

Original Research Article

Determinants of skilled birth attendants in Nepal: a case of Surkhet district

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Received: 31 December 2021

Revised: 06 March 2022

Accepted: 15 March 2022

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ABSTRACT

Background: Safe delivery incentive program was introduced to increase the skilled attendants at births. The program provided childbirth by skilled birth attendants as well as incentives to skilled birth attendants 'cash' to women giving birth in a health facility in addition to incentives to health provider for each delivery attended, either at home or the facility. Due to its implementation and administrative delays, the program was reformed and implemented as a 'safer mother program' popularly known as "aama-suraksha-karyakram" since January 2009.

Methods: The study was conducted in Surkhet district of Nepal. Surkhet is a hilly district and is head-quarter of mid-western development region of Nepal. There is one hospital, 5 PHCCs, 9 HPs and 38 SHPs serving 288,527 people in the district. The delivery by trained health worker (HW) in the district is 31.8% in 2005/06 which has increased about two times for two years. Surkhet is one of the districts monitoring the process indicators for safe motherhood programme in Nepal. Birth preparedness package programme has been implementing in the district from this year. The study population were the mothers within the age group of 15 to 49 years in Surkhet district. The sampling frame of the study was the mothers who had delivered the baby within 12 months preceding the survey.

Results: About one third mothers, having 0-5 poverty score, utilised delivery assisted by HWs, while about three fourth of them having more than 5 score utilised HWs as delivery assistant. Higher educated mothers utilised HWs as delivery assistant more than that of higher educated husband. Among higher educated mothers, about 85% utilised delivery assisted by HWs, while it was about 75% for higher educated husband. Occupation of mother was also significantly associated with utilisation of delivery by HWs. Mother having office work utilised about 5 times higher HWs than others as their delivery assistant. The distance to health facility was significantly associated with utilisation of delivery attendant (p value <0.001). The mothers with less travelling time to reach health facility were more likely to utilise HWs as delivery attendant. About three fourth mothers who needed less than half an hour utilised delivery assisted by HWs. There was equal proportion of mothers who needed 30-59 minutes to reach the nearest health facility. In the other hand, about 73% of mothers who needed one hour or more to reach health facility utilised others as delivery assistant. Perceived quality of service to nearby health facility by mothers was also significantly associated with utilisation of HWs as delivery attendant (p value <0.05). About two third of mothers perceiving good quality of service at local health facility utilised HWs as delivery attendant while, it was only 44% among mothers perceiving poor quality of services.

Conclusions: There should be adequate planning and preparation at all levels of health facilities; implementing a new program should not adversely affect another existing service delivery system. For the optional implementation, hospital organogram should be revised; and physical facilities and the low-risk birthing-centers with referral linkages should be expanded.

Keywords: Impact, Incentive, Maternity, Safe-delivery, System research

INTRODUCTION

Direct payments to users, through demand-side financing and providers, performance based supply side payments, through of health services forms an important ingredient of attempts to increase the up-take of health services and promote universal health coverage in low resource settings. Payments have had some success in incentivizing service delivery although evidence on their cost-effectiveness is mixed.¹

Against a background of low use of services and high maternal mortality, the Nepalese Government has sought to incentivize maternal health services. The mechanisms introduced with strong political backing focus on stimulating the uptake of institutional delivery services. They combine a conditional cash transfer (demand-side payments) for all women that deliver in a facility with performance-based supply side payments to create additional capacity to deliver quality services.

We make use of four rounds of the Nepal Demographic and Health Survey (NDHS) to review their impact 10 years on.

The article is structured as follows. In the next section, we describe the evolution of the scheme and published evidence on impact. The third and fourth sections describe the methods used and present findings. The final section discusses the implications of the findings for the future of the scheme.

