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Socioeconomic Status and Educational Level as a Barrier to Accessing Maternal Healthcare in Abbottabad, Pakistan: A Cross-Sectional Study

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Abstract

In low- and middle-income countries, such as Pakistan, maternal health outcomes remain a significant public health concern. Decreased access to prenatal, intranatal, and postnatal care is strongly linked to socioeconomic inequality and female educational levels. To design equitable healthcare interventions, it is necessary to understand the barriers to healthcare access. This was a hospital-based cross-sectional survey with a sample size of 349 undergoing maternity treatment at Women and Children Hospital, Jinnah International Hospital, and Ayub Medical Complex in Abbottabad, and convenience sampling was used. A self-structured questionnaire was designed to collect the required information on the variables. SPSS version 20 was used to analyze the data to determine how these factors related to one another, and Chi-square tests were used; p-values <0.05 were considered statistically significant. Most of the participants were from rural areas, joint households, and were aged between 25 and 29 years. About 28.9% of them were uneducated, while 71.6% were from low-income families. Only 36.7% of women completed the four antenatal care visits, while 16.6% attended at least one visit. In addition, 93.2% of the women gave birth in government and private clinics. Only 38% of them received postnatal check-ups after six weeks. There is a strong association between a woman's educational level and her use of maternal health services. Women with higher educational levels are likely to seek prenatal health care at an earlier gestational age. In addition, we established a strong association between women's chances of receiving postnatal check-ups and household income. Women are likely to face financial constraints due to a lack of funds (67.9%) and the distance to health facilities (14.9%). In Abbottabad, socioeconomic status and educational level are key barriers to maternal health care, and this is evident through our research. These are the fundamental issues that need to be addressed to effectively improve maternal and child health.

Keywords Socioeconomic status, Maternal and Child Health, Barriers, Healthcare, Antenatal Care

1. Introduction

One of the critical health concerns that persists today is maternal mortality, particularly in Pakistan. These persistent high rates emphasize the urgent need to improve the accessibility and utilization of maternal healthcare services. This situation is further complicated by a multitude of factors that create significant hurdles for pregnant women seeking maternal healthcare services (1). This study assesses the impact of socioeconomic status and educational

levels that contribute to these barriers, focusing on the experiences of antenatal and postnatal women in Abbottabad, Pakistan (2).

Educational level, closely associated with Socio Economic Status (SES), significantly affects maternal healthcare service utilization. Low educational levels correlate with limited health knowledge, reduced number of antenatal visits, and increased risk of maternal and neonatal mortality (3, 4). Educated pregnant women have better knowledge of danger or warning signs of pregnancy complications, seek timely

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care, and communicate better with their healthcare providers. In resource-limited settings, these barriers are exacerbated by systemic issues such as poor infrastructure, cultural norms, and provider biases (5, 6).

According to a study conducted in Uttarakhand by Chimankar *et al.*, a mother's educational attainment positively influences her use of complete Antenatal Care (ANC). Compared to women without even one year of school, highly educated women are five times more likely to receive prenatal care (7). Mother's low educational attainment in our study affects her use of Maternal and Child Health (MCH) services. Antenatal Care (ANC) participation was higher among those with a primary education than among those who could not read or write. It is well established that education lowers infertility and gives women more decision-making power (8). Prior research demonstrated that a mother with higher levels of education was better able to manage her health throughout pregnancy and provide better care for her unborn child (9).

Educational level plays a pivotal role in shaping health-seeking behavior. Women with little or no education are less likely to recognize pregnancy-related complications and are less aware of the benefits of professional medical care. These issues are compounded by sociocultural barriers and a lack of male partner support, who emphasize the importance of spousal attitudes in family planning and reproductive health decisions (9). Additionally, the lack of autonomy and gender inequalities further diminish women's ability to make informed decisions about their reproductive health (10, 11).

