# EXPLORING THE FACTORS AFFECTING SKILLED BIRTH ATTENDANCE IN LUMBINI PROVINCE

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## Abstract

Skill Birth Attendance (SBA) is an important intervention for the reduction of maternal and newborn mortality, especially applicable for third-world countries like Nepal and the neighboring countries in its region. Despite the national efforts, there are still regional disparities in accessing SBAs, especially in case of Lumbini province where sociological, demographic, and economic barriers are considered prominent. This study attempts to figure out the factors influencing the utilization of SBA in the Lumbini Province based on recent national survey data. The Cross-sectional analytical study conducted using data from the Nepal Demographic and Health Survey (NDHS) 2022. It used a two-stage stratified sampling design covering 14,845 women aged 15–49. A logistic regression was applied to assess the significant predictors influencing the use of SBA.

The SBA services were utilized more by younger mothers (20-24), first-time mothers, educated women, urban residents, and women from wealthier households. However, the logistic regression revealed that an increasing birth order had increased the odds of not going to SBA services (OR = 0.16, $p < 0.01$). Economic status could be considered a strong variable in predicting positive utilization. Most importantly, women in the richest quintile had about 10 times higher odds of SBA service use than those in the poorest (OR = 9.84, $p < 0.1$). Other included factors such as education, caste/ ethnicity, religion, and rural residence had lost their significance after adjustment. Economic status and birth order are important determinants of SBA utilization in Lumbini Province, which shows the persistence of inequality in accessing maternal healthcare. There should be formulated policies directed at alleviating poverty among

and supporting multiparous women to improve SBA utilization and promote maternal health results in Lumbini Province.

**Keywords:** SBA, Lumbini Province, Determinants, Maternal Health, Utilization

## Introduction

Maternal health remains an important aspect of public health internationally, especially concerning low- and middle-income countries (LMIC), where maternal mortality continues to remain a challenge. Skilled Birth Attendance (SBA), where trained health professionals provide assistance during childbirth, is regarded as a pivotal intervention for prevention of maternal and neonatal deaths (World Health Organization [WHO], 2023). Despite global efforts to promote SBA, its utilization is still subject to disparities arising from socio-demographic and economic factors, especially in regions like South Asia (Kibria, Khan, & Hossen, 2023). Although Nepal has undergone some positive steps towards attaining the Millennium Development Goals (MDGs) by improving health status of mothers it still seems to have a long way to go in order to provide equitable access to qualified midwives across provinces and population subgroup (Ministry of Health and Population [MoHP], 2022).

The MMR in Nepal has shown a decline during the last few decades, but the provincial disparities maintain the relevance for assessment on the local level. The Lumbini Province still shows the lower use of SBA among disadvantaged communities; nevertheless, the improvement of infrastructure facilities (Sharma, Aryal, & Rai, 2023). These maternal health related factors have been consistently associated with maternal health care utilization in Nepal and other similar contexts: maternal age, parity, education, caste and ethnicity, residence, and household wealth (Baral et al., 2022a). The studies established that younger women, women with higher education, women living in urban settings, and those belonging to economically advantaged households are the most likely groups to access SBA services (Tessema et al., 2023). In noticeable difference, substantially challenged by systemic barriers, for example, monetary considerations, cultural standards, and inadequate health infrastructure, are women supported by their rural backgrounds, lower caste groups, and poorer quintiles (Sarki et al., 2023).

South Asia have strongly highlighted the impact of socio-cultural contexts on maternal health behavior such as men's and elders' decision making power, local religious beliefs, and traditional practices (Yaya, Okonofua, & Bishwajit, 2022). Caste based and geographical discrimination in Nepal broaden these concerns, obstructing timely access to skilled care during childbirth (Paudel et al., 2023). National surveys, including

the NDHS, provide a sight of the landscape, but specific studies are urgently needed to highlight province specific interventions. In this regard, Lumbini Province with its diverse demographic and socio-economic stratifications provides a critical case in understanding the localized determinants of SBA utilization.