Incentivizing safe deliveries

In 2005, the Government of Nepal introduced the Maternity Incentives Scheme to increase the use of professional care at childbirth and provide each woman who delivers in a health institution a fixed amount of money to cover transportation costs, based on ecological region.² Thus, women in the mountainous, hilly, and plain Tarai regions receive 1,500, 1,000, and 500 Nepalese rupees (NRPs) (1 US\$ ≈ NRP 96 in August 2013), respectively, for each birth that takes place in a health institution.³

In January 2009, the Aama programme was implemented which made delivery care free across the country (Family Health Division 2009). Aama set a fixed reimbursement for various categories of de-livery and complication differentiated by size of facility. Non-government facilities receiving accreditation from the Ministry of Health and Population receive the same level of reimbursement.⁴

Several studies have looked at the impact of the MIS and SDIP schemes. Early evidence suggested that their implementation was slow with much variation across districts due to ignorance of schemes and delays with central level fund release.⁵

METHODS

Study setting

Our study focused on the mid- and far-western regions of Nepal because their utilization of SBA services is lower compared to other regions.⁶

The study was conducted in Surkhet district of Nepal. Surkhet is a hilly district and is head-quarter of mid-western development region of Nepal. There is one hospital, 5 PHCCs, 9 HPs and 38 SHPs serving 288,527 people in the district. The delivery by trained health worker in the district is 31.8% in 2005/06 which has increased about two times for two years. Surkhet is one of the districts monitoring the process indicators for safe motherhood programme in Nepal. Birth preparedness package programme has been implementing in the district from this year. The study population were the mothers within the age group of 15 to 49 years in Surkhet district. The sampling frame of the study was the mothers who had delivered the baby within 12 months preceding the survey.

The unit of analysis of the research was the mothers with a child less than 12 months of age at the time of survey.

The proportion of birth assisted by health worker in Surkhet is 31.8%. The sample size of the study was calculated as:

Proportion of delivery assisted by health worker (P) = 0.32 Q= 1-P = 0.68, L= allowable error = 15% of P.

Sample size

$$n = \frac{z^2 PQ}{L^2}$$
$$= 363$$

Total samples included in the study were 410 mothers.

Among 5 PHCCs, Dasarapur and Mahelkuna PHCCs and among municipal wards, 5, 7 and 8 were selected randomly in the district.

Among the catchment VDCs of each PHCC, two VDCs were selected purposively. The purposively selected catchment VDCs of Dasarapur PHCC were Dasarapur and Ramghat VDCs and of Mahelkuna PHCC were Mahelkuna and Dahachaur VDCs.

Samples were selected randomly by following the direction shown by neck of a bottle, which was moved freely at the administrative centre of the VDCs and municipal wards.

The following numbers of samples were selected from the VDCs and municipal wards:

Table 1: Sample from VDCs and municipality.

VDC/Municipality	Sample	%
Dasaratpur VDC	52	12.7
Ramghat VDC	68	16.6
Mahelkuna VDC	81	19.8
Dahachaur VDC	44	10.7
Birendranagar municipality ward no. 5	50	12.2
Birendranagar municipality ward no. 7	52	12.7
Birendranagar municipality ward no. 8	63	15.4
Total	410	100

RESULTS

Background characteristics

The background characteristics of the study include age group, caste, place of residence and parity of the respondent. Table 2 shows that the majority of the respondents were of age group 20-24 years followed by 25-29 years in the study. The mean and standard deviation of age were 23.01 and 4.25 years respectively. More than 43% were Brahman/Chhetri and about 28% were Janjati and Dalit each.

Regarding place of residence, 59.8% were from rural area. Similarly, the highest proportion (41%) of respondents were of parity 1 followed by parity 2. The

respondents having 4 or more parities were least in proportion.

Socioeconomic characteristics

Table 2 shows that 39.3% of respondents had tin followed by cement/concrete as their roof type. Similarly, 29.8% of them had toilet with septic tank, 26.3% had pit latrine, however, 19.8% of them had no toilet facility. The mean and standard deviation of weighted poverty scores were 6.52 and 2.89, respectively.

Regarding respondents' education, 20.2% had no formal education, 34.9% had primary education, while only 15.9% had higher education. However, only 4% of respondents' husbands were not educated formally, while 24.4% were higher educated. Majority of the respondents were involved in informal occupation like household work and agriculture. Only 16.1% of them had office work.

Association of socioeconomic factors and utilising delivery assisted by SBAs

There was significant association between socioeconomic status of respondents and utilisation of delivery assistance by HWs (p value <0.001). About one third mothers, having 0-5 poverty score, utilised delivery assisted by HWs, while about three fourth of them having more than 5 score utilised HWs as delivery assistant.

Table 2: Association of socioeconomic characteristics and utilisation of delivery assisted by SBA.

