fact that majority of the participants were within the economic active and professionally productive age bracket.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Table 1: *Age Distribution of Respondents (N=385)*

Age Group	Frequency	Percentage	Cumulative %
Up to 25 years	99	25.7%	25.7%
26–45 years	199	51.7%	77.4%
46–55 years	79	20.5%	97.9%
Above 56 years	8	2.1%	100%

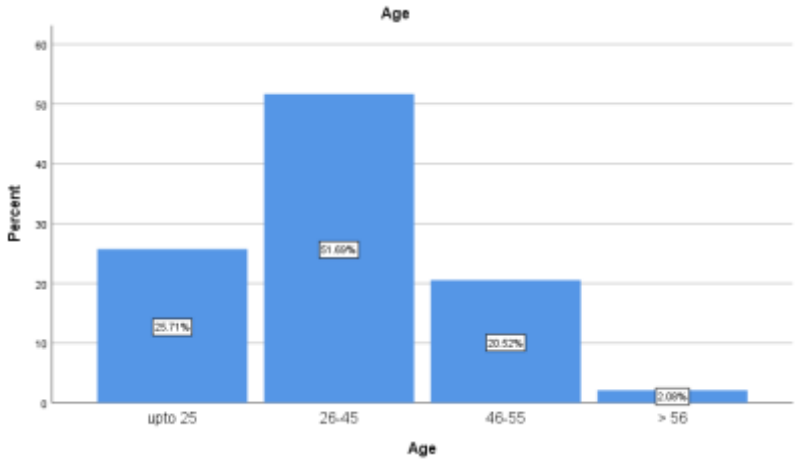


Figure 1: Bar Chart Showing Age Distribution

Table 2 revealed that the sample was majorly female. The majority of the respondents were female (88.6; n = 341), and the female participants were outnumbered by the males (11.4; n = 44) by a significant margin. This is a feminine ratio because the nursing profession is predominantly female especially in the services related to maternal healthcare.

Table 2: *Gender Distribution of Respondents*

Gender	Frequency	Percentage
Male	44	11.4%
Female	341	88.6%

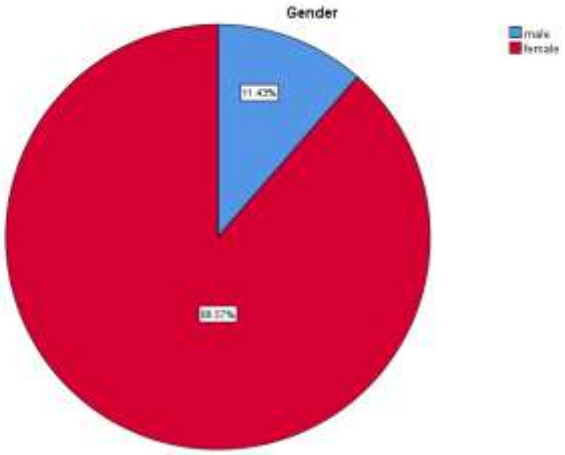


Figure 2: Pie Chart of Gender Distribution

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Table 3 shows the educational profile of the respondents. 37.8% (n = 145) held a Bachelor's degree, 32.8% (n = 126) had a Master's degree, 13.5% (n = 52) possessed a Ph.D and other qualifications had = 55, percentage = 14.3. This distribution shows that most of the respondents were qualified which makes their perception about nurse-led interventions more credible.

Table 3: ***Educational Qualification of Respondents***

Qualification	Frequency	Percentage
Bachelor	145	37.8%
Master	126	32.8%
PhD	52	13.5%
Others	61	15.9%

Table 4 indicates that over half of the respondents (54.4, n = 209) had a period of service of not more than 1 year, and 38.5 (n = 148) had a period of service of 2-5 years. Only 7.0% (n = 27) had 6–10 years of service. This implies that a significant percentage of the respondents were new-career nurses, which highlights the significance of training and nurse-oriented programs.

Table 4: ***Length of Service of Respondents***

Length of Service	Frequency	Percentage
Up to 1 year	209	54.4%
2–5 years	148	38.5%
6–10 years	27	7.0%

Cronbach's Alpha was used to test the internal consistency of the questionnaire. Table 5 has demonstrated that the overall reliability coefficient of the scale of 20 items was 20 = 0.973, which represents excellent internal consistency. This is in confirmation of the fact that the measure is very reliable in the measurement of the nurse-led interventions, healthcare resources, community participation, and the reduction of maternal mortality.

