A COMPREHENSIVE ANALYSIS OF MATERNAL AND REPRODUCTIVE HEALTH CHALLENGES IN PAKISTAN: A SYSTEMATIC REVIEW

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Background: Significant challenges regarding maternal and reproductive health persist in Pakistan, with the country facing substantial obstacles in accessing and utilizing services associated with reproductive, maternal, neonatal and child health (RMNCH). Despite various initiatives, Pakistan continues to grapple with an alarming maternal mortality rate due to biological, socioeconomic, cultural factors, as well as inadequate sexual and reproductive health (SRH) services. **Objective:** This analysis aims to address the existing gaps in research and provide actionable recommendations for policy and practice. **Methods:** A compr-ehensive analysis adhered to Preferred Reporting Items for Systematic Reviews and MetaAnalyses (PRISMA) guidelines was conducted, encompassing peerreviewed journals and grey literature published between 2010 and 2024. The review focused on studies in English on maternal and reproductive health topics, sourced from databases including PubMed, Google scholar, Web of Science, Embase, Cochrane and MeSH terms. A total of 20 original, peerassessed studies, comprising quantitative and qualitative research, were reviewed. **Results:** This systematic review synthesizes findings from 20 major studies on maternal and reproductive health issues in Pakistan. This review is qualitative in nature. Qualitative design were predominant comprising 35% (n= 7) of studies whereas quantitative approaches accounted for 10% (n=2). Crosssectional surveys constituted 20% (n=4) of the studies, mixed-methods 15% (n=3), and other methodologies 20%. Most notably, no case-control or cohort studies were included. All studies were conducted in Pakistan focusing on maternal and reproductive health challenges such as maternal and child mortality, antenatal care, delivery, postnatal care, obstetric care barriers and sociocultural factors. Of the studies, 70% (n=14) assessed maternal and reproductive health issues in Pakistan, while 30% (n=6) examined obstetric care barriers. Study populations included females of reproductive age, pregnant women, and postnatal women. Additionally, 60% (n=12) of studies focused on maternal and child mortality rates and 40% (n=8) addressed reproductive, maternal, newborn, and child health (RMNCH). **Conclusion:** This systematic review sheds light on a multifaceted landscape characterized by high maternal, fetal, and child mortality rates and persistent reproductive health issues in resource-limited countries like Pakistan. It highlights the impacts of educational gaps, socioeconomic status, cultural norms, political instability and systemic constraints that further complicate healthcare delivery.

INTRODUCTION

Maternal and Reproductive health has been a pressing issue in Pakistan, characterized by substantial obstacles in assessing and utilizing services associated with the health of reproductive, maternal, neonatal, and child (RMNCH) population. There has been a notable focus on addressing obstacles pertaining to maternal and reproductive health over the last few decades[1].

Recognizing the pivotal role that woman's reproductive health plays in their overall wellbeing [2]. Reproductive health emphasizes holistic wellbeing, involving the physical, emotional, cognitive, and societal aspects of reproduction, rather than merely the lack of disease, dysfunction, or incapacity [3].

As the fifth most populous country in South Asia

[4], Pakistan, which also defined as a lower middle income country [5] and was ranked 154 of 195 countries worldwide in terms of healthcare access and quality according to the World Bank [6]. Maternal mortality is emerging as a prevalent factor contributing to death toll among the women in their reproductive age. MMR are notably higher in resource limited nations attributed to factors such as excessive fertility rates, inadequate medical facilities, high widespread infectious diseases, and limited access to quality healthcare [7] Among South Asian nation, Pakistan is recognized for its high maternal mortality rates [8]. Every year, approximately 420,300 deaths occur among children below five years [9], while 8,300 deaths resulting from maternal mortality annually in the nation [10].

Pakistan continues to struggle in achieving its set goals, facing persistent challenges such as a shortage of trained workforce, improper infrastructure, educational limitations and societal restrictions, all of these factors pose major roadblocks in improving Pakistan's healthcare system and reducing the maternal mortality rate [11]. Achieving MDGs 4 and 5 in Pakistan has been a slow process and the targets were not reached [12]. Globally, the healthcare system faced unprecedented challenges in providing care for COVID-19 [1]. Nearly, 1.5 million people have been affected by the pandemic in Pakistan, with over 30,000 reported deaths [13]. The impact of COVID-19 on healthcare system in Pakistan included insufficiency of beds, medications and oxygen cylinders, alongside incidents targeting healthcare workers [14]. The pandemic indirect consequences on the health of reproductive, maternal, neonatal and child (RMNCH) population could be even more substantial. Other frequently cited challenges includes the substandard education of healthcare professionals, limited awareness of available healthcare options, scarcity of top notch healthcare services, prevalent cultural norms and societal reproach, service expenses, inadequate readiness for childbirth, substantial distances to healthcare facilities, limited public transit options, constrained household finances, and concern about societal stigma, especially

notable in underdeveloped nations [15].

Sexual and reproductive health (SRH) services continue to be inaccessible in numerous lower- and middle income countries (LMICs) and philanthropic settings are still constrained, especially among young population. Ineffective provision of SRH services has been attributed to gender-targeted violence, the rise in cases of HIV and sexually transmitted infections (STIs), unexpected pregnancies and complications rela-ed to high risk abortions [16]. Globally, health systems continues to prioritize providing inclusive, evidence driven and economically viable maternal health services to mitigate maternal and child mortality [17].

A key aspect of ensuring women's access to healthcare is to equip them with adequate information regarding their maternal health rights and accessible facilities [18]. The purpose of this systematic review is to scrutinize maternal, reproductive health interventions in resourceconstrained nation like Pakistan complying with the Preferred Reporting Items for Systematic Reviews, and MetaAnalysis (PRIS-MA) protocols yield valuable insights into the challe-nges of addressing these issues. These reviews offer a comprehensive analysis of existing evidence, synthesis of intervention and determinants affecting implementation in resourcelimited setting like Pakistan [19],[20].