Variables	Assistance during delivery		Chi-square	P value
	HWs n (%)	Others n (%)		
Poverty score				
0-5 score	42 (34.1)	81 (65.9)	58.79	<0.001
>5 score	213 (74.2)	74 (25.8)		
Education of mother				
No education	28 (33.7)	55 (66.3)	84.28	<0.001
Primary	69 (48.3)	74 (51.7)		
Secondary or higher	158 (85.9)	26 (14.1)		
Education of husband				
No education	6 (37.5)	10 (62.5)	47.15	<0.001
Primary	56 (41.2)	80 (58.8)		
Secondary or higher	193 (74.8)	65 (25.2)		
Occupation				
Agriculture	59 (46.8)	67 (53.2)	25.77	<0.001
Housewife	114 (64.7)	77 (35.3)		
Office work	55 (83.3)	11 (16.7)		

Association of both education of mother and her husband were statistically significant with utilisation of assistance during delivery (p value <0.001). Delivery assisted by HWs increased with increase in education level of both

mother and her husband. Higher educated mothers utilised HWs as delivery assistant more than that of higher educated husband. Among higher educated mothers, about 85% utilised delivery assisted by HWs,

while it was about 75% for higher educated husband. Occupation of mother was also significantly associated with utilisation of delivery by HWs. Mother having office work utilised about 5 times higher HWs than others as their delivery assistant.

Association of health facility factors and utilisation of delivery assisted by HWs

Table 3 shows that distance to health facility was significantly associated with utilisation of delivery attendant (p value <0.001). The mothers with less travelling time to reach health facility were more likely to utilise HWs as delivery attendant. About three fourth mothers who needed less than half an hour utilised delivery assisted by HWs. There was equal proportion of mothers who needed 30-59 minutes to reach the nearest health facility. In the other hand, about 73% of mothers who needed one hour or more to reach health facility utilised others as delivery assistant.

Perceived quality of service to nearby health facility by mothers was also significantly associated with utilisation of HWs as delivery attendant (p value <0.05). About two third of mothers perceiving good quality of service at local health facility utilised HWs as delivery attendant

while, it was only 44% among mothers perceiving poor quality of services.

Determining factors for utilisation of delivery assisted by HWs

Determining factors for utilisation of delivery assisted by HWs were identified by multivariate logistic regression analysis. Adjusted odds ratios and their confidence interval of final model of regression are shown in Table 3. In the final model, parity, education of mother, ANC utilisation, birth planning and distance to health facility were significant determining factors for utilisation of delivery conducted by HWs. Factors like caste, socioeconomic status, education of husband, occupation, media exposure, knowledge about SDIP and perceived quality of care, that were statistically significant in Chi-square test, were however, not significant in the final model.

Birth planning was the strongest determinants with mothers having good birth planning, about five times more likely to utilise HWs as delivery assistant compared with those with fair or poor planning (95% CI: 2.74-9.18).

Table 3: Determining factors for utilisation of delivery assisted by HWs: unadjusted and adjusted odds ratios and confidence intervals.

Determinants	Unadjusted OR	95% CI	Adjusted OR*	95% CI*	P value
Parity					
Multiparous	1		1		
Primiparous	5.21	3.24-8.35	4.02	2.27-7.14	<0.001
Education of mother					
No education or primary	1		1		
Secondary or higher	8.08	4.94-13.21	3.58	2.01-6.36	<0.001
ANC utilisation					
No ANC	1		1		
At least one	11.02	4.16-29.23	4.78	1.53-15.00	0.007
Knowledge on SDIP					
Poor or fair knowledge	1		1		
Good knowledge	4.26	2.72-6.69	1.66	0.94-2.93	0.08
Birth planning					
Poor or fair planning	1		1		
Good planning	6.91	4.13-11.55	5.01	2.74-9.18	<0.001
Distance to health facility					
30 minutes or higher	1		1		
<30 minutes	4.02	2.63-6.14	3.07	1.78-5.29	<0.001

* adjusted for all other variables in the multivariate model

Parity and education of mother were also important determinants. Primiparous mothers were about four times more likely to utilise delivery by HWs than multiparous (95% CI: 2.27-7.14). Mothers having secondary or higher education were about 3.6 times more likely to utilise

delivery by HWs than that of below secondary educated counterparts (95% CI: 2.01-6.36).