According to a survey conducted by Okoli *et al.*, women between the ages of 25 and 34 attend more Antenatal Care (ANC), and those with a secondary education are more likely than those without one to utilize the maternal healthcare facilities that are accessible (12). Health literacy also plays a major role; women with low education fail to recognize warning signs of pregnancy complications, which leads to a delay in seeking care, leading to deaths and disabilities that are often preventable (10, 13).

In addition to educational level, previous research has also shown that socioeconomic and demographic factors, cultural characteristics, and geographic inequality also have an impact on women's health care access and their barriers (11). Compared to women

from lower socioeconomic backgrounds, those from higher socioeconomic backgrounds have better utilization of maternal healthcare services (14).

According to the Pakistan Demographic and Health Survey (PDHS) 2017–18, reports significant inequalities in maternal healthcare utilization that have been identified, particularly among women from lower socioeconomic backgrounds and those residing in rural areas (NIPS, 2019). Economic constraints and inaccessibility to healthcare facilities lead to a lack of antenatal care, skilled birth attendance, and postnatal care (15). Previous studies have identified that factors, including wealth status, education, autonomy, and regional disparities, influence maternal healthcare utilization in Pakistan (13).

Socioeconomic status (SES) has a significant impact on mother and child health outcomes and is considered one of the major health predictors for various illnesses and disorders worldwide. (16). When a higher level of care is required, the household's socioeconomic status directly facilitates access to high-quality healthcare by improving affordability and accessibility. Higher education, greater access to sanitary facilities and clean water, better diet, and knowledge of healthy habits all lower the incidence of household illnesses, demonstrating how Socioeconomic status (SES) also indirectly affects health (17).

This study aims to assess the extent to which socioeconomic status and educational level act as barriers to accessing maternal healthcare in Pakistan. Understanding these barriers is essential for designing equitable healthcare interventions and achieving global health targets such as the Sustainable Development Goals (SDGs) related to maternal and child health (18, 19).

2. Materials and Method

A hospital-based cross-sectional survey was conducted with 349 women undergoing maternity treatment at the Women and Children Hospital in Abbottabad, Jinnah International Hospital, and Ayub Medical Complex from May 2025 to August 2025, with convenience sampling used. To collect data on demographics, socioeconomic status, maternal healthcare access, and perceived barriers, a self-structured questionnaire was made. Maternal health care services Includes antenatal, delivery and postnatal care. The study included all the women receiving prenatal, intranatal, and postpartum

care at these institutes. Extremely complicated, chronic, and serious cases, and those who refused consent have been excluded. There is no specific diagnostic criterion in this study SPSS version 20 was then used to analyze the data and determine how these factors related to one another. Chi-square tests were used to evaluate correlations between variables, and p-values <0.05 were considered statistically significant. Ethical approval for the study was obtained from the institutional review boards of all participating hospitals, and informed consent was secured from each participant before data collection to ensure adherence to ethical guidelines.

3. Results

A total of 349 women participated in the study. 102 participants were between 25 and 29 years old (29.2%). About 186 participants (53.3%) lived in rural areas. 219 women (63%) lived in a joint family system. Regarding education, 101 participants (28.9%) had no formal schooling, while only 7 participants (2%) pursued postgraduate studies. Regarding the husband's education, 102 (29.2%) completed secondary school, while only 17 (4.2%) pursued postgraduate studies. Regarding the husband's occupation, 127 (36.4%) were laborers, while 26 (7.4%) were unemployed. Overall, 319 (91.4%) of women attended at least one antenatal care (ANC) visit, while only 128 (36.7%) completed the recommended four or more visits. The primary place of antenatal care for 268 participants was government hospitals (76.8%), and 238 participants (68.2%) experienced no pregnancy complications. Tetanus toxoid vaccine was received by 236 participants (67.6%), in whom 202 (84.9%) received 2 doses, while the rest received only one. The government hospitals were preferred for delivery by 275 participants (78.8%), while 42 (12%) preferred private clinics and 29 (8.3%) preferred home births. Institutional delivery was reported by 185 (94.4%) postnatal participants, whereas 12 (6.6%) delivered home. 177 (92.2%) of these deliveries were assisted by doctors. Postnatal care within 6 weeks of delivery was utilized by 70 participants (38%). The most reported barriers to accessing maternal healthcare were lack of financial resources reported by 237 participants (67.9%), distance to health facilities by 52 participants (14.9%), lack of knowledge by 17 participants (5.2%),