Although several studies on maternal health service utilization have been done in Nepal, the focus has largely been on data at the national level, neglecting provincial disparities or engaging multivariate analyses that address the complexity of the interplay of demographic and socio-economic factors (Acharya, Adhikari, & Neupane, 2022). Moreover, there has been little effort to highlight how birth order interrelates with economic status and education to influence SBA use, especially in provinces with high ethnic diversity such as Lumbini. Much of the existing literature ignores structural inequities and how these stand in the way of access to skilled care, particularly among women who are higher in the birth order or from marginalized castes (Bintabara & Nakamura, 2023a).

Here, existing studies have tended to focus on national aggregates with minimal disaggregation at the provincial level, therefore neglecting the peculiar socio-demographic and economic barriers in provinces like Lumbini (Baral et al., 2022b). Furthermore, these studies have mainly identified determinants in isolation from one another, like maternal education and rural-urban residence, without a sufficient exploration of the complex interactions between factors like birth order with household wealth and caste/ethnicity (Tessema et al., 2023). Important structural weaknesses like caste-based exclusion and inaccessibility, which continue poverty and create barriers to maternal health care access, have received little attention in Lumbini multivariate models (Paudel et al., 2023; Sarki et al., 2023). In fact, the multiple disadvantages experienced by multiparous women out of lower wealth quintiles still remained underexplored, even though it is shown that higher birth order and poverty interact to decrease SBA usage (Bintabara & Nakamura, 2023b). The need for province specific distributional analysis regarding intersectional inequities and local determinants of SBA use is urgent despite the great overview. Accordingly, the present study employs descriptive and inferential analyses of the recent data gathered from NDHS, providing evidence about the independent and joint effects of economic status and birth order on SBA use in Lumbini Province so as to ease the formulation of interventions related to equitable maternity care.

This study would address these gaps by examining the factors associated with Skilled Birth Attendance in Lumbini Province. The characteristic approach taken by this manuscript, compared to earlier works, is its localization involving both descriptive and

inferential methods, thereby uncovering not just who is excluded from SBA services but also why. Results will contribute to provincial health policies, ensure equitable access to maternal health services, and eliminate structural barriers to which these disadvantaged groups are subjected. The present inquiry focuses on intersectionality, with reference to economic status, parity, and social identity jointly influencing maternal health behavior and elastic detailed data to inform policy decisions and health practitioner actions aimed at reducing maternal mortality and achieving universal coverage in Nepal.

## Literature review

Skilled Birth Attendance is little progress, with Lumbini Province being a particularly difficult environment due to socio-economic, demographic, and cultural barriers barring in the way of equitable utilization of SBA (Ministry of Health and Population [MoHP], New ERA, & ICF, 2023).

Maternal education is one of the most difficult determinants of utilization of SBA. Education increases the awareness of obstetric risks among women and equips them with an understanding of how to prevent them through health care systems. Acharya et al. (2022) observed that women with secondary and higher levels of education in South Asia had substantially higher odds of seeking SBA services than those with no formal education. In Nepal, education is positively correlated with women empowerment and autonomy in health-seeking behavior; however, the extent of this impact may differ depending on other ways affecting social determinants.

Utilizing LMIC data, Tessema et al. (2023) observe that women of the richest quintile were far more likely to be provided access to skilled birth care as compared to women in the poorest. Remaining economically marginalized, in Lumbini many communities do experience real maternal result disparities along this economic gradient. Sharma et al. (2023) also assert that financial barriers remain the top limitation toward maternal service utilization in the rural and under-resourced provinces of Nepal. Similarly, parity which refers to the number of children previously born to a woman also affects the utilization of SBA services. Gebrehiwot, Alemayehu, and Fenta (2022) stated that women of higher birth order are less likely to use skilled delivery services. This conduct is germane to Lumbini, where the traditional family structure and fertility preferences normally discourage or delay institutional delivery for multiparous women. Following cultural norms and power dynamics at home also confine access to SBA. It was noted by Yaya et al. (2022) how, in South Asia, with regard to maternal health, the decisions are mostly dominated by the husband or other elder family members; thus severely

limiting the autonomy of women. Likewise, in Lumbini, due to patriarchal practice and entrenched gender roles, underutilization prevails, especially among the young and economically dependent mothers.