MATERIALS AND METHODS

Search strategy: This systematic review conformed to the Preferred Reporting Items for Systematic Reviews and MetaAnalysis (PRISMA) guidelines and established rigorous criteria for conducting systematic reviews. Our search strategy involved an extensive exploration of relevant literature. We conducted comprehensive searches across multiple databases including PubMed, Web of Science, Embase, Cochrane and the reproductive health gateway utilizing MeSH terms to enhance specificity. Additionally, we manually searched reference lists and grey literature. Keywords searches were conducted using Google and Google Scholar search

engines to ensure exclusivity.

Selection criteria: The search strategy was tailored to encompass country/setting specifics, intervention or education related terms and SRH terms. SRH was defined according to standard outlined in the International Conference on Population Development (1994) and SRH strategies and guidance provided by the World Health Organization's (WHO) in 2010. Collaboratively generated by the authors in consultation with a WHO librarian, the search terms spanned various dimensions including, obstetric care, birth control, adolescent sexual development, induced miscarriage, genderspecific violence, general sexual and reproductive wellbeing, regulation of family size, STIs, fetal health monitoring, HIV/AIDS, maternal and infant health, conception, and prevention of mother-to-child transmission (PMTCT). Furthermore, the search utilized the following terms to "maternal health," "reproductive health," "neonatal health," "child health," "health interventions," "social determinants," "maternal mortality," "antenatal care," and "community health." Additionally, it sought to locate relevant articles focusing on 'maternal and reproductive health' along with the additional concepts of 'access', 'barriers' 'developing countries' and 'Pakistan'. Relevant existing evidence syntheses, systematic reviews, and literature reviews were also conducted to identify further relevant literature.

Inclusion criteria: Articles that met the inclusion criteria were:
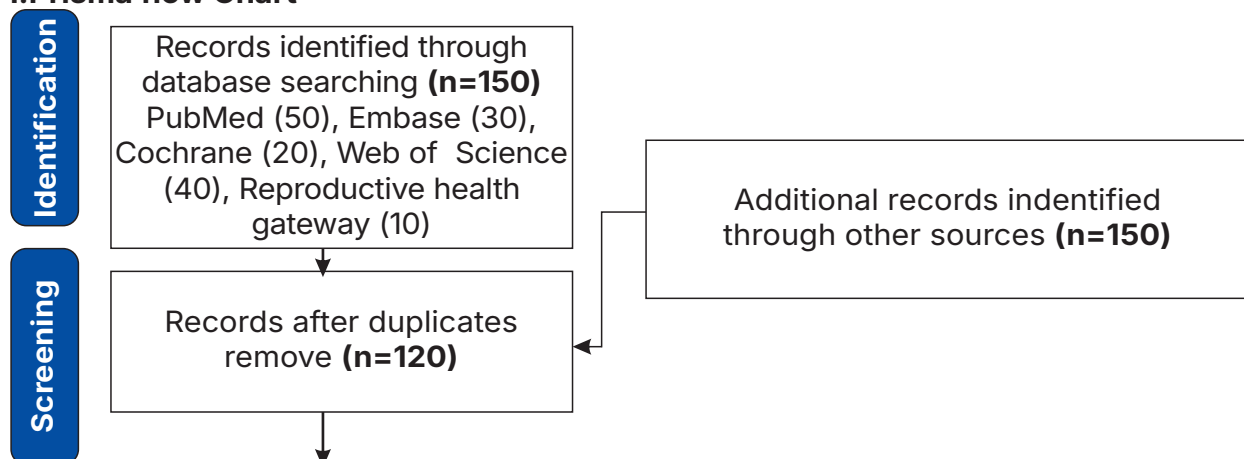**1.** Articles published between 2010 and 2024 to encompass the latest development in the field.
2. Studies utilizing qualitative, quantitative, cross-sectional, descriptive, longitudinal, or mixed-methods designs were consi-dered for inclusion.
3. Literature written in English, published in scholarly and journals subjected to peer review, and conducted within the geographical areas of Pakistan were considered.
4. Studies using primary data , secondary data, and conceptual frameworks based on literature reviews.
5. Studies addressing maternal and reproductive health challenges such as maternal and child mortality, antenatal care, delivery, postnatal care, maternal, fetal, and neonatal outcomes, barriers to obstetric care and socio-cultural factors.
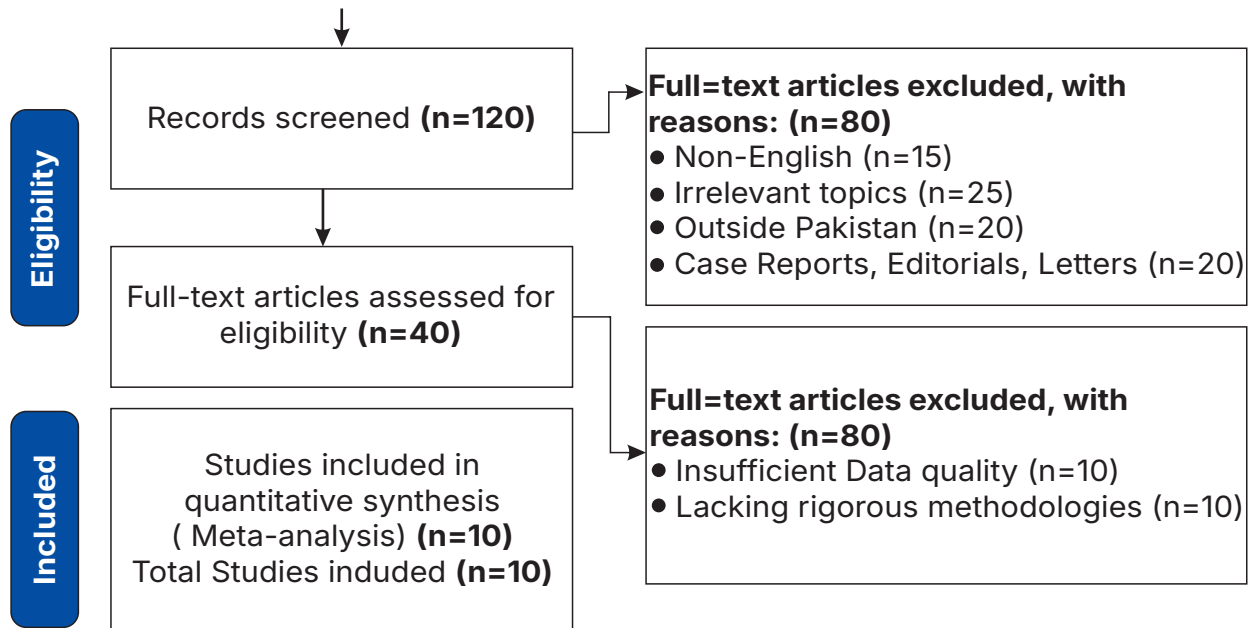
Exclusion criteria:
Articles that met the exclusion criteria were:
1. Case reports, editorials and letters were excluded to prioritize highquality research.
2. Studies conducted outside Pakistan and those not published in English were excluded to maintain consistency and accessibility for data extraction and analysis.
3. Studies that do not address maternal and reproductive health challenges and or focus on unrelated health issues were excluded.
4. Studies with insufficient data quality or lacking rigorous methodologies were excluded.