and 17 (4.9%) cited a lack of family support. The main suggestions given for improvement of maternal healthcare access were to lower the cost reported by 215 (61.6%), enhancing healthcare accessibility by 47 participants (13.5%), and providing education about maternal healthcare services by 41 participants (11.7%). Availability of healthcare providers was also reported by 25 participants (7.2%), while 12 participants (3.4%) suggested financial assistance programs.

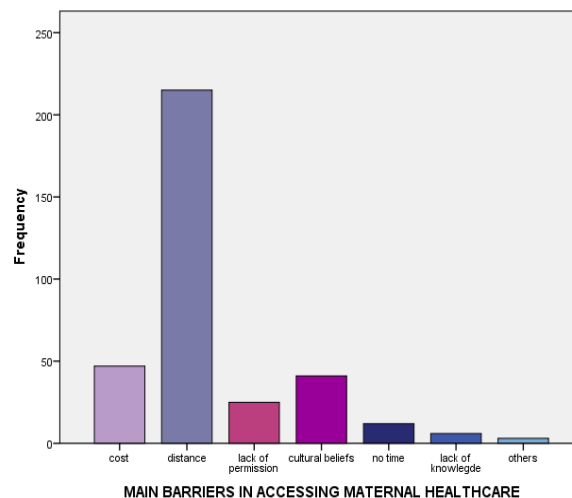


Figure 1: Main barriers in accessing maternal healthcare.

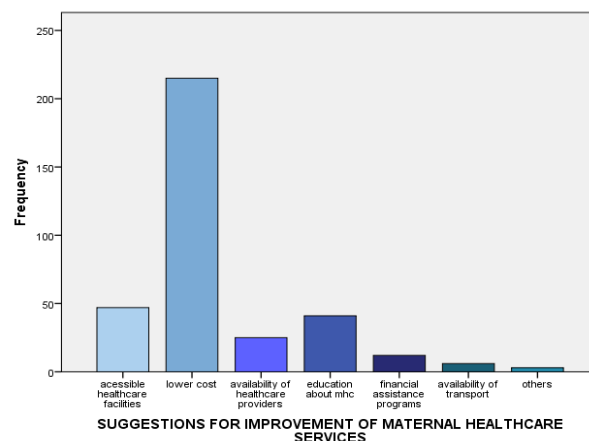


Figure 2: Suggestion for improvement of maternal healthcare services.

A statistically significant association was found between participants' educational level and maternal healthcare utilization using the chi-square test. Women with higher education were more likely to initiate

antenatal care earlier ($p=0.001$) and had more frequent antenatal visits ($p<0.000$) compared to those without formal education. The participants also showed a preference for institutional delivery over home birth ($p = 0.004$). Furthermore, a significant association was observed between education and awareness of maternal healthcare services ($p = 0.001$), with educated women demonstrating greater awareness. The husband's educational level was also significantly associated with the frequency of antenatal visits ($p = 0.03$); women with more educated husbands were more likely to visit health facilities more frequently. However, the husband's educational attainment was not found to be significantly related to the level of support given in maternal healthcare ($p = 0.453$).

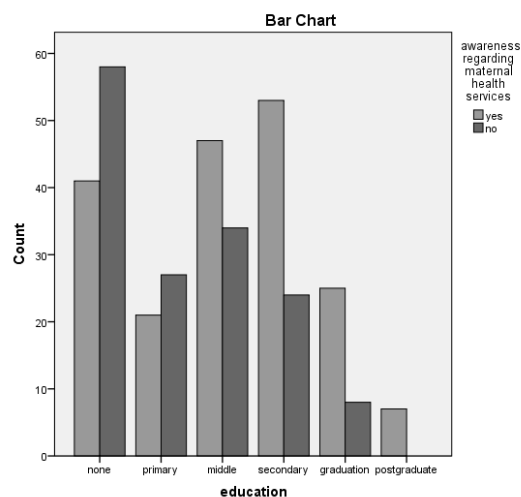


Figure 3: Association of education with awareness regarding maternal healthcare.

