Original research article

"Factors influencing the Use of Skilled Delivery Services among Women in Beni Township (Democratic Republic of Congo)"

ABSTRACT

This is a descriptive and analytical cross-sectional study whose objective was to establish the factors influencing the use of skilled delivery services among women in the town of Beni in the Democratic Republic of Congo. The population consisted of women of childbearing age (15-49 years) and a sample of 400 was drawn using the Slovin formula. Quantitative and qualitative data were collected using an interview guide. Descriptive, bivariate and multivariate logistic regression analyses were performed at a P-value < 0.05 significance level.

The results revealed that 81.2% of the mothers used a skilled delivery service while 18.8% did not. There were socio-demographic, individual and institutional factors that had a statistically significant association with the use of skilled delivery.

However, after adjustment by the DO ratio, the mother with a high income (DO=2.933, CI=18.333-0.469), the mother whose doctors managed the delivery at the previous delivery (DO=22.244, CI=66.478-7, 443) and those who were satisfied with the previous delivery service by health facilities (DO=26.420, CI=117.895-5.925) have a higher probability of using skilled delivery services among mothers residing in Beni.

Key words: Influencing factors, Services, Skilled delivery, Women.

1. INTRODUCTION

Maternal and child health and family planning require a multisectoral approach to address the high maternal, neonatal and infant mortality rates in the country [1].

Attendance at antenatal clinics and delivery with the help of trained professionals (doctors and nurses) can lead to marked reductions in maternal morbidity and mortality through early detection and management of potential complications [2].

Antenatal care providers and the quality of services offered play a key role in promoting childbirth in health facilities [3].

In addition, results from a Nepalese study found that a distance of more than one hour to the maternity hospital, low education level, multiparity and antenatal care during pregnancy were associated with an increased risk of home birth [4].

A number of socio-demographic characteristics of the individual affect the underlying tendency to seek care [5]. Good examples are age and maternal parity, which have been repeatedly examined as determinants of health care utilisation [6].

In addition, in many parts of Africa, women's decision-making power is extremely limited, especially in matters of reproduction and sexuality. In this regard, decisions about maternal care are often made by husbands or other family members [7].

Accessibility of health services has been shown to be an important determinant of health service utilisation in developing countries. In most rural areas of Africa, one in three women lives more than five kilometres from the nearest health facility [8]. The scarcity of vehicles, especially in remote areas, and poor road conditions can make it extremely difficult for women to access even relatively close facilities. Walking is the main means of transport, even for working women [9].

In rural Tanzania, for example, 84 per cent of women who gave birth at home intended to give birth in a health facility but did not do so because of distance and lack of transport [10].

Fees reduce women's use of maternal health services and prevent millions of women from giving birth in hospital or seeking care even when complications arise.

These costs can include transportation, drugs, food or accommodation for the woman or for family members who help care for her in hospital [11].

The Democratic Republic of Congo has one of the highest maternal mortality rates in the world, according to UNFPA. The maternal mortality rate is 670 deaths per 100,000 live births. The magnitude of maternal mortality in DR Congo was related to the use of skilled birth attendants, as most deliveries were not performed by experts [12]. A situational analysis in DR Congo showed that women do not have enough freedom to express their concerns and questions about health service delivery and health provider behaviour. The interaction between community health workers and the health committee was medical and lacked community perspectives and feedback. The analysis also showed that the health authorities do not optimally supervise community participation activities [13].

The case of maternal deaths is not negligible in the Province of North Kivu, especially in the health district of Beni- ville. The most recent statistics from the Beni health district highlight the fact that in 2017, recorded maternal deaths increased to 13 cases per 100,000 live births.

Therefore, there is a strong case for improving the use of maternal health services in Beni town. It is therefore important to study the factors influencing the use of skilled birth attendance in Beni:

- What proportion of women of childbearing age use skilled delivery services in the town of Beni, DR Congo?
- What are the socio-demographic, individual and institutional factors that influence the use of skilled delivery services?

Based on the above and on the questions in the problematic, the objective of this study is to establish the factors influencing the use of skilled delivery services among women in the town of Beni in the Democratic Republic of Congo.

2. METHODOLOGY

This is a descriptive and analytical cross-sectional study on a population of women of childbearing age (15-49 years) in the town of Beni numbering 91,138 (Rapport Zone de Santé, 2017).

The sample size was determined using the Slovin formula: $n = \frac{N}{1+N\,(0{,}05)^2}$ which gives 398 rounded to 400 women.