Fig-1:Prisma flow Chart

PRISMA flow chart:

Identification
Records identified through database searching **(n=150)** PubMed (50), Embase (30), Cochrane (20), Web of Science (40), Reproductive health gateway (10)

Additional records indentified through other sources **(n=150)**

Screening
Records after duplicates remove **(n=120)**

RECULTS

Mahmood (2010) conducted a seminal study evaluates the impact of the PAIMAN project across ten districts in Pakistan. By comparing baseline and endline household survey findings, the authors offer a comprehensive assessment of project effectiveness in improving maternal and neonatal health indicators. A group led by the Population Council launched the Pakistan Initiative for Mothers and Newborns (PAIMAN), seeks to assist the Pakistani government in enhancing obstetric and newborn care in ten specific areas. PAIMAN formulated specific interventions with the aim of enhancing the coordination and administration of services at all levels. These initiatives were undertaken to expand the accessibility of maternal and child healthcare, elevate the standards of services in both governmental and private domains to address infant and pregnancy related issues, and enhance the expertise of health services administrators and practitioners in realm of maternal and neonatal health. According to this final report, PAIMAN improved the key performance indicators for mother and newborn health. The most evident advancements revolve around enhancement in trained delivery assistance and reductions in infant and fetal death rates. The primary goal is to expand the implementation of interventions that produced the most significant impacts on maternal and infant metrics. Additionally, it establishes the sustainable infrastructure that ensures mothers and infants all over the country can experience the positive outcomes achieved through the success of the PAIMAN project (21). One study contributing significantly to this discourse is the work by Hou and Ma (2011) titled "Empowering Women: The Effect of Women's Decision-Making Power on Reproductive Health Services Uptak Evidence from Pakistan." Numerous studies have sought to investigate the relationships connections and within the independence of female community and their usage of pregnancy related medical care within South Asian domain.

However, the results thus far have presented conflicting results. The Pakistan Social and Living Standards Measurement Survey were used in this study to evaluate how household decision-making affects how often women seek reproductive health care. After taking into account socioeconomic indicators and supplyside factors, the study concludes that female's leadership in determining outcomes strongly aligned with the proactive and beneficial utilization of reproductive health care, while powerful men's

decision-making power has the reverse effect. The findings suggest that empowering women with greater control and decision-making power could boost their engagement with reproductive health care. Additionally, this research proposes that Pakistani initiatives geared towards encouraging the involvement of both men and women to ensure that women can access maternal health services effectively (22).

Nyamtema et al., (2011) cond-ucted a systematic review to analyze the effects of interventions on maternal health and identify influencing factors. This review, guided by the PRISMA guidelines, aimed to provide insights into addressing maternal health challenges in resourceconstrained settings. From an initial pool of 5084 papers, 58 studies met the requirements for a systematic review. Notably, programs that combined multiple interventions showed a higher potential for significant positive maternal outcomes. Key interventions reviewed were, training in emergency obstetric care (EmOC), deployment of competent care providers, infrastructure refurbishment, and improving obstetric care supply chains. The findings highlighted the significant reductions in maternal mortality ratios and case fatality rates that were noted in 55% and 40% of the studied programs, respectively. Furthermore, there was a notable increase in births in EmOC facilities, and the rate of cesarean section in 71% to 75% of the programs that used these metrics.

However highlighted challenges involve implementing evidencebased interventions in resourceconstrained nations including insufficient national resources, a lack of leadership skills, and user barriers. In conclusion, Nyamtema et al., (2011) study provides a comprehensive overview of evidencebased intervention packages for maternal health in resourcelimited settings, emphasizing their demonstrated impacts and the factors influencing their effectiveness. The review calls for collaborative efforts to translate these findings into actionable measures and accelerate progress toward improving maternal health outcomes in resourcelimited settings (19). Bhutta et al., (2013) provide a comp-

rehensive analysis of Pakistan's reproductive, maternity, neonatal, and child health (RMNCH) environment, revealing both considerable difficulties and potential for addressing these challenges. The study highlights Pakistan's struggle with high maternal, fetal, and child death rates, which rank third globally in this burden. Despite efforts, progress toward Millennium Development Goals (MD-Gs) 4 and 5 has been modest, hindered by socioeconomic determinants such as poor education and nutrition, particularly among girls. The analysis underlines the complexities of political ins-tability, security concerns, and natural disasters, all of which affect healthcare delivery in the country. The authors critically evaluate existing public sector programs and the consequences of devolution, advocating for communitybased strategies to improve coverage of evidence-based interventions. The study simulates the potential impact of scaling up these interventions, projecting significant decreases in death rates if successfully implemented, and offering a route to improved RMNCH outcomes in Pakistan (23). Mumtaz et al., (2014) conducted a study on "Improving Maternal Health in Pakistan: Toward a Deeper Understanding of the Social Determinants of Poor Women's Access to Maternal Health Services."