Table 5: ***Reliability Statistics***

Cronbach's Alpha	Number of Items
0.973	20

The measures of responses were five-point Likert scale. Scores were categorized as: Low: 5–11, Moderate: 12–18 and High: 19–25. As demonstrated in Table 6, the calculated variables depicted a large mean score which was good to show the level of commonality among the respondents. These results indicate that interventions that are led by nurses, sufficient resources, and involvement of the community are highly practiced and their effectiveness is seen to be effective in reducing maternal mortality.

Table 6: ***Descriptive Statistics of Computed Variables***

Variable	N	Mean	Interpretation
Nurse-Led Interventions	372	20.15	High
Healthcare Resource Availability	379	20.85	High
Community Awareness & Engagement	377	20.82	High
Maternal Mortality Reduction	376	20.61	High

A Pearson correlation test revealed a strong positive correlation between nurse-led interventions and maternal mortality reduction ($r = 0.752$, $p < 0.001$), as shown in Table 7.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

This indicates that increased nurse-led care significantly contributes to improved maternal health outcomes.The relationship between healthcare resource availability and reductions in maternal mortality was also strong and statistically significant ($r = 0.843$, $p < 0.001$), as shown in Table 4.7. This finding highlights the critical role of adequate equipment. A very strong positive correlation was observed between community awareness and maternal mortality reduction ($r = 0.867$, $p < 0.001$), as shown in Table 4.7. This suggests that community engagement, education, and nurse–community collaboration are key factors in reducing maternal deaths.

Table 7: ***Correlation between Study Variables and Maternal Mortality Reduction***

Independent Variable	Dependent Variable	Pearson r	p-value
Nurse-Led Interventions	MMR	0.752	<0.05
Healthcare Resources	MMR	0.843	<0.05
Community Awareness	MMR	0.867	<0.05

DISCUSSION

This paper has considered the impact of nurse-based interventions in lowering the maternal mortality rate in the low-income neighborhoods, especially the access to healthcare resources and awareness and involvement of the community. The analysis of the data of 385 respondents using a quantitative cross-sectional design helped to learn how the nursing leadership, systemic support, and community involvement can improve the outcomes of the maternal health.

The results showed that most of the respondents were nurses (88.6%), and most of them were female nurses, and this is similar to the world and national population of nurses especially in maternal and child health services. The same gender distributions were reported in the nursing research in low- and middle-income nations (WHO, 2024) The majority of the respondents were of age 26-45 indicating that the respondents were at their best working ages. This population trend correlates with the results provided by Yoshida et al. (2025) who pointed out that mid-career nurses are critical to the provision of maternal care because of their clinical competence and versatility. Also, a significant percentage of the respondents possessed a bachelor and master level education indicating the presence of well qualified workforce. It has been demonstrated in previous research that maternal outcomes and clinical decision-making are linked to higher educational preparation of nurses (Gordon et al., 2025).

The internal consistency of the questionnaire was high and its Cronbachs alpha was 0.973. This value is greater than the acceptable level of 0.70, which means that the instrument was valuable at measuring the constructs of the nurse-led interventions, availability of healthcare resources, community involvement, and maternal mortality reduction. These consequences are in line with earlier study where scholars used similar Likert-scale instruments to evaluate nursing leadership and maternal health outcomes (Ernest et al., 2025; Mohammed et al., 2025). The reliability is high, which enhances the validity of the study findings and justifies the application of this instrument in future studies.

The researchers found a positive significant strong correlation ($r = 0.752$, $p < 0.001$) between the interventions led by nurses and a decrease in maternal mortality. It means that the increased nurse participation in the antenatal care, safe deliveries practices, postnatal follow-ups and health education play a significant role in improving maternal outcomes. The findings of Afefy (2025) are highly substantiated by these findings since they found that nurse-led models of care were effective in reducing complications associated with pregnancy and mortality in mothers, especially in underserved groups. On the same note, empowering nurses to become the leaders of maternal health services are

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

cost-effective and sustainable interventions in reducing maternal mortality in low-resource contexts (WHO, 2024).

The positive relationship between healthcare resource availability ($r = 0.843$, $p < 0.001$) and maternal mortality reduction was very high. This means that adequate resources of medical supplies, required medication, adequate manpower and functional infrastructures are relevant factors of effective nurse-led interventions. This finding aligns with Mohammed et al. (2025) who found out that the inability to handle obstetric emergencies and provide continuous care to a mother is mostly compromised by the scarcity of available resources that nurses must deal with. Another claim of the WHO that is confirmed by the present research is that health system fortification, combined with the effective leadership of nursing is a precondition to achieve the goal of safe motherhood (Ernest et al., 2025).