Mothers having at least one ANC were about 4.8 times more likely to utilise delivery by HWs than those with no ANC (95% CI: 1.53-15.00). Similarly, distance to health

facility was also important factor to utilising delivery assisted by HWs. The mothers who need less than 30 minutes to reach the nearest health facility were about 3 times more likely to utilise delivery by HWs than that of mothers who need 30 minutes or more.

Knowledge on SDIP was not significant determining factor for utilising delivery by HWs at 95% CI (P value 0.08). However, the factor was significantly associated with utilisation of delivery assisted by HWs in 90% CI (OR 1.66, 90% CI: 1.03-2.68).

DISCUSSION

The objective of the study was to identify factors determining the utilisation of delivery assisted by HWs in Surkhet district. Using cross-sectional and quantitative methods, the study identified socioeconomic, demand side and health facility factors determining the utilisation of HWs as delivery assistant in the district. Several studies were found to have used similar research methods to identify factors determining the utilisation of health facility and trained attendant at birth.^{22,32,34,44}

The MoHP emphasises health facility delivery with assistance by trained health worker as a strategy to ensure safe delivery and referral for complications in order to reduce maternal mortality. SDIP is expected to reduce the economic barrier to accessing services in order to achieve the above goals. In order to ensure availability of SBA, the ministry has the policy to train health workers who are potential SBAs as a short term measure.¹⁶ However, very few health workers had been trained and certified as skilled attendant in the district at the time of survey.

Utilisation of delivery by HWs in the study was about 62.4% which is higher than the national as well as district average.^{4,28} The study included majority of respondents within the half an hour distance from the nearest health facility and more than 40% were from urban areas. The higher geographical accessibility of the respondents compared to the national level could describe why the utilisation of delivery by HWs in the study was higher than the national figure.

Among the respondents, 80% of mothers and 96% of their husbands had at least some formal education, which was higher than the national data of 51% and 77% respectively. Similarly, the ANC utilisation and 4 ANC visits in the study were higher than the national level.²⁸ Though the training on BPP to health workers and FCHVs had just been completed, more than one third mothers had good birth planning.

The background characteristics like caste, place of residence and parity were significantly associated with utilisation of delivery by HWs in Chi-square test. However, parity was only the determining background characteristics adjusting all the confounding variables in multivariate regression analysis. The study identified that

primiparous mothers were about four times more likely to utilise HWs as delivery assistant than multiparous. Other studies in Nepal had identified that multiparous mothers were more likely to deliver at home than that of primiparous.²² A study in Kenya also supports that women having high parity (≥ 5) were more likely to have unassisted delivery. NDHS 2006 also supports the finding that there was increase in utilisation of delivery by HWs with decrease in birth order.⁴ Primiparous mothers may get afraid of delivery, hence seeks HWs for better care. In other hand, multiparous mothers may get experience from their previous child and may perceive the quality of service at health facility is poor. Hence, they are reluctant to seek HWs as delivery assistant.

Though socioeconomic status, education of mother and her husband, occupation were significantly associated with utilisation of delivery by HWs in Chi-square test, education of mother was only determining factor in multivariate logistic regression after adjusting the confounders. Mothers having secondary or higher education were about 3.6 times more likely to utilise HWs than that of primary or not educated mothers. Similar studies in Nepal, Burkina Faso, Botswana and Uganda also found that mothers having higher education utilised more skilled attendant at birth than that of lower education.^{17,22} Low education status is important barrier to utilise HWs during delivery. It was identified that redistributive education policies are determinants for utilisation of skilled birth attendant in developing countries.¹⁶

Socioeconomic status was not determining factor for utilising HWs at birth in the study. However, the finding contradicts with other studies on utilisation of trained HWs as birth attendant.²² However, this study contradicts with them in the situation that it was the study conducted after implementation SDIP in the district. Similar study in Ghana following the availability of free obstetric service identified that women who knew availability of free health service were 4.6 times more likely to utilise HWs during delivery. Knowledge on incentive for delivery at health facility may have encouraged mothers to deliver their babies at health facility, hence utilised HWs during delivery regardless their socioeconomic status. There was evidence of reducing disparity in utilisation of delivery in health facility among poorest and wealthiest group in Ghana after implementing fee exemption policy in deliveries.