Findings suggest that interventions implemented nationally and locally do not effectively reach Pakistani women situated on the fringes of financial and societal strata. Researchers conducted a tenmonth qualitative study within a community in Punjab, Pakistan. (May 2010 February 2011). The data was collected by using 94 comprehensive surveys, 11 group discussions focused on specific topics, 134 sessions based on observation and almost 5 case studies related to maternal mortality. Because of poverty and their reliance on highercaste, wealthier people for loans or monetary transfers, women were unable to access the care they required while being aware of delivery issues and the available therapies. It is time for Pakistani health care policy to stop ignoring lowcaste groups. To prevent social and economic marginalization and enhance the

accomplishment of Millennium Development Goal MDG 5 in Pakistan, technical breakthroughs in maternity healthcare services must be encouraged (24). Pasha et al., (2015) conducted a study titled "Maternal and newborn outcomes in Pakistan compared to other low and middle income countries in the Global Network's Maternal Newborn Health Registry" provides invaluable insi-ghts and highlighting both successes and challenges within the context of LMICs. Key findings of the study are the discrepancy in mate-rnal and newborn health outcomes. The maternal mortality ratio at the Pakistan location was almost three times higher than at the other sites. Neonatal mortality rate (50.0 per 1000 live births compared to 20.7), perinatal mortality (95.2 per 1000 births compared to 39.0), and miscarriage (56.5 vs 22.9/1000 births) rates were higher in Thatta, Pakistan compared to in the other regions. Pakistan ranks lower than other areas in terms of parental health training, increased fertility and sufficient beforebirth and post-delivery support. Rates of professional childbirth assistance and facility deliveries, apart from India, did not show significant differences among the Pakistani site and the other locations. The biggest disparity between prenatal and infant outcomes between the locations of Pakistan and others. Infants of average birth weight showed the significant difference.

Even though the delivery care in Pakistan appears to be numerically similar to that in places in Africa, the effectiveness in preserving the lives of expectant mothers and their newborns is notably lower in Pakistan. The findings from this study depicts that the standards of obstetrical and infant care in Pakistan does not meet the necessary criteria (25). Memonetal., (2016) shed light on the continuing barriers to the utilization of maternity and child health (MCH) services in rural Pakistan, hence inhibiting the achievement of Millennium Development Goals 4 and 5. Through qualitative methods, the research explores the multifaceted constraints faced by communities in ten remote locations of Pakistan. The findings highlight a number of reasons that contribute to poor utilization rates, including limited aware-

ness, geographical remoteness, financial const-raints, and inadequate service supply. Notably, while cultural and religious restrictions emerge as minor impediments, the overall theme is the existence of strong barriers to getting necessary MCH services.

The study examines barriers across different maternal and child health (MCH) services, revea-ling low community awareness for preventive services like antenatal care, postnatal care (PNC), childhood immunization and family planning, the predominant barrier identified is low awareness among community members. Furthermore, the study investigates the impact of Community Health Workers (CHWs) on reducing client barr-iers, with conflicting results. While clients residing in areas served by CHWs are more aware of ANC and family planning services, other essential MCH services receive insufficient attention under the current health worker program. The study suggests a holistic approach to address poor maternal and child health service utilization in rural areas, focusing on community awareness, task shifting, and rejuvenating the CHW program. It also emphasizes the need for catalytic support to enhance transportation networks and optimize healthcare center functionality (26). Nisar et al., (2016) conducted a qualitative study to evaluate the factors that promote and impede the use of antenatal care services among pregnant women in Pakistan, with a focus on urban Islamabad and rural Swabi. Despite the WHO's guideline of at least four ANC visits, only 37% of Pakistani women meet this requirement. The study identified several key facilitators through interviews and focus group discussions with pregnant women, healthcare providers, and community health workers, including trust in healthcare providers, social recommendations, the availability of quality serv-ices and medical equipment, affordability, and accessibility. Significant barriers include financial difficulties, the perceived absence of health issues, logistical challenges, familial limit-ations, household workload, a lack of ANC awar-eness, and perceived service unavailability were all significant impediments. These findings high-

light the critical need for comprehensive policy measures to overcome these barriers and promote increased ANC attendance, eventually improving maternal and reproductive health outcomes in Pakistan (27). Firoz et al., (2018) explored a study on "A framework for healthcare interventions to address maternal morbidity".

There is a shift in the focus of maternal health agenda from solely reducing maternal fatalities to enhancing the health and wellness of women. An essential aspect of this evolution involves addressing maternal mortality alongside the rising prevalence of chronic and noncommunicable diseases (NCDs) among expectant mothers. The framework underscores the importance of early detection and treatment of maternal morbidities, often overlooked in traditional healthcare settings. A priority for the WHO is to strengthen the scientific foundations of maternal morbidity definition, assessment, and monitoring, as established by the Maternal Morbidity Working Group (MMWG). We recommend promoting greater coordination among maternal care and NCD programs, provide models for framing maternal health, and associated interventions based on the work of the MMWG. Considering the connections among chronic illnesses, maternal mortality and enduring well-being, this integration may have a positive synergistic effect. Pregnancy offers substantial opportunities for women who might otherwise not pursue or receive treatment for chronic illnesses and should be viewed as a gateway to both current and future women's health. Instead of only providing emergency obstetric care, maternal health services should concentrate on a more comprehensive approach that includes early identification, preventive interventions, and integration with additional services. Healthcare systems must give resources for creating integrated health programmes and supporting the personnel top priority in order to respond. Due to the MMWG's activities, people are now more aware of how the maternal health landscape is changing and the necessity of expanding maternal health's narrow focus in order to move beyond merely surviving to thriving (28).