The best variables that were associated with a decrease in maternal mortality ($r = 0.867$, $p < 0.001$) were community awareness and community engagement. This highlights the importance of community education, cultural acceptance, male involvement, and nurse community involvement on the improved maternal health outcomes. The findings are in line with Vamos et al. (2023) who have established that community-based maternal health programs led by nurses are helping a lot to improve the use of services and early detection of complications. Additionally, Catalao et al. (2025) have indicated that culturally sensitive community engagement interventions have shown to increase the level of trust in healthcare providers and the effective delivery of timely maternal services.

This close relationship in the current study indicates that clinical interventions alone cannot yield any positive result in terms of reducing maternal mortality, but instead, the community needs to be actively involved with the help of effective nursing leadership. In general, the results of this research are supported by the evidence of the world that nurse-led care, accompanied by sufficient resources and the involvement of the local community, results in significant changes in the maternal health outcomes. The current research, unlike some of the previous ones, which looked at these factors separately, has offered a detailed analysis of the factors together with their interconnected and interactive impacts on the reduction of maternal mortality.

The large mean values of all calculated variables also imply that the respondents highly perceive using nurse-led interventions as effective, which confirms the increasing global trend of involving the nursing profession in providing maternal healthcare to women (Afefy, 2025; WHO, 2024). This research has implication, due to its findings on healthcare policy and nursing practice. It should first aim at reinforcing the nursing-based models of prenatal care, adequate healthcare facilities and investing in community awareness programs at low-income settings in particular. Policymakers need to consider nurses as the main leaders in maternal health policies and provide them with the chances of continuous professional growth to obtain even more power.

CONCLUSION

The study came to the conclusion that nurse-led interventions have a significant impact in reducing instances of maternal deaths among the low-income communities. The findings show that the positive relationships between nurse-led care, access to healthcare resources, community awareness, and maternal mortality reduction are high. The overall score of the study variables is high and it indicates that most of the respondents concur on the effectiveness of nurse-led maternal healthcare services.

The reliable analysis was employed to make certain that the research instrument is sound, but the demographic data showed that the nursing workforce is predominantly female, well-educated, and includes professionals at the entry level in the majority. These characteristics mean the greatness of

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

workforce in the nursing field on the one hand and the need of constant training and professional growth on the other hand.

All in all, the results demonstrate the significance of an array of skilled nurse-based interventions, adequate access to healthcare sources, and community participation in the process of maternal mortality reduction. These elements are strengthenable and this will lead to sustainable adjustments in terms of maternal health outcomes within low-income settings.

In the light of the present study, it can be advised that healthcare policymakers and administrators should reinstate nurse-led maternal health programs especially in low-income neighborhoods because such programs have proved to make a significant difference in the maternal mortality rates. Ongoing professional growth and formal training should also be incorporated to improve the skills of the nurses in the beginning of their careers to provide high-quality care to mothers. Also, the health facilities have to be sufficiently prepared with the necessary medical equipment, resources, staffing, and supplies to sustain effective nurse-led services.

This study is not without limitations even though the findings represented are significant. The cross-sectional nature limits the possibilities of making causal relationships between nurse-led interventions and maternal mortality reduction. The research group was primarily represented by the early-career nurses and it might have a negative influence as the researcher may not be able to generalize the findings to more experienced medical workers. Moreover, the target population being low-income might limit the extrapolation of the findings to urban or more resourceful healthcare environments.

These limitations should be overcome in future studies to give a more in-depth idea about the nurse-led maternal health interventions.

REFERENCES

Adnani QES, Nurfitriyani E, Keb ST, Argaheni NB, Maulina R, Adepoju VA, O'Connell M. What is midwifery work in low and middle-income countries? A systematic review to enhance midwifery practices in resource-constrained contexts. J Asian Midwives (JAM). 2025;12(1):126-157.

Adnani QES, Nurfitriyani E, Merida Y, Khuzaiyah S, Okinarum GY, Susanti AI, Adepoju VA, Hashim SH. Ninety-one years of midwifery continuity of care in low and middle-income countries: a scoping review. BMC Health Serv Res. 2025;25(1):463.

Afefy N. The effectiveness of nurse-led antenatal education on maternal self-efficacy: an evidence-based approach. 2025.

Akbar R, Hayat A. Psychological health of children engaged in hazardous labor: A study in Lahore, Pakistan. J Policy Options. 2020;3(2):70-74.