In other hand, knowledge on SDIP was significant determining factor for utilizing delivery assisted by HWs in 90% CI. Mothers who had good knowledge on SDIP were 1.7 times more likely to utilise HWs than that of poor or fair knowledge. SDIP has been implementing in the district since 2005.⁶ Local FM and regional Nepal Radio have also aired safe motherhood radio program "Ama" in the district that may contribute on awareness on SDIP.

In the study, with increase in utilisation of ANC, there was more likely to utilise HWs as delivery assistant. Similar studies in Nepal and Tanzania have also identified ANC as the major reason for utilising SBAs at delivery.³⁴ ANC utilisation brought the mothers in contact with HWs. The mothers tended to utilise more ANC if quality of service, counselling and education was made available by the professionals and finally leading to utilisation of delivery assistance by them. ANC therefore is important tool for getting emergency obstetric service though it may not be sufficient to identify the mothers who are in need of obstetric care.

Birth planning was identified as the strongest determining factor for utilisation of HW as delivery assistant in the study (OR 5.01). The mothers having good birth planning were about five times more likely to attend HWs during delivery than those who having poor or fair planning. The finding is coherent with the study in India that identified that at least one birth preparedness was 1.45 times (95% CI 1.30-1.63) more likely to utilise SBA. Similarly, the studies in Tanzania, Burkina Faso and Kenya also identified birth planning was the determining factors for utilising trained attendants.^{24,34} Similar study in Burkina Faso identified that the mothers who saved money for childbirth were significantly associated with utilising assistance of skilled providers (p value 0.05). Women who planned childbirth by saving money and identifying transportation before delivery used access during delivery. Those not planning for delivery beforehand may face barriers ranging from financial to transportation and others for utilising assistance from HWs during delivery.

Distance to health facility was also a determining factor for utilising delivery assisted by HWs. The mothers who need less than 30 minute to reach birthing centre were about 3.1 times more likely to utilise HWs during delivery than those who need more than 30 minutes. Similar study in Nepal identified mothers at less than 1-hour distance were about 8 times more likely to utilise HWs at health facility.²² Similar study in Tanzania and Cambodia also identified distance as major determining factor for utilising HWs during delivery.^{32,34} Geographical accessibility was more important than socioeconomic accessibility in the study. Provision of incentive for transportation in the district may be the reason behind higher importance of geographical access. On the other hand, women having delivery at health facility got equal incentive regardless to the geographical inaccessibility. This non-discriminatory provision may discourage women having more distance to health facility to utilise delivery by HWs. Further research can identify the importance of providing higher incentives to women who have less geographical access to health facility.

Most of the HWs conducted delivery at health facility. There is policy to encourage HWs to conduct delivery even at home by incentive under SDIP, only 13% of the deliveries were conducted by HWs at home.

CONCLUSION

The study concludes that birth planning was the strongest determining factor for utilisation of delivery assisted by HWs. SDIP was an important tool to encourage mothers to utilise delivery by HWs. Similarly, utilisation of ANC was also determining factor for utilising delivery by HWs.

Geographical inaccessibility to health facility was barrier to utilise delivery assisted by HWs. Though economic barrier seems to be decreasing due to implementation of SDIP, geographical barrier was still hindering utilisation of delivery services by HWs.

Maternal education above primary level was effective to utilise delivery by HWs. Similarly, parity of mother was also determining factor for utilising delivery by HWs. Mothers having low parity were more likely to utilise HWs.

Knowledge on SDIP was associated with utilising HWs during delivery. About one third mothers didn't know for whom and how much incentive was provided by health facility for institutional delivery. It is therefore recommended that awareness activities on SDIP should be strengthened to increase demand for utilisation of delivery by HWs.

Though economic barrier to utilisation of delivery services by HWs seems to diminish following the implementation of SDIP, geographical barrier still seems pertinent. Further study to explore the possibility of providing discriminative incentives on the basis of distance to health facility to reduce geographical barrier for utilising delivery by health workers may be helpful.

ACKNOWLEDGEMENTS

Acknowledgements are due to staffs of Nepalgunj Medical College, staffs of health facilities and mothers of children of less than 12 months who participated in the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Shah S, Simoes JAR. Determinants of skilled birth attendants in Nepal. A case of Surkhet district. *Int J Community Med Public Health* 2022;9:1684-91.