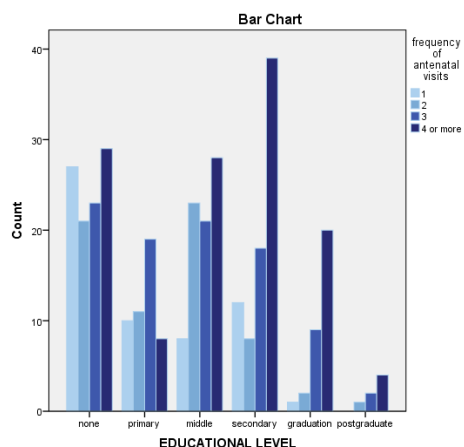


Figure 4: Association between educational level and frequency of visits.

Household monthly income was significantly associated with the place of antenatal care ($p < 0.001$). Women with higher household income were more likely to receive antenatal care in better-equipped facilities. Cost-related barriers were linked to fewer antenatal visits compared to women without financial constraints ($p = 0.022$). Household income also showed a significant relationship with attendance at postnatal check-ups within six weeks ($p = 0.002$), with higher-income women more likely to utilize postnatal services. However, no significant association was observed between household income and frequency of antenatal visits ($p = 0.84$).

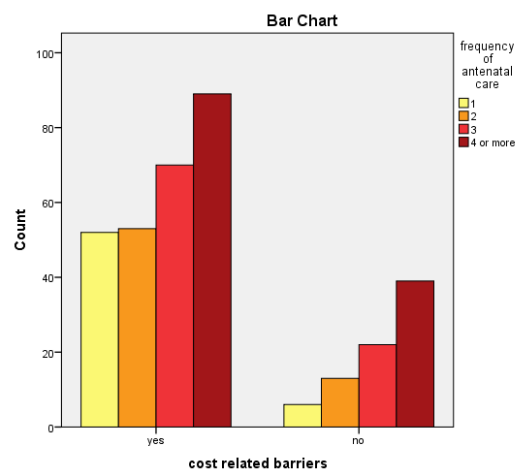


Figure 5: Association between cost-related barriers and frequency of antenatal visits.

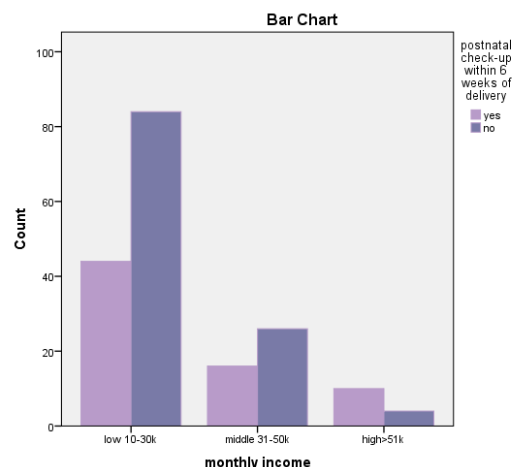


Figure 6: Association between monthly income and postnatal check-up.

Pregnancy complications did not show significant associations with maternal healthcare utilization variables. A non-significant relationship was found between pregnancy complications and assistance during delivery ($p = 0.569$), as complications occurred regardless of whether skilled professionals assisted deliveries. Similarly, no significant association was observed between pregnancy complications and timing of the first antenatal check-up ($p = 0.260$) or with maternal age ($p = 0.428$).

4. Discussion

The study reveals a clear association between women's social and educational background and their ability to access maternal healthcare, further supporting existing knowledge, and thus, supporting the discussion about maternal health overall.