The obstacles, including discrimination and geographical isolation, reduce the likelihood of Dalit and Janjati women accessing skilled birth care (Paudel et al., 2023). Thus, these groups are often underrepresented in public health programs and placed as the last priority in maternal health interventions. Bintabara and Nakamura (2023a) hold the view that several disadvantages such as poverty, low education, and minority status act cumulatively to further disadvantage the use of SBA. The socio-economic status, education, parity, cultural norms, and structural inequalities influence SBA use in Lumbini Province.

## Data and methods

Nepal Demographic and Health Survey (NDHS) conducted in 2022 is a repository of various health and demographic indicators in the country. Conducted by New ERA, under the auspices of Ministry of Health and Population, the survey aimed at providing reliable estimates on fertility, family planning, maternal and child health, nutrition, and other related health issues in order to inform policy and program design (Ministry of Health and Population [MoHP], New ERA, & ICF, 2023).For 2022 NDHS, a two-stage stratified sampling design was used to ensure some kind of representation at the national level to Nepal through all the seven provinces. In the first stage, 476 primary sampling units (PSUs) were selected using the method of probability proportional to size-and this consisted of 248 urban and 228 rural clusters. Finally, 30 households were chosen systematically in each of the chosen PSUs, so that there were a total of 14,280 households as the final survey sample, according to MoHP et al. (2023). This survey had a very high response rate; interviews were completed among 14,845 women aged 15–49 and 4913 men aged 15–49 at response rates of about 97 percent and about 95 percent, respectively. The varied dataset was needed for health policymakers and practitioners to evaluate ongoing activities and develop more effective strategies toward ensuring the health status of Nepal's population (MoHP et al., 2023).

## Results

Understanding well the social as well the demographic characteristics constitutes the major part for analysing trends within maternal and child health, education as well as overall wellbeing. These areas are influenced much by age, birth order, education, religion, caste/ethnicity, residence, and wealth status. Among the most important demographic parameters are age. Age is particularly important in maternal health

research where the focus for reproductive patterns, health care utilization, and risk factors is on those in the age group 15-49. Further grouping by age cohort indicates cards on fertility and healthcare behavior across life cycle stages. Birth order is perhaps one of the most potent determinants of maternal and neonatal results, higher-order births being associated with worsening result dimensions, especially in resource-poor settings. Level of education has an important influence on health-seeking behavior. More educated mothers use maternal and child health services more, achieve better child health results, are more financially independent, and are able to make informed health care decisions. Religious affiliation also affects health behavior, reproduction choices, and health care. Major religions such as Hinduism, Buddhism, Islam, and Christianity, as well as indigenous beliefs in Nepal, guide the practices regarding childbirth, contraceptive use, and gender norms. Caste and ethnicity are two crucial factors that have deprived access to education, health care, and jobs. Complete deprivation of these accesses thus increases the potentially depriving gap in maternal health services. Area of residence, urban or rural, determines the accessibility of health infrastructure. Availability of health facilities, transportation, and the number of skilled care available for the rural women pose major setbacks. Wealth quintile, reflected through household assets and living conditions, determines how populations can be categorized and also influences the capacity to access maternal and child health services. Participation by women from lower quintiles is notably reduced to less healthcare.

The basic socio-demographic linearity when it comes to maternal and child health study. It may be very descriptive but this type of framework stands necessary for contextualizing disparity in health.