We used stratified random sampling, considering each of the four municipalities of Beni ville as a stratum. In each stratum, systematic sampling with the interval of 10 households led us to survey 400 women of childbearing age (15-49 years) constituting our sample and included in the selection criteria.

Included were all women of childbearing age ranging from 15-49 years, who had given birth to at least one child before and currently in the town of Beni at the time of the interview and who had given informed consent. Any woman of childbearing age who had never given birth before was excluded.

Table 1: Distribution of the sample according to strata

Municipality	**Population**	**Sample**
Bungulu	19,803	87
Ruwenzori	20,800	91
Beu	24,235	106
Mulekera	26,300	116
Total	**91,138**	**400**

Both quantitative and qualitative data collection methods were used. A structured interview guide was used to collect the data, consisting of four sections of closed questions. Section A dealt with socio-demographic characteristics, section B with individual factors, and section C with institutional factors, and section D with skilled delivery services.

The data collected was analysed using SPSS (Statistical Package for Social Sciences version 22.0). Statistical calculations were performed using bivariate descriptive analysis and multivariate logistic regression. Some of the results were presented in statistical tables. Bivariate analysis was performed using Chi-square to establish the relationship between the

independent variables and the dependent variable at an alpha level of 0.05, and then multivariate logistic regression was used to determine the significant factors (those with a p-value less than 0.05).

3. RESULTS

3.1 Degree of use of Skilled Delivery Services

Table 2: Use of skilled delivery care

Degree of use	**Frequency**	**%**
Have used	325	81.2
Didn't use	75	18.8
Total	**400**	**100**

This table highlights the proportion of skilled birth attendances by the mother of childbearing age. Based on questions assessing the use of skilled birth care, the survey results show that in a random sample of 400 mothers of childbearing age 325 (81.3%) used skilled birth care, 75 (18.8%) did not use skilled birth care services. Thus, in general, the majority of mothers of childbearing age have a high level of use of skilled birth care services. While the ideal of using a health service is 100%, in the town of Beni there is a gap of 18.8%.

3.2 Socio-demographic characteristics of women

Table 3: Socio-demographic characteristics of women according to use of skilled delivery services

Variables	**Categories**	**Have used**	**Didn't use**	χ^2	**P-value**
Age				2.779	0.249
	15-25	110(85.3)	19(14.7)		
	26-40	136(81)	32(19)		
	41-49	79(76.7)	24(23.3)		
Religion				0.547	0.761
	Muslm	53(82.8)	11(17.2)		
	Protestant	107(79.3)	28(20.7)		
	Catholic	165(82.1)	36(17.9)		
Educational level				4.047	0.256
	Primary	91(85)	16(15)		
	Secondary	168(77.8)	48(22.2)		
	Higher	63(86.3)	10(13.7)		
	Illiterate	3(75)	1(25)		
Marital status				8.383	0.079
	Single	32(72.7)	12(27.3)		
	Widowed	33(75)	11(25)		
	Cohabiting	14(66.7)	7(33.3)		

	Married Divorced	230(84.3) 15(88.2)	43(15.7) 2(11.8)		
Average income	< 50 $ > 50-100 $ 100 $ and more	260(83.3) 33(67.3) 32(82.1)	52(16.7) 16(32.7) 7(17.9)	7.122	**0.028**
Résidencial	Proximity to the health centre Far from the health centre	163(84.5) 162(78.3)	30(15.5) 45(21.7)	2.516	0.113
Number of births	1 2 3 4 and more	67(84.8) 42(70) 89(84.8) 127(81.4)	12(15.2) 18(30) 16(15.2) 29(18.6)	6.495	0.090
Employment	Salaried employee Self-employed Unemployed	70(87.5) 114(83.2) 141(77.0)	10(12.5) 23(16.8) 42(23)	4.517	0.104
Spousal support	Yes No	268(83.8) 57(71.2)	52(16.2) 23(28.8)	6.564	**0.010**
Family's economic status	Rich Medium Poor	32(82.1) 33(67.3) 260(83.3)	7(17.9) 16(32.7) 52(16.7)	7.122	**0.028**

The socio-demographic factors that have a statistically significant association with the use of skilled delivery are: income (χ^2 = 7.122, p-value = 0.028), spousal support during skilled delivery (χ^2 = 6.564, p-value = 0.010), and family economic status (χ^2 = 7.122, p-value = 0.028).