Women who had higher socioeconomic and educational levels were more likely to receive quality care than women living in poverty or with a lower educational level. The Pakistan Maternal Mortality Survey (2019) supports the study's findings; the receipt of maternal health services, which include antenatal services and skilled birth attendance, is linked to a woman's education level and socioeconomic status. In addition, there was a noticeable gap in access between urban women and rural women; access to care for urban women was much greater than that in rural areas (20).

Another major barrier identified was cost. Participants identified cost as a significant barrier to accessing needed care. These results mirror studies from other low- and middle-income countries; many women from low- and middle-income countries refrain from using available services because they cannot afford them (21). A finding within our study reveals a similar pattern; the majority of the study's participants reported using government hospitals, with very few able to use private facilities, indicating that economic factors significantly affect antenatal visits in terms of location and frequency. These results are in line with other studies on Pakistani mothers' use of healthcare, especially in low-income groups. Public sector utilization rises with maternal education, monthly household income, and distance to healthcare facilities. As a result, for many people, public hospitals are their only viable choice (22). Nevertheless, Punjab has also reported problems with overcrowded facilities, lengthy

waiting times, and overworked staff because of this high demand (23).

Our study also revealed that educational attainment and awareness are central to healthcare utilization. Women with limited or no formal education were less likely to recognize the importance of completing the full series of antenatal visits or postnatal check-ups. Comparable findings have been reported in other parts of Pakistan, where low literacy rates were associated with lower healthcare utilization and higher maternal mortality. As a Research from the Kashmir Valley highlighted education as a critical determinant of maternal survival (24). Our results further demonstrate that both the woman's and her husband's educational level influenced maternal healthcare utilization, reflecting the role of household dynamics in healthcare decision-making. This is also shown in a study done in Indonesia, which concluded that the likelihood of attending antenatal care (ANC) visits was 3.376 times higher among husbands with higher education compared to those without formal education (25).

Preventive care uptake, such as tetanus toxoid vaccination, was also suboptimal, with many women receiving the first dose but not completing the second, again pointing to gaps in awareness and follow-up. This is consistent with the research conducted in Benin City that tells us about receiving Tetanus Toxoid (TT) Doses by pregnant mothers. The study reveals that only 5 % of pregnant mothers received all the Tetanus Toxoid (TT) doses, and this is mostly due to a lack of awareness about Tetanus Toxoid (TT) vaccination (26).

While some data indicate that socioeconomic position no longer independently raises the risk of pregnancy complications, cost-related issues still delay timely care among women. Many women are deterred from choosing a referral or better service due to costs associated with opportunity loss (i.e., loss of income to visit) as well as travel distance. This highlights how the existence of health services is limited by indirect costs. For comparison to Indonesia, we have found that financial protection can alleviate barriers to access. When the Universal Health Coverage (UHC), Jaminan Kesehatan Nasional (JKN) program was initiated, it reduced out-of-pocket expenses for maternity health services, which led to increased use of antenatal care, attendance at facility births, and contact with doctors for the delivery over time. This

program encourages women to first visit a primary care health centre/clinic before proceeding to an appropriate level of hospital if a complication arises, providing an appropriate level of reasonable cost-control while providing increased access to skilled care (27).

Cultural & social barriers to accessing health care were also problematic. For example, many women were not allowed or able to seek health care without having permission or approval from family members, especially in joint families. Lack of autonomy is like other findings from rural Tanzania, where autonomy as well as cultural beliefs have also been substantial barriers to the use of reproductive health services/antenatal services (28).

Other barriers included distance and lack of transportation, which were particularly challenging for rural women due to limited facilities. The findings are consistent with previous research conducted in Ghana, where transportation was a key barrier to child and maternal health care (29).

The findings of our work also stress that husbands are an important part of maternal healthcare service utilization. In more than half of families, the husband was the primary decision-maker for maternity services utilized by their partners. Having more educated husbands in the household was associated with women accessing antenatal care more frequently; this result also highlights the importance of involving men in maternal health awareness and interventions. Likewise, research conducted in Indonesia has demonstrated that the husband's educational level is important for accessing antenatal care; husbands with higher education are more likely to manage pregnancy-related complications based on their knowledge of antenatal care (decision-making authority), similar to what we found. In addition, our research shows that using the husband's education level and decision-making authority improves the pregnancy journey with fewer complications (25).