Aziz et al., (2020) conducted a comparative analysis of pregnancy outcomes across several lower and middle-income countries, shedding light on the significant disparities observed in maternal and newborn health indicators. The study utilizing the data from the Global Network Maternal Newborn Health Registry (MNHR), underscores the magnitude of the issue. Over the period of 2010 to 2018, Pakistan reported 91,076 births revealing distressingly high maternal mortality ratios (MMR), neonatal mortality ratios (NMR) and stillbirth rates. For instance, the MMR in Pakistan soared to 319 per 100,000 live births, markedly surpassing the average of 124 in other regions. Similarly, the NMR and stillbirth rates in Pakistan were 49.4 per 1,000 live births and 53.5 per 1,000 births, respectively, far exceeding the corresponding rates in other study areas. Furthermore, the study reveals that Pakistan has not just greater rates of preterm births and low birth weight, but also insufficient medical treatment for pregnant women and newborns. This care gap is particularly noticeable when compared to the combined average of other Global Network sites. The study attributed worse pregnancy outcomes in Pakistan to a variety of variables. Reproductiveaged women in Pakistan are disproportionately affected by low educational attainment, undernourishment, and anemia, all of which lead to poor pregnancy outcomes. Furthermore, the prevalence of preterm and low-birthweight newborns exacerbates the situation, compounded by suboptimal maternal and newborn healthcare facilities. In the light of these findings, the study emphasizes the urgent need for targeted interventions to enhance maternal and reproductive health outcomes in Pakistan. Addressing issues such as poor education, malnutrition, and inadequate healthcare infrastructure offers the potential for significant improvements in pregnancy outcomes across the country. By prioritizing these areas, Pakistan can make great progress toward reducing the staggering burden of poor maternal and newborn health outcomes (29). Mustafa et al., (2020) conducted a study on "Patriarchy, Maternal Health and Spiritual Healing: Designing Maternal Health Interventions in Pakistan." The study conducted

over a period of sixmonths provides a qualitative exploration of prevalent attitudes and behaviors surrounding maternal health in Pakistan. It sheds light on the multifaceted challenges that women experience when seeking healthcare, which are affected by deeply rooted religious beliefs and home power dynamics. Furthermore, it emphasizes the prevalence of misinformation among both mothers and healthcare worker, worsening an already dangerous scenario. Pakistan is facing a profound maternal health crisis, as characterized by a sharp contrast between its maternal mortality rate of 178 deaths per 100,000 live births and the substantially lower average of affluent countries, which is only 12 deaths per 100,000. In light of the study findings, the literature review emphasizes the critical need for innovative strategies targeted to the specific demands and challenges that women faced in Pakistan. It advocates for actions that not only provide access to healthcare but also enable women to make informed decisions about their own health. Moreover, it emphasizes the significance of working with religious leaders and communities to ensure that maternal health initiatives are culturally appropriate and inclusive. The study insights to the maternal healthcare debate by shedding light on the pervasive influence of patriarchy, religious beliefs, and misinformation on maternal health outcomes in Pakistan. Their findings serve as a poignant reminder of the need of creating interventions that are contextually appropriate, culturally sensitive, and empowering for women in their pursuit of maternal wellbeing (30). Omer et al., (2021) aimed to address this gap by investigating the sociocultural factors contributing to delays in accessing maternity healthcare in the southern region of Punjab, Pakistan. Maternity mortality remains a major issue in many developing countries, including Pakistan, where societal and cultural barriers frequently impede access to effective maternity healthcare. Despite extensive research on maternal mortality in developing countries, there remains a significant gap in understanding how sociocultural factors contribute to delays in seeking maternal care within the framework of Three Delays Model. The findings highlighted various sociocultural barriers that contribute to delays in obtaining prenatal care and consequent maternal mortality. Rural people faced difficulties such as poor socioeconomic status, limited maternity healthcare knowledge, and economic constraints. Furthermore, gender inequities and male dominance were highlighted as important barriers to women's empowerment and decision-making abilities regarding seeking healthcare. Traditional practices such as preferring traditional birth attendants, early marriages, and a lack of family planning increased maternal health issues, which were reinforced by cultural values, religious beliefs, and customs. Poverty reduction, women's empowerment, and increasing their decision making authority in healthcare access should be prioritized. Furthermore, interventions should aim to challenge and modify detrimental cultural norms and traditional practices, thereby increasing the use of maternal healthcare services and, ultimately, improving maternal health outcomes. There is an urgent need for comprehensive interventions to address these issues and ensure women's right to proper maternal healthcare (31). Malik et al., (2021) conducted a qualitative study aimed at assessing women's experiences, perceptions, and expectations about the use and delivery of maternal healthcare services in Pakistan. The study utilized a snowball sampling technique and included both pre- and post-partum women as participants, eventually reaching saturation with nine participants in each group. The researchers used thematic analysis to identify various themes and subthemes, including birth experience, maternal treatment pathway, impediments to excellent maternity care, involvement in healthcare decision-making, and the impact of external facors such as Covid-19, among others. One of the study's significant findings was the low quality of maternal care services in Pakistan. Concerns were raised about the high prevalence of caesarian sections and the lack of women's involvement in decision-making was identified as an area need urgent attention. Furthermore, the study emphasized the financial burden associated with maternal care, demonstrating that the expenditures were frequently prohibitive for

many women. This study provides valuable insights into the challenges that women face when accessing and using maternity healthcare services in Pakistan. Addressing these challenges will require comprehensive reforms aimed at improving the quality, accessibility and affordability of maternal care services in the country (32). The study conducted by Shaeen et al., (2022) delves into the critical issues of maternal mortality in Pakistan, highlighting the country's numerous challenges in this domain. The research points out a significant shortfall in achieving targets. Despite a modest decrease in maternal death rates, Pakistan's improvement is insufficient to reach its health targets. The survey identifies several key challenges, including a shortage of competent healthcare personnel and inadequate infrastructure, particularly in rural areas. This is exacerbated by poor education about maternal healthcare and widespread social limitations that impede effective healthcare delivery. The study focuses on the discrepancy in healthcare accessibility between urban and rural areas of Pakistan. Poverty, poor healthcare infrastructure, and a general lack of knowledge and education about maternal health present heightened challenges in rural areas. These factors collectively contribute to the persistently high maternal death rates in these areas. Shaeen advocate for robust government and international intervention to address these concerns. Their recommendations include obtaining international funds to improve healthcare facilities, particularly in underserved rural areas, as well as implementing extensive training programs for healthcare staff. The study also emphasizes the necessity for public health education campaigns to promote the value of prenatal and delivery care. Moreover, the authors stress the importance of ongoing research to evaluate the effectiveness of various health initiatives and ensure continuous improvement in maternal health services. This multimodal strategy is critical to reducing maternal mortality and enhancing reproductive health in Pakistan (11). Maternal mortality is a significant public health concern in Pakistan, matching trends seen in many developing countries. The intricate inter-