Ali A, Senturk I. Justifying the impact of economic deprivation, maternal status and health infrastructure on under-five child mortality in Pakistan: An empirical analysis. Bull Bus Econ. 2019;8(3):140-154.

Birhane BM, Assefa Y, Belay DM, Nibret G, Munye Aytenew T, Liyeh TM, Gelaw KA, Tiruneh YM. Interventions to improve the quality of maternal care in Ethiopia: a scoping review. Front Glob Womens Health. 2024;5:1289835.

Boukhalfa C, Ouakhzan B, Masbah H, Acharai L, Zbiri S. Investing in midwifery for sustainable development goals in low-and middle-income countries: a cost-benefit analysis. Cost Eff Resour Alloc. 2024;22(1):1.

Bourne PA. Epistemology and education. 2024.

Carlo D. Economic activity, carbon emissions, and health outcomes: A cross-national study of OIC and non-OIC countries. J Bus Econ Options. 2025;8(4):47-57.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Catalao R, Kebede L, Mulushoa A, Eshetu T, Medhin G, Abdella A, Alem A, Keynejad RC, Sandall J, Howard LM. Exposure to trauma in pregnant women and its association with previous perinatal complications, IPV and antenatal service satisfaction in rural Ethiopia: a cross-sectional facility-based study. PLoS One. 2025;20(9):e0319362.

Chaokromthong K, Sintao N. Sample size estimation using Yamane and Cochran and Krejcie and Morgan and Green formulas and Cohen statistical power analysis by G*Power and comparisions. Apheit Int J Interdiscip Soc Sci Technol. 2021;10(2):76-86.

Choi H. Nursing-sensitive outcomes: a concept analysis. Nurs Econ. 2024;42(6):.

Clark T, Foster L, Bryman A, Sloan L. Bryman's social research methods. Oxford: Oxford University Press; 2021.

Ernest S, Babu R, Anitasari MB. Nursing interventions in reducing maternal mortality rates: SDG 3 & SDG 11. Vasc Endovasc Rev. 2025;8(4s):77-85.

Faris SH, Al-Abedi GA, Mansoor HI. Health promotion activities among older women: insights from Pender's health promotion model. .

Fikre R, Gubbels J, Teklesilasie W, Gerards S. Effectiveness of midwifery-led care on pregnancy outcomes in low-and middle-income countries: a systematic review and meta-analysis. BMC Pregnancy Childbirth. 2023;23(1):386.

Gausman J, Pingray V, Adanu R, Bandoh DA, Berrueta M, Blossom J, Chakraborty S, Dotse-Gborgbortsi W, Kenu E, Khan N, et al. Validating indicators for monitoring availability and geographic distribution of emergency obstetric and newborn care (EmoNC) facilities: a study triangulating health system, facility, and geospatial data. PLoS One. 2023;18(9):e0287904.

Gondokesumo ME, Putra GS, Suhud F, Sulistyowaty MI. In-silico studies and synthesis of 1,3-benzoxazine derivatives as antimalarial agent through PfATP4 receptor inhibition. Int J Pharm Res. 2021;12(2):.

Gordon RDA, Kishi A, Brown JA, Voisin C, Thomas N, Riley SR, Fareed N, Bunger A, Gillespie SL, Venkatesh KK. Rural maternal health interventions: a scoping review and implications for best practices. J Rural Health. 2025;41(1):e70007.

Hameed S. Impact of violence on children's learning abilities: Evidence from Punjabi society. J Policy Options. 2020;3(2):61-69.

Ismail K, Ali B. Understanding the nexus of job satisfaction, job-related stress, and employee performance: A study in the nursing sector of Lahore, Pakistan. J Policy Options. 2020;3(1):26-34.

Ismaila Y, Bayes S, Geraghty S. Barriers to quality midwifery care: a systematic review and meta-synthesis of qualitative data. Int J Childbirth. 2021;11(3):.

Jacobs A, Thomas M, Casper G. Maternal and perinatal health and the impact on children. In: Children around the world: the future of our earth. 2024. p. 49.

Johnson J, Mondal A, Chelva S, Thakur P, Tiwari M, Lal A, Upreti D. Evidence-based nursing interventions in promoting safe motherhood: a review. Int J Environ Sci. 2021;11(23s):2025.

Khan KK. Assessing the impact of climate change on women's health: A case study in Lahore, Punjab, Pakistan. J Policy Options. 2020;3(3):82-89.