These findings strongly illustrate that the use of maternal healthcare is affected by socioeconomic status, educational level, cultural norms, and decision-making authority. These findings demonstrate that any interventions aimed at improving access to maternal healthcare must include not only addressing the financial security and availability of services but also providing education and increased awareness, as well

as providing women with the opportunity to make their own decisions about their health.

5. Limitations

There are limitations to this research. The research only included patients at some of the hospitals included in the study. Therefore, the research sample only includes women from those hospitals and does not include women who may have sought care from other facilities or women who do not use maternal health services. The use of a convenience sample further restricts the validity of the generalizations made to the wider Abbottabad population. Women in the upper socioeconomic class were in relatively small numbers because the sample only included one private facility with a smaller patient load than the public hospitals.

6. Conclusion

The study concludes that socioeconomic status and maternal educational level are major determinants of maternal healthcare access and utilization. Financial barriers, geographical issues, limited awareness, distance to facilities, and a lack of autonomy in decision-making were identified as the most pertinent obstacles that hinder adequate care. Although initiation of antenatal care was satisfactory, continuity of care remained limited, and post-natal checkups were especially found to be inadequate.

The study reveals that improving maternal health outcomes requires a comprehensive approach. In addition to removing financial barriers, health education, male involvement in decision-making, and geographical issues need to be addressed. Addressing these interlinked social, cultural, and economic barriers is critical for advancing maternal health and moving closer to achieving national and global health goals.

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References

1. Khan BA, Mahmood H, Ahmed JM, Anwar B, Muhammad A, Jabeen R. Exploring challenges in accessing primary healthcare for pregnant women in Pakistan: a qualitative descriptive study. *BMC Health Serv Res.* 2025;25(1):482.
2. Afridi JR, Jan SA, Asif MF. Assessing inequality of opportunity in access to maternal healthcare services in Pakistan: a quantitative attempt. *BMC Health Serv Res.* 2025;25(1):1167.
3. Tripathi P, Singh N. A need for maternal health literacy to promote maternal and neonatal health: a review. *Int J Health Sci Res.* 2019;9(8):467-72.
4. Smith-Greenaway E. Maternal reading skills and child mortality in Nigeria: a reassessment of why education matters. *Demography.* 2013;50(5):1551-61.
5. Munthali AC, Swartz L, Mannan H, MacLachlan M, Chilimampung C, Makupe C. "This one will delay us": barriers to accessing health care services among persons with disabilities in Malawi. *Disabil Rehabil.* 2019;41(6):683-90.
6. Elmusharaf K, Byrne E, O'Donovan D. Strategies to increase demand for maternal health services in resource-limited settings: challenges to be addressed. *BMC Public Health.* 2015;15(1):870.
7. Chimankar DA, Sahoo H. Factors influencing the utilization of maternal health care services in Uttarakhand. 2011;5:209-16.
8. Ogbo FA, Dhama MV, Ude EM, Senanayake P, Osuagwu UL, Awosemo AO, et al. Enablers and barriers to the utilization of antenatal care services in India. *Int J Environ Res Public Health.* 2019;16(17):3152.
9. Asif MF, Pervaiz Z, Afridi JR, Abid G, Lassi ZS. Role of husband's attitude towards the usage of contraceptives for unmet need of family planning among married women of reproductive age in Pakistan. *BMC Womens Health.* 2021;21(1):163.
10. Asif MF, Ali S, Ali M, Abid G, Lassi ZS. The moderating role of maternal education and employment on child health in Pakistan. *Children (Basel).* 2022;9(10):1559.