plays of social and cultural factors that systemically limit women's access to essential maternal healthcare treatments are at the heart of the crisis's persistence. Despite the critical relevance of understanding and addressing these variables, scholarly attention has been disproportionately limited. Against this context, Naz et al. (2022) conducted a key study on the social and cultural dimensions of maternal mortality in Khyber Pakhtunkhwa, Pakistan, using the Three Delayed Model Approach as a conceptual framework. Naz et al. used a qualitative research design that included key informant interviews, focus group discussions, and case studies to carefully untangle the complex web of factors leading to maternal death in the study region. Their findings highlighted the serious consequences of healthcare access delays, which are inextricably linked to various social and cultural determinants. Notably, the study illuminated the detrimental effects of women's low social status, weak nutritional status, and widespread lack of awareness of maternal healthcare practices. Furthermore, ingrained societal norms such as limited mobility, reduced decision-making autonomy in healthcare and family planning, reliance on traditional birth attendants, and prevalent early marriages were revealed as significant hurdles to reducing maternal death rates. The study emphasizes the urgent need for targeted interventions aimed at enhancing women's socioeconomic status and empowering them in healthcare and family planning decisions, emphasizing the importance of governmental and non-governmental initiatives in addressing maternal mortality. By prioritizing interventions that foster women's agency and socioeconomic empowerment, policymakers and stakeholders can meaningfully contribute to mitigating maternal mortality rates and advancing maternal and reproductive health outcomes in Pakistan (33). Emmanuel et al., (2022) conducted a comprehensive study analyzing the significant indirect impacts of the COVID-19 pandemic on RMNCH services in Pakistan. The analysis found that the enforcement of lockdowns and containment measures starting in March 2020 resulted in a significant reduction in the use of RMNCH serv-

ices during the first and second waves of the pandemic. The study, which spans three distinct periods—the first wave, a period of declining cases, and the second wave of COVID-19 in 2020—uses routine monitoring data to examine service consumption changes. The findings are profound, with an 82% reduction in pneumonia treatment for children under five, a 57% reduction in caesarean sections, and a 37% decline in institutional deliveries and first postnatal visits during the pandemic's peak periods. These declines show the pandemic's severe impact on essential health services, compounding already existing vulnerabilities in the healthcare system. Although there was a temporary recovery in service utilization between June and September, the second wave resulted in another major reduction. These findings emphasize the urgent need for policies to maintain the continuity of essential RMNCH services during current and future public health emergencies. The authors advocate for prioritizing family planning, immunization campaigns, and routine mother and child health care to avoid catastrophic health outcomes (34). The study by Midhet et al., (2023) investigates the factors affecting the utilization of these services in Pakistan, using data from the 2019 Pakistan Maternal Mortality Survey. The authors used binary logistic regression to investigate how variables such as education, affluence, parity, and residence affect use of maternal health service. The findings revealed a significant positive connection between wealth and the use of both IANC and SBA. Women from higherincome households were substantially more likely to receive all necessary prenatal services and skilled birth attendance (AOR = 11.48 for IANC and 4.37 for SBA). Furthermore, maternal age was a significant predictor of IANC, especially among women aged 35 and above (AOR = 1.31). Education was another important factor, with women who had received formal education being more likely to use maternal health services. Parity also had an impact on service utilization, with women who had 3-5 previous live births being the most likely to use IANC and SBA. Contrary to predictions, urban residency did not show a substantial link with the

use of these services, indicating that other underlying factors are at play. The study concludes that women in lower income quintiles and without formal education are less likely to access critical maternal health care. To overcome these gaps, the authors propose a multifaceted approach including both the health and education sectors. This strategy aims to increase maternal health service accessibility and awareness, ultimately improving overall maternal health in Pakistan (35). Iqbal et al., (2023) present a comprehensive examination of maternal and newborn PNC utilization trends in Pakistan from 2006-2018.Their research emphasizes the importance of PNC in protecting maternal and newborn health by early detection of issues after birth. The researchers used secondary data from the three waves of Pakistan Demographic and Health Surveys (PDHSs) and conducted bivariate and multivariate logistic regression analyses to identify relationships between PNC use and several factors at the individual, community, and institutional levels. Their findings show a significant rise in maternal PNC utilization, from 43.5% in 2006 to 63.6% in 2018. In contrast, newborn PNC usage followed a nonlinear trend, rising at 50.5% in 2013 and then falling to 30.7% by 2018. Maternal age, education, employment, autonomy in decision-making, caesarean sections, and deliveries attended by trained birth attendant deliveries in health facilities all have a substantial impact on PNC utilization rates. The study also identifies differences in PNC utilization due to community and institutional characteristics, emphasizing the need for targeted public health initiatives to improve access and quality of PNC services. The study emphasizes the significance of addressing sociodemographic and healthcare accessibility issues to improve PNC services and outcomes in Pakistan (36). Rahaman et al., (2024) conducts a critical analysis of the standard maternal continuum of care (SMCoC) in Pakistan, using nationally representative data from the 2017-18 Pakistan Demographic and Health Survey. The study focuses on the World Health Organization's new SMCoC framework, which includes for atleast eight prenatal care visits, competent birth atte-

ndants during delivery and postnatal care within 48 hours of labor. The study employs a strong analytical approach, which includes descriptive statistics, bivariate analysis, multilevel logistic regression models, and Fairlie decompo-sition analysis, showed an alarmingly low use rate of all SMCoC services, with only 12% of women rece-iving the entire range of therapies. The study identified education and household wealth as significant determinants, with highly educated women and those in the wealthiest quintile being much more likely to use full SMCoC services. Other important characteristics include media exposure, women's autonomy, healthcare acce-ssibility, residency, and geographical differenc-es. Rahaman et al. emphasize the importance of a multimodal approach to improving equal access to maternal healthcare, which addresses indiv-idual, social and geographical barriers. This study focuses on the on the barriers and facil-itators of maternal healthcare use in Pakistan, advocating for personalized measures to enh-ance health outcomes for women in diverse soci-oeconomic, geographical circumstances and emphasizing the urgent need for targeted inter-ventions to enhance maternal health outcomes