Kubota S, Ando M, Murray J, Khambounheuang S, Theppanya K, Nanthavong P, Tengbriacheu C, Sisavanh M, Khattiyod T, Asai D. A regulatory gap analysis of midwifery to deliver essential reproductive, maternal, newborn, child and adolescent health services in Lao People's Democratic Republic. Lancet Reg Health West Pac. 2024;43:.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Leta M, Tura AK, Mezmur H, Shiferaw K, Assefa N. Adverse maternal outcomes among women who gave birth at public hospitals in eastern Ethiopia: a cross-sectional study. Front Glob Womens Health. 2025;6:1569815.

Li Y, Spetz J, Cimiotti JP. Pathways to economic growth for nursing and midwifery workforce: a research agenda. Nurs Econ. 2021;39(6):265-284.

Lopez Ramirez E, Sifuentes Valenzuela MC, Rodriguez RL, Aguilar SL, Perea Gonzalez GP. Service quality evaluation in the undergraduate stomatology degree at BUAP: SERVPERF and Donabedian methodologies. Entreciencias. 2021;9(23):.

Luo C, Li Q, Gao R, Zhang Y, Wang Y, Huang F, Zheng X, Zhang X, Liu W. Association between serum lipid traits and cognitive function in middle-aged and elderly adults: a longitudinal study. Curr Alzheimer Res. 2025;.

Marc A, Poulin M, Ahmad K, Ali A. CO2 emissions, globalization, and health: A dynamic panel analysis of life expectancy in BRICS. Environ Dev Sustain. 2025;:1-33.

Marc A, Roussel Y. Exploring the link between public health and external debt in Saudi Arabia. J Bus Econ Options. 2024;7(4):1-12.

Maxwell JA. Interactive approaches to qualitative research design. In: The SAGE handbook of qualitative research design. Thousand Oaks (CA): SAGE; 2022. p. 41-54.

Mehdi MA. Examining the dynamics of infant mortality rates: A time series analysis. J Policy Options. 2019;2(2):52-63.

Modibbo H, Inuwa N. Health outcomes and economic growth nexus: Evidence from Nigeria. J Bus Econ Options. 2020;3(2):46-55.

Modupe E. Mobbing and its effects on employee commitment in the workplace. J Policy Options. 2021;4(3):18-26.

Mohammed HH, Hamed AAAE, Afefy NAEF, Sherif NA, Ibrahim SM. The effectiveness of nurse-led antenatal education on maternal self-efficacy: an evidence-based approach. BMC Nurs. 2025;24(1):895.

Muhammad A, Yan W. An overview about the challenges of urban expansion on environmental health in Pakistan. J Energy Environ Policy Options. 2019;2(3):64-71.

Naz S, Amin H, Sayed A. Maternal mortality in Pakistan: the potential role of community midwives. J Dev Soc Sci. 2024;5(2):45-52.

Nove A, Boyce M, Neal S, Homer CSE, Lavender T, Matthews Z, Downe S. Increasing the number of midwives is necessary but not sufficient: using global data to support the case for investment in both midwife availability and the enabling work environment in low-and middle-income countries. Hum Resour Health. 2024;22(1):54.

Nove A, Friberg IK, De Bernis L, McConville F, Moran AC, Najjemba M, Ten Hoope-Bender P, Tracy S, Homer CSE. Potential impact of midwives in preventing and reducing maternal and neonatal mortality and stillbirths: a Lives Saved Tool modelling study. Lancet Glob Health. 2021;9(1):e24-e32.

Pennington CG. Concepts and issues in public health culture, psychology, and the ecological approach. J Educ Stud Multidiscip Approaches. 2022;2(1):.

Quader M. Exploring human resource management practices and employee satisfaction in Bangladesh's private banking sector. J Policy Options. 2024;7(1):36-45.

Radovich E. Complex reality, implementation and measurement: evaluation of an electronic decision support system to improve antenatal care quality in South Asia [thesis]. London: London School of Hygiene & Tropical Medicine; 2024.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Raja U, Iqbal N. Ensuring worker safety in Lahore's large industries: A study on occupational health, safety, and risk management. J Energy Environ Policy Options. 2019;2(4):117-124.

Rehman AU, Malik S. Environmental and health hazards of Pakistan's leather industry. J Energy Environ Policy Options. 2020;3(3):96-103.

Rojas-Suarez J, Paruk F. Maternal high-care and intensive care units in low-and middle-income countries. Best Pract Res Clin Obstet Gynaecol. 2024;93:102474.