11. Badu E, Gyamfi N, Opoku MP, Mprah WK, Edusei AK. Enablers and barriers in accessing sexual and reproductive health services among visually impaired women in the Ashanti and Brong Ahafo regions of Ghana. *Reprod Health Matters*. 2018;26(54):51-60.
12. Okoli C, Hajizadeh M, Rahman MM, Khanam R. Geographical and socioeconomic inequalities in the utilization of maternal healthcare services in Nigeria: 2003-2017. *BMC Health Serv Res*. 2020;20(1):849.
13. Zakar R, Zakar MZ, Aqil N, Chaudhry A, Nasrullah M. Determinants of maternal health care services utilization in Pakistan: evidence from Pakistan demographic and health survey, 2012-13. *J Obstet Gynaecol*. 2017;37(3):330-7.
14. Yaya S, Uthman OA, Amouzou A, Ekholuenetale M, Bishwajit G. Inequalities in maternal health care utilization in Benin: a population based cross-sectional study. *BMC Pregnancy Childbirth*. 2018;18(1):194.
15. National Institute of Population Studies (Pakistan), ICF. Pakistan demographic and health survey 2017-18. Islamabad: NIPS/Pakistan and ICF; 2019.
16. Neal S, Falkingham J. Neonatal death and national income in developing countries: will economic growth reduce deaths in the first month of life? *Int J Popul Res*. 2014;2014:989485.
17. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet*. 2008;371(9608):243-60.
18. McArthur JW, Rasmussen K, Yamey G. How many lives are at stake? Assessing 2030 sustainable development goal trajectories for maternal and child health. *BMJ*. 2018;360.
19. Lee JW. Global health improvement and WHO: shaping the future. *Lancet*. 2003;362(9401):2083-8.
20. Midhet F, Hanif M, Khalid SN, Khan RS, Ahmad I, Khan SA. Factors associated with maternal health services utilization in Pakistan: evidence from Pakistan maternal mortality survey, 2019. *PLoS One*. 2023;18(11):e0294225.
21. Sarikhani Y, Najibi SM, Razavi Z. Key barriers to the provision and utilization of maternal health services in low- and lower-middle-income countries; a scoping review. *BMC Womens Health*. 2024;24(1):325.
22. Akhtar S, Ahmed Z, Nair KS, Mughal YH, Mehmood A, Rehman W, et al. Effect of socioeconomic factors on the choice of health care institutions for delivery care. *Open Access Maced J Med Sci*. 2022;10(E):1571-81.
23. Tasneem S, Ozdal MA. Pregnant women's perceptions of the quality of antenatal care in a public hospital in Punjab, Pakistan during COVID-19: a cross-sectional study. *Healthcare (Basel)*. 2023;11(7):996.
24. Batool N, Shah SA, Dar SN, Skinder S, Jeelani P. Impact of female literacy on infant mortality and maternal mortality in Kashmir valley: a district level analysis. *GeoJournal*. 2020;85(6):1545-51.
25. Wulandari RD, Laksono AD, Matahari R. Does husband's education level matter to antenatal care visits? A study on poor households in Indonesia. *Indian J Community Med*. 2022;47(2):192-5.
26. Hashami MF. Awareness of tetanus toxoid vaccination among pregnant women attending antenatal clinic in districts: Lahore & Sheikhpura-Pakistan. *GSJ*. 2020;8(2):5612-31.
27. Rizkianti A, Saptarini I, Rachmalina R. Perceived barriers in accessing health care and the risk of pregnancy complications in Indonesia. *Int J Womens Health*. 2021;13:761-72.
28. Yeates K, Chard S, Eberle A, Lucchese A, West N, Chelva M, et al. 'She needs permission': a qualitative study to examine barriers and enablers to accessing maternal and reproductive health services among women and their communities in rural Tanzania. *Afr J Reprod Health*. 2021;25(2).
29. Dotse-Gborgbortsi W, Nilsen K, Ofosu A, Matthews Z, Tejedor-Garavito N, Wright J, et al. Distance is "a big problem": a geographic analysis of reported and modelled proximity to maternal health services in Ghana. *BMC Pregnancy Childbirth*. 2022;22(1):672.