(37). Farrar et al., (2024) conducted an exten-sive crosssectional survey to address the alar-ming rates of maternal, perinatal, and neonatal death in GilgitBaltistan, Pakistan, a region known for its isolated and difficulttoaccess comm-unities. The study surveyed 10,264 homes bet-ween June and August 20-21, with a stratified, two-stage sampling design to estimate infant mortality rates and guide the conduct of a cluster randomized controlled trial (cRCT). The results indicated crucial health indicators: the maternal mortality ratio was 225 deaths per 100,000 live births, the stillbirth rate was 41.4 per 1,000 births, and the newborn mort-ality rate (NMR) was 16.2 per 1,000 live births. Notably, Lady Health Worker (LHW) home visits were associated with lower rates of postpartum hem-orrhage (PPH) and late neonatal death. These findings emphasized the critical need for scalable, community-based interventions to reduce unnecessary maternal and newborn deaths, in line with broader public health objectives and the 2030 Sustainable Deve-lopment Goals. This study underscores the effectiveness of communitybased health worker initiatives in addressing maternal and neonatal health emergencies in undeveloped areas (38).

Table 1: Demographic analysis of participants

Authors	Year	Location	Study Design	Results	Ref
A.Mahmood et al.	2010	Ten districts of Pakistan	Qualitative study, survey findings of baseline and end-line household	PAIMAN project positively enhanced maternal and neonatal health indicators including expert delivery assistance and reduction in mortality rates. Recommendations for expanding	(21)

				successful interventions and create a sustainable framework.	
X Hou et al.	2011	Pakistan	Crosssectional Analysis of survey data	Empowering women and enhancing decision-making skills positively associated with reproductive health service utilization in Pakistan, necessitating policies targeting both men and women.	(22)
AS.Nyamtema et al.	2011	Resource limited countries	Systematic review	Explored interventions encompass delivery assistance, emergency obstetric care, and community-oriented maternal health care initiatives aiming to improve maternal health and their diverse effects on maternal well-being. Recommendations	(19)

				include bolstering healthcare infrastructures, enhancing availability of skilled birth attendance and emergency obstetric care and addressing socio-economic and cultural determinants.	
ZA.Bhutta et al.	2013	Pakistan	Review and Analysis of existing data	The study identified significant challenges in RMNCH, including high maternal and child death rates and limited healthcare facilities. Recommendation includes the strengthening of healthcare infrastructure, enhancing healthcare accessibility and implementing evidence-based interventions.	(23)
Z.Mumtaz et al.	2014	Punjab, Pakistan	Qualitative study involving questionnaires, group discussions	Poverty, financial constraints. and reliance including	(24)

				gendered norms and poverty, hinder women's access to nece-ssary care and prevent complic ations. From emerging as the primary reason for mortality and disability in Pakistan. Recomm-endations for policy reforms to address social and economic marginalisation and to enhance the maternal healthcare services.	
O.Pasha et al.	2015	Thatta, Pakistan	Prospective study	The Pakistani site has a high maternal mort-ality ratio, stillbirth, neon-atal, and peri-natal mortality rates, emph-asizing the need for immediate investigation into gaps in facility/skilled delivery care and program improvement.	(25)

| Z.Memon et al. | 2016 | Rural, Pakistan | Qualitative study using in-depth interviews and group discussions | Study identifies persistent barriers including socio-cultural restrictions, a lack of awareness, limited healthcare infrastructure, and economic challenges. Recommendation is to boost community engagement, improve healthcare infrastructure, increase awareness campaigns, and address economic barriers to enhance the health services utilization. | (26) |
| YB.Nisar et al. | 2016 | Urban and Rural, Pakistan | Qualitative explorative study using in-depth interviews | Study explore that woman in rural area faced more pronounced challenges compared to urban areas due to the various significant factors that discouraged frequen ANC visits. | (27) |

				Steps should be taken to enhance accessibility and availability of health services, addressing financial barriers through subsidies and incentives, engaging community leaders.	
T. Firoz et al.	2018		Proposal based on Maternal Morbidity Working Group	Aimed at addressing maternal mortality through healthcare interventions. Study emphasizes the importance of identifying, measuring and managing health outcomes. Proposal for implementation of developed framework, improving data collection, reporting mechanism to reduce the maternal mortality globally.	(28)

A.Aziz et al.	2020	Pakistan	Population-based observational study (MNHR)	Pakistani site experienced high prevalence of maternal and newborn death rates compared to alternate sites in the Global Network, and worse medical care for pregnant women and infants. Recommendations for improving maternal and neonatal care at all levels.	(29)
M.Mustafa et al.	2020	Pakistan	6 Months Long Qualitative and empirical study	Patriarchal norms and inadequate healthcare services contribute to poor maternal health outcomes. Recommendations for designing culturally sensitive interventions.	(30)
S.Omer et al.	2021	Dera Ghazi Khan, Pakistan	Qualitative study with thematic analysis(Interviews and focus groups)	Significant social and cultural factors including cultural practices, gender	(31)

				discrimination and women's lack of autonomy. affecting maternal mortality in Pakistan, Recommendations for addressing these issues and sociocultural norms for reducing maternal mortality rates.	
M. Malik et al.	2021	South Punjab, Pakistan	Qualitative study, Interviews, Thematic Analysis.	Highlights challenges faced by women in Pakistan in accessing maternal healthcare services, including lack of awareness, financial constraints, and social and cultural pressure. Recommendations entail implementing culturally sensitive health services,	(32)

				enhancing resource accessibility and addressing financial barriers. Recommendations entail implementing culturally sensitive health services, enhancing resource accessibility and addressing financial barriers.	
Shaeen et al.	2022	Pakistan	Literature Review, Qualitative Analysis.	Pakistan's high maternal mortality rates stem from systematic challenges in healthcare delivery. Efforts have involved initiatives to improve access to maternal health services and infrastructure. Recommendations emphasized the importance of strengthening healthcare systems to mitigate maternal mortality.	(11)