**Table 1: Distribution SBA visits the respondents**

| Variable | No | | Yes | | Total | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| **Age** | | | | | | |
| <20 | 1 | 1.5 | 25 | 6.1 | 26 | 5.5 |
| 20-24 | 22 | 32.9 | 157 | 37.8 | 179 | 37.1 |
| 25-29 | 26 | 39.1 | 135 | 32.5 | 161 | 33.4 |
| 30-49 | 18 | 26.5 | 98 | 23.6 | 116 | 24.0 |
| **Birth order** | | | | | | |
| First | 12 | 18.4 | 199 | 48.1 | 212 | 44.0 |
| Second | 21 | 31.2 | 135 | 32.5 | 156 | 32.4 |
| Third or higher | 34 | 50.4 | 80 | 19.4 | 114 | 23.7 |
| **Level of education** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| No Education | 14 | 21.1 | 48 | 11.5 | 62 | 12.8 |
| Basic Education | 53 | 79.0 | 274 | 66.1 | 326 | 67.8 |
| Higher Education | 0 | 0.0 | 93 | 22.5 | 93 | 19.4 |
| **Religion** | | | | | | |
| Hindu | 58 | 86.7 | 384 | 92.7 | 442 | 91.9 |
| Other religion | 9 | 13.3 | 30 | 7.3 | 39 | 8.1 |
| **Caste/Ethnicity** | | | | | | |
| Dalit | 21 | 32.1 | 91 | 22.0 | 112 | 23.4 |
| Janjati | 9 | 13.6 | 17 | 4.0 | 26 | 5.4 |
| Other Terai | 15 | 23.1 | 148 | 35.8 | 164 | 34.0 |
| Brahmin/Chhetri | 11 | 16.7 | 60 | 14.4 | 71 | 14.7 |
| **Place of Residence** | | | | | | |
| Urban | 39 | 57.7 | 222 | 53.5 | 260 | 54.1 |
| Rural | 28 | 42.3 | 193 | 46.5 | 221 | 45.9 |
| **Wealth quintile** | | | | | | |
| Poorest | 19 | 28.8 | 67 | 16.2 | 87 | 18.0 |
| Poorer | 18 | 26.4 | 79 | 19.0 | 97 | 20.1 |
| Middle | 15 | 22.8 | 95 | 22.9 | 110 | 22.9 |
| Richer | 13 | 19.8 | 97 | 23.4 | 110 | 22.9 |
| Richest | 1 | 2.1 | 76 | 18.4 | 78 | 16.1 |
| Total | 67 | 100.0 | 414 | 100.0 | 481 | 100.0 |

*Source: Nepal Demographic and Health Survey, 2022*

Table 1 shows that different groups are distributed across the various background variables of Skilled Birth Attendant (SBA) utilization. The facts show that there were distinct differences in SBA utilization based on age, birth order, education, religion, caste/ethnicity, place of residence, and wealth quintile. From the data, it can be said that SBA utilization is at the peak among younger women aged 20-24 (37.8%), whereas comparatively lower levels were reported for those aged 30-49 (23.6%). The birth order shows an apparent trend with first-time mothers using SBA services significantly more (48.1%) than women with higher birth order, underscoring the increased risk associated with multi-parity. It can also be richly stated that educational status is one of the significant factors affecting SBA utilization, with 22.5 percent among those with higher education and women with no education having a much lesser rate of 11.5 percent access to skilled birth attendance.

Religious status and caste/ethnicity also verified significant gaps. Hindu women dominated the SBA pool (92.7%), while women of other religions used SBA care less. Across the caste groups, women classified as Other Terai had the highest SBA

usage (35.8%), while Dalit and Janjati women reacted less. Although SBA utilization remained slightly better in urban women than in rural women (53.5% versus 46.5%), these trends exemplify differential access as one continues to health care along the rural-urban divide. Economic status, which was differentiated by the wealth quintiles, articulates the inequity even more so: rich women access more SBAs while poor women in turn have an access of only 16.2 percent. The data in the Table 1 reveal that age, birth order, education, caste, residence area, and economic status interact as various factors to determine the pattern of skilled birth attendance in Lumbini Province.

**Factors association with demographic and socio-economic variables**

With the logistic regression analysis, certain predictor variables predicted too perfectly, which resulted in the automatic deletion of these variables from the model. The variable age group became a perfect predictor of failure before it was marginalized along with one observation. Also, education categorical was a perfect predictor for success and dropped the remaining number of observations up until 79. Furthermore, it was omitted from the model because of collinearity, proving that it had a high degree of correlation with other predictors in the model. The model depicted a design with 66 degrees of freedom addressing an overall goodness-of-fit test as F(18, 49) = 3.58 and Prob> F = 0.0002, which establishes quite clearly the combined independence of variables statistically affecting the dependent variable.