3.3 Individual factors influencing the use of skilled delivery services in Beni Township

Table 4: Individual factors vs. use of skilled delivery services

Variables	**Categories**	**Have used**	**Didn't use**	χ^2	**P-value**
Childbirth care	Yes No	268(83.8) 57(71.2)	52(16.2) 23(28.8)	6.564	**0.010**
Ultrasound use by nurses				0.655	0.418

	Yes No	307(81.6) 18(75)	6(25) 69(18.4)		
BP measurement before delivery	Yes No	295(81.9) 30(75)	65(18.1) 10(25)	1.140	0.286
Best method of safe care delivery	Caesarean section Normal delivery Both	31(77.5) 246(80.4) 48(88.9)	9(22.5) 60(19.6) 6(11.1)	2.585	0.275
Essential to have professionally assisted childbirth	Yes No	216 (80.6) 109 (82.6)	52 (19.4) 23 (17.4)	0.227	0.634
Supervision and follow-up of the delivery by health professionals are secure	Agree Neutral Disagree	257 (85.4) 52 (72.2) 16 (59.3)	44 (14.6) 20 (27.8) 11 (40.7)	15.796	**0.000**
Birth by non-professionals is safe	Yes No I don't know	157 (85.8) 63 (76.8) 105 (77.8)	26 (14.2) 19 (23.2) 30 (22.2)	4.599	0.100
Cultural support in finding skilled birth attendants	Yes No I don't know	236 (82.2) 69 (75.8) 20 (90.9)	51 (17.8) 22 (24.2) 2 (9.1)	3.287	0.193
Religious support in finding skilled birth attendants	Yes No I don't know	312 (83.8) 9 (47.4) 4 (66.7)	63(16.8) 10 (52.6) 2 (33.3)	16.091	**0.00000**
Reasons for not attending health facilities	Lack of time Transport problems Lack of money Not necessary Bad attitude of providers	41 (87.2) 25 (69.4) 161 (78.2) 36 (90) 62 (87.3)	6 (12.8) 11 (30.6) 45 (21.8) 4 (10) 9 (12.7)	9.423	**0.050**
Feelings about the care service you receive	Good Not good No matter	232 (81.4) 29 (78.4) 64 (82.1)	53 (18.6) 8 (21.6) 14 (17.9)	0.238	0.888

Individual factors influencing the use of skilled delivery services in Beni included: care during delivery (χ^2 = 6.564, p-value = 0.010), initiation of initial delivery care (χ^2 = 8.631, p-value = 0.003), supervision and follow-up of delivery by health professionals are safe (χ^2 = 15, 796, p-

value = 0.000), religious support seeking skilled delivery (χ^2 = 16.091, p-value = 0.000), reason for non-attendance at health facilities (χ^2 = 9.432, p-value = 0.051).

3.4 Institutional factors influencing the use of skilled birth attendants in Beni Township

Table 5: Institutional factors vs. use of skilled delivery services

Variables	Categories	Have used	Didn't use	χ^2	P-value
Distance travelled to reach a government health facility for delivery	Less than 30 minutes One hour Two hours More than two hours	221(82.8) 70(77.8) 24(92.3) 10(58.8)	46(17.2) 20(22.2) 2(7.7) 7(41.2)	8.817	**0.000**
Time taken to see medical staff in hospital	Less than 30 minutes One hour Two hours More than two hours	227(86.3) 67(75.3) 24(85.7) 7(35)	36(13.7) 22(24.7) 4(14.3) 13(65)	34.953	**0.000**
Adhering to the standard laws of childbirth care services by the health care provider	Yes No	268(81.5) 57(80.3)	61 (18.5) 14 (19.7)	0.053	0.818
Reception of health workers during childbirth	Good Medial Very bad	222(81.9) 101(82.1) 2(33.3)	49(18.1) 22(17.9) 4(66.7)	9.183	**0.010**
Giving birth where you have already given birth	Yes No	241(81.7) 84(80)	54(18.3) 21 (20)	0.146	0.702
Information on new developments in delivery care services	Yes No	173(82) 152(80.4)	38(18) 37(19.6)	0.161	0.686
Accompanied by qualified personnel during delivery	Yes No	318(85) 7(26.9)	56(15) 19(73.1)	53.873	**0.000**
Staff who attended the delivery at the previous delivery	Doctor Nurse	259(93.8) 66(53.2)	17(6.2) 58(46.8)	92.643	**0.000**
Level of satisfaction during childbirth	Satisfactory Unsatisfactory	91(57.6) 234(96.7)	67(42.4) 8(3.3)	95.924	**0.000**
Wrong experience when childbirth care was	Yes	322(83.6)	63(16.4)	38.378	**0.000**

offered	No	3(20)	12(800		

Distance travelled to reach a health facility for delivery (χ^2 = 8.817, p-value = 0.000), time taken to see medical staff at the hospital (χ^2 = 34.953, p-value = 0.000), reception by health workers during delivery (χ^2 = 9.183, p-value =0.010), assistance by skilled personnel during delivery (χ^2 = 53.873, p-value = 0.000), staff who attended the delivery at the previous delivery (χ^2 = 92.643, p-value = 0.000), level of satisfaction at delivery (χ^2 = 95.924, p-value = 0.000) and bad experience at delivery (χ^2 = 38.378, p-value = 0.000) were the institutional factors influencing the use of skilled delivery services in Beni ville.