Ruhdiat R, Wardani DS, Sihite H, Montolalu IA, Tyarini IA. Improving maternal and infant outcomes through enhanced midwifery practices. J Acad Sci. 2024;1(6):843-849.

Russo L. The impact of slow productivity on healthcare costs in a no-growth: An empirical analysis. J Policy Options. 2022;5(4):22-28.

Saha S, Laisram N. AOCNR ePoster abstract. 2022.

Say L, Chou D, Gemmill A, Tuncalp O, Moller AB, Daniels J, Gulmezoglu AM, Temmerman M, Alkema L. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;.

Solar O, Irwin A, Solar O. Structural and social determinants of health. 2024.

Souza JP, Day LT, Rezende-Gomes AC, Zhang J, Mori R, Baguiya A, Jayaratne K, Osoti A, Vogel JP, Campbell O. Maternal health in the perinatal period and beyond: a global analysis of the determinants of maternal health and transitions in maternal mortality. Contraception. 2023;11:12.

Ufaq A. Analyzing the impact of government expenditure on the health sector: Evidence from Pakistan. J Bus Econ Options. 2019;2(2):54-66.

Vaivada T, Lassi ZS, Irfan O, Salam RA, Das JK, Oh C, Carducci B, Jain RP, Als D, Sharma N, et al. What can work and how? An overview of evidence-based interventions and delivery strategies to support health and human development from before conception to 20 years. Lancet. 2022;399(10337):1810-1829.

Vamos CA, Foti TR, Reyes Martinez E, Pointer Z, Detman LA, Sappenfield WM. Identification of clinician training techniques as an implementation strategy to improve maternal health: a scoping review. Int J Environ Res Public Health. 2023;20(11):6003.

Weiland S, Hickmann T, Lederer M, Schwindenhammer S. The 2030 agenda for sustainable development: transformative change through the sustainable development goals? In: Cogitatio Press. 2021. p. 90-95.

Werdofa HM, Thoresen L, Lulseged B, Lindahl AK. 'I believe respect means providing necessary treatment on time'-a qualitative study of health care providers' perspectives on disrespect and abuse during childbirth in Southwest Ethiopia. BMC Pregnancy Childbirth. 2023;23(1):257.

Williams CR, Adnet G, Gallos ID, Coomarasamy A, Gulmezoglu AM, Islam MA, Rushwan S, Widmer M, Althabe F, Oladapo OT. Research agenda for ending preventable maternal deaths from postpartum haemorrhage: a WHO research prioritisation exercise. BMJ Glob Health. 2024;9(11):e015342.

Wojcieszek AM, Bonet M, Portela A, Althabe F, Bahl R, Chowdhary N, Dua T, Edmond K, Gupta S, Rogers LM, et al. WHO recommendations on maternal and newborn care for a positive postnatal experience: strengthening the maternal and newborn care continuum. BMJ Glob Health. 2023;8(Suppl 2):e010992.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

World Health Organization. Minimum technical standards and recommendations for reproductive, maternal, newborn and child health care for emergency medical teams. Geneva: World Health Organization; 2021.

World Health Organization. Report of the eighth meeting of the WHO Strategic and Technical Advisory Group of Experts for Maternal, Newborn, Child and Adolescent Health and Nutrition, 14-16 November 2023. Geneva: World Health Organization; 2024.

World Health Organization. Transitioning the midwifery models of care: global position paper. Geneva: World Health Organization; 2024.

World Health Organization. Trends in maternal mortality 2000 to 2020: estimates by WHO, UNICEF, UNFPA, World Bank Group and UNDESA/Population Division. Geneva: World Health Organization; 2023.

World Health Organization. WHO antenatal care recommendations for a positive pregnancy experience: maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy. Geneva: World Health Organization; 2022.

World Health Organization. WHO antenatal care recommendations for a positive pregnancy experience: maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy. Geneva: World Health Organization; 2023.

World Health Organization. Working for health 2022-2030 action plan. Geneva: World Health Organization; 2022.

Yinusa D, Ogoun J. Exploring communication practices as drivers of employee loyalty and engagement. J Policy Options. 2024;7(3):1-11.

Yoshida T, Kido J, Ogata M, Watanabe S, Nishi N, Shimomura S, Hirai N, Tanaka K, Yanai M, Mizukami T. Safety of oral food challenges for individuals with low levels of cow's milk-specific immunoglobulin E antibodies. Int Arch Allergy Immunol. 2025;186(6):543-550.