**Table 2: Factors association of demographic and socio –economic variable**

| Variable | Odds Ratio | Std. Err. | T | P>\|t\| | 95% Conf. Interval | Sig |
|---|---|---|---|---|---|---|
| **Age** | | | | | | |
| 20-24 | 0.210469 | 0.1910561 | -1.72 | 0.091 | 0.0343613-1.289161 | * |
| 25-29 | 0.2843802 | 0.294272 | -1.22 | 0.229 | 0.0360281-2.244693 | |
| 30-49 | 0.3481846 | 0.3988555 | -0.92 | 0.36 | 0.035361-3.428421 | |
| **Birth order** | | | | | | |
| Second | 0.4576771 | 0.1834977 | -1.95 | 0.055 | 0.2055473-1.019076 | * |
| Third or higher | 0.1622505 | 0.0819023 | -3.6 | 0.001 | 0.0592222-0.444516 | *** |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Religion** | | | | | | |
| Other religion | 2.63713 | 3.421529 | 0.75 | 0.457 | 0.1977522-35.1675 | |
| **Caste/Ethnicity** | | | | | | |
| Mulim | 0.1576537 | 0.2156761 | -1.35 | 0.182 | 0.010268-2.420609 | |
| Janjati | 1.821553 | 1.079201 | 1.01 | 0.315 | 0.5581101-5.945165 | |
| Other Terai | 0.8712722 | 0.5136641 | -0.23 | 0.816 | 0.2685044-2.827199 | |
| Brahmin/Chhetri | 1.716741 | 0.7783188 | 1.19 | 0.238 | 0.6943666-4.244441 | |
| **Educational attainment** | | | | | | |
| Basic Education | 0.6548472 | 0.3069154 | -0.9 | 0.37 | 0.2568898-1.669295 | |
| Residence | | | | | | |
| Rural | 1.910866 | 0.9305707 | 1.33 | 0.188 | 0.7227094-5.05239 | |
| **Wealth quintile** | | | | | | |
| Poorer | 1.724122 | 0.6348391 | 1.48 | 0.144 | 0.8265975-3.596183 | |
| Middle | 2.04157 | 0.8645535 | 1.69 | 0.097 | 0.8765378-4.755082 | * |
| Richer | 2.859287 | 1.736572 | 1.73 | 0.088 | 0.8504156-9.613559 | * |
| Richest | 9.842665 | 12.06289 | 1.87 | 0.067 | 0.8519688-113.7108 | * |
| **_cons** | 18.14052 | 18.46102 | 2.85 | 0.006 | 2.378117-138.3778 | *** |

***p < 0.1*, p < 0.05**and p < 0.01 *****

The level and the likely use of Skills Birth Attendance by the demographic and socio-economic variables as measured by odds ratios are presented in Table 2. It indicates that women aged 20-24 were less likely to use the SBA services than the reference group obtaining an odds ratio of 0.21 ($p < 0.1$). Multi-parity remains a critical barrier for use of skilled care for childbirth as by increasing birth order with third or higher birth order showing great and significant reduction in odds (OR = 0.16, $p < 0.01$)

indicating that there is a lot of decrease in odds that women from multiparous families would utilize SBA services.

Women from wealthier quintiles exhibited greater odds of utilizing SBA, making economic status a prime determinant. All three categories correspondingly displayed positive signs towards the odds of SBA service utilization: "Middle," "Richer," and "Richest." The "Richest" women were nearly 10 times more likely to access SBA services (OR = 9.84, $p < 0.1$) relative to the poorest women, although it should be noted that the confidence intervals were quite wide. Other factors like education, caste/ethnicity, religion, and rural residence did not show statistically significant association. This finding underscore the fact that while certain demographic factors, such as age and birth order, negatively affect SBA use, economic status plays an essential role in enhancing access to skilled birth services in Lumbini Province.