S.Naz et al.	2022	KPK, Pakistan	Qualitative study, focus groups	women's autonomy, and home birth preference, profoundly affect maternal mortality rates. Recommendations involve raising awareness about social and cultural risks, empowering women, advocating institutional deliveries, and providing comprehensive maternal healthcare services.	(33)
F.Emmanuel et al.	2022	Pakistan	Literature review	Pandemic has indirectly influenced healthcare services, reduced access to healthcare, disruption in health services and increased maternal and child health risks. Recommendations include enhancing .	(34)

				health system resilience, telemedicine and adoption to ensure continuity of essential maternal and child healthcare services during public health emergencies.	
F.Midhet et al.	2023	Pakistan	Analysis of data from survey	Study identified socio-economic, demographic and healthcare determinants that effect maternal health service utilization. Recommendation focus on the need of developing policies to support low-income families, ensure accessibility and affordability of healthcare services, enhance awareness and design cultural sensitive interventions.	(35)

S.Iqbal et al.	2023	Pakistan	Longitudinal analysis	Study presents the significant trends and variables that govern maternal and infant PNC uptake at many levels (individual, home, and community). Recommendations involve targeted interventions at different levels to boost postnatal care utilization such as policy reforms, community participation and healthcare access.	(36)
M.Rahaman et al.	2024	Pakistan	Application of WHO Recomm-endation	The study reveals that Pakistani women lack full assess SMCoC services influenced by factors like education, wealth, media exposure, autonomy, and geographical healthcare accessibility.	(37)

				Study recommends adjusting the WHO's maternal care framework to better align with socio-cultural and healthcare infrastructure, enhancing maternal health outcomes through tailored interventions and culturally sensitive approaches.	
DS.Farrar et al.	2024	Gilgit-Baltistan, Pakistan	Cross-sectional survey	Highlights the correlation between improved maternal, child mortality outcomes, and Lady Health Workers (LHW) coverage, which is associated with increased access to perinatal health services. Recommendations include expanding LHW coverage, enhancing their contribution in	(38)

				perinatal healthcare services, and strengthening referral systems.	

DISSCUSSION:

This systematic review synthesizes the findings from 20 significant studies and analyzes published literature from 2010 to 2024 on challenges of maternal and reproductive health faced by Pakistan. The review aims to provide a comprehensive understanding of the challenges, interventions, and outcomes associated with maternal and newborn health in Pakistan. These articles cover a wide range of topics, including program evaluations, social and cultural determin-ants, barriers to healthcare utilization, the impact of the COVID-19 pandemic, and interventions for improving maternal and reproductive health outcomes in Pakistan. They collectively offer a robust foundation for analyzing the complex and multifaceted issues related to maternal and reproductive health in the country. Several studies have highlighted Pakistan's alarming maternal, fetal, and child death rates. According to Bhutta et al. (2013) and Aziz et al. (2020), Pakistan has some of the highest mortality rates in the world, indicating a serious public health problem (23,29). Similarly, Pasha et al. (2015) compare these outcomes to those of other low- and middleincome nations, indicating significantly poorer results in Pakistan, emphasizing the urgent need for intervention. Social and cultural factors influence healthcare availability in Pakistan (25). Mumtaz et al. (2014) and Naz et al. (2022) examine how socioeconomic status, education, and cultural norms affect healthcare access (24,33). Omer et al. (2021) investigate the negative impact of patriarchal structures and spiritual healing practices on maternal mortality (31), while Malik et al. (2021) discuss women's expectations, experiences, and highlight the gaps between healthcare services (32). Memon et al. (2016) and Nisar et al. (2016) investigate the barriers to healthcare utilization in rural and urban areas (26,27). These studies identify community views and infrastructure issues as major barriers. Midhet et al. (2023) present findings from the Pakistan Maternal Mortality Survey, highlighting factors influencing maternal health service utilization in various areas (35). Hou et al. (2011) emphasize the significance of women's decisionmaking authority in increasing the use of reproductive health care (22). Research indicates that empowering women to make health decisions positively influences service utilization. Communitybased strategies and integrated health interventions are essential for improving maternal and newborn health outcomes. Mahmood (2010) demonstrates the positive impact of the PAIMAN project, showing significant improvement in health outcomes (21). Farrar et al. (2024), emphasize the importance of community health workers in extending healthcare (38). Nyamtema et al. (2011) conduct a systematic assessment of maternal health interventions in resourcelimited settings, emphasizing the significance of integrated health packages for improving maternal health (19). Firoz et al. (2018) propose a framework for healthcare interventions to address maternal morbidity effectively (28). Emmanuel et al. (2022) investigate the indirect consequences of the COVID-19 pandemic on reproductive, maternal, neonatal, and child health services in Pakistan, demon-strating service disruptions and exacerbating health inequities (34). Iqbal et al. (2023) analyze trends in the determinants of maternal and infant postnatal care utilization, providing insights into the shifting landscape of healthcare access by identifying persistent barriers and areas for improvement (36). Shaeen et al. (2022)

make recommendations for addressing Pakistan's maternal mortality concerns, highlighting the importance of comprehensive strategies such as legislative improvements, health system strengthening, and community participation (11).

CONCLUSION:

This systematic review combines evidence from diverse studies, presenting a comprehensive view of maternal and reproductive health issues in Pakistan. The review's aims to provide a complete understanding of the issues, interventions, and outcomes associated with maternal and newborn health in the context of Pakistan's unique sociopolitical setting. It reveals a broad and complex landscape with major barriers and opportunities for improvement. The findings highlight critical challenges posed by Pakistan's high rates of maternal, fetal, and child mortality, which are among the highest globally. These negative outcomes are inextricably linked to a various social factors such as educational gaps, socioeconomic status, cultural norms, political instability, natural disasters, systemic constraints and residual barriers in rural areas further complicate the landscape of maternal and reproductive healthcare services.

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BK: Main author, idea conception and write up

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