3.5 Multivariate analysis

Table 6: Multivariate analysis to determine the main determinant of the use of skilled delivery services

Variables	**Categories**	**Odd ratio (OR)**	**P-value**	**CI 95% (Lower-upper)**
Income	More than 100 $	2.933	0.028	0.47 - 18.33
Staff who attended the delivery at the previous delivery	Doctor	22.244	0.000	7.44 - 66.48
Satisfaction with previous delivery service Satisfied	Satisfied	26.420	0.000	5.93 - 117.90

On multivariate analysis, high income (More than $100 per month) (OR= 2.93, CI =0.47 - 18.33), mother whose doctors managed the delivery at the previous delivery (OR= 22.244, CI =66.478-7, 443) and mothers who were satisfied with the previous delivery service by health facilities (OR=26.420, CI=117.895-5.925) have a higher likelihood of using skilled delivery services among mothers in the city of Beni.

4. DISCUSSION

4.1 Use of skilled delivery services among mothers in Beni Township, DRC

Based on the questions assessing the use of skilled delivery, the survey results show that in a random sample of 400 mothers of reproductive age who gave birth to at least one child, 325 (81.3%) used skilled delivery, 75 (18.8%) did not use skilled delivery services, indicating that 8 out of 10 mothers used skilled delivery services. Overall, the majority of mothers of childbearing age used skilled delivery services. While the ideal of using a health service is 100%, in Beni town there is a gap of 18.8%. These results are in line with those of Abel Ntambue et al, conducted in 2012, aimed at the determinant of maternal health service utilization in urban areas of the Democratic Republic of Congo, a case study in the city of Lubumbashi, in their study they found that maternal health care utilization services varied; 92.6% of women had at least one antenatal consultation, 93.8% of women gave birth in a health facility, 97.2% gave birth in the presence of a qualified health worker, while the caesarean

section rate was 4.5%. Only 34.6% of postnatal women had attended antenatal care 42 days after delivery [14].

Furthermore, this result is in contradiction with a study by Heidi Reynolds, Emelita Wong, Heidi Tucker in 2006, which found that many women reported that they no longer had to give birth in a health centre if the pregnancy was considered normal during antenatal visits [15]. Similar results were obtained in Bangladesh by Gabrysch S, Campbell O. in 2009 and were obtained in Bangladesh where the authors demonstrated that a woman who has had complications is three times more likely to have an unskilled delivery [16].

It is important to participate in skilled birth attendance as it increases the chances of successful deliveries, reduces complications at delivery, improves the safety of mother and child and also reduces the burden of illness resulting from childbirth. It also reduces the economic and social burden of childbirth problems.

4.2 Socio-demographic factors influencing the use of skilled delivery services among mothers in Beni Township, DR Congo

Income (χ^2= 7.122, p-value=0.028), spousal support during skilled delivery (χ^2= 6.564, p-value=0.010) and family history (χ^2= 7.122, p-value=0.028) are the socio-demographic factors that have a statistically significant association with the use of skilled delivery. However, mothers with high income have a higher probability of using skilled delivery services among mothers in Beni town, with expert assistance, the results are consistent with those that found that use of skilled delivery services was significantly associated with spouse's education level, woman's age and women's knowledge of warning signs during pregnancy [16]. This reflects the importance of socio-demographic characteristics in influencing the choice of skilled delivery. Another study by Magadi M., Madise N. and Diamond I. [11]. shows with logistic regression analysis that the level of education of the mother and the spouse increases the chances of using skilled delivery services. This analysis allows us to confirm our hypothesis that there is a significant relationship between socio-demographic characteristics and the level of utilization of skilled delivery services. The above results show that when designing methods to improve skilled delivery services, the socio-demographic characteristics of mothers should be taken into consideration. Measures to overcome socio-demographic characteristics that impede utilization should be considered.

4.3 Individual factors influencing the use of skilled delivery services among mothers in Beni Township, DR Congo

From the analysis, the individual factors that have a