## Discussion

This study required to explore different socio-demographic and economic factors that affected the utilization of Skilled Birth Attendance (SBA) services in Lumbini Province, Nepal. The descriptive findings of the same have revealed such clear differences in SBA uptake across age, birth order, education, caste/ethnicity, residence, and wealth. Young women, particularly aged 20-24, and first-time mothers were found to be significantly more likely to access SBA services, according to global patterns whereby younger women have been found to be much more careful and responsive towards institutional healthcare (Kibria et al., 2023). Higher educational attainment was also associated with an increase in SBA use, confirmed by evidence which stated that education enables women to seek professional maternal care (Yaya et al., 2022). In addition, rich women and residents of urban areas had a significantly greater value in terms of SBA service that supports past study that pointed out economic and infrastructural barriers especially present among rural and poorer communities (Tessema et al., 2023).

The variables under consideration, exposing much deeper insight into those associations: birth order was identified as a significant negative predictor, where further parity reported significant reduction odds of SBA availability to women. This finding have been replicated by prior research; multiparous women believe that the risks during childbirth are lesser and may depend more upon their past experience or on traditional practices (Gebrehiwot et al., 2022). Wealth status was also identified to be a significant predictor; the higher the asset quintile, the odds of SBA use increased, strengthening the evidence that financial ability indeed affects access to maternal care services (Bintabara & Nakamura, 2023b). However, opposing to expectations and prior

findings, educational status, caste/ethnicity, and residence were not found significant in the regression model. This might possibly be attributed to multi-collinearity variations of Lumbini Province.

The remarkable part comes from the above findings, where education holds an insignificant place in the regression model, and results oppose the findings coming out from studies in South Asian contexts, wherein maternal education significantly influences SBA utilization (Acharya et al., 2022).However, an extrapolation of some of these marginalised communities may be consideration: that education is insufficient for dismantling entrenched barriers created by caste discrimination or the scarcity of health care infrastructure. Likewise, an association depicting rural residence to lower SBA use was observed descriptively, however it did not reach significance in the adjusted model, probably due to improved rural health care outreach seen recently in Nepal (Paudel et al., 2023).

In my view, the findings raise interesting implications, where age and parity determine maternal health behavior at an individual level, while basic determinants, especially economic status. The wealth quintiles, economic empowerment of women with poverty eradication would yield a far greater weight for improving SBA utilization than educational attempts alone. Furthermore, those variables with wider confidence intervals suggest a much higher variability under; hence, more localized and context-specific policies would be required to address economic and cultural barriers to skilled birth care.

However, it contains certain limitations such as possible multi-collinearity among predictors, which directed to the exclusion of significant variables such as education from the regression model. Additionally, because the data is cross-sectional it excludes any causal implications, and unmeasured factors that may play a role in SBA utilization like cultural beliefs or quality of care may be significant. Moreover, this study giving it the ability to analyze trends in current SBA utilization robustly. Also, it is a combination of both descriptive and inferential statistics, which brings out the understanding of such factors.

## Conclusion

This study establishes that socio-demographic and economic aspects influence the use of Skilled Birth Attendance (SBA) services in Lumbini Province, Nepal. According to the findings, high birth order and poor economic status are the major barriers limiting access to skilled attendant during childbirth. More of the younger and first-time mothers have been using SBA services, while the regression analysis shows that economic

ability is the most consistent predictor. Contrary to expectations after adjustment for other factors, education, caste/ethnicity, and especially residing in a rural area did not show significant associations, indicating that essential and economic barriers are far more important than any individual behaviors when it comes to their mother health-seeking behavior.

These findings establish the need for some specific interventions to address the economic equity problem and support parity women. The policymakers should take into account poverty alleviation, increased financial reasons for maternal health care, and building community outreach programs targeted at multiparous women and marginalized groups. Enhancing access, affordability, and awareness toward SBA services are essential for improving equitable maternal health result status and for achieving national and global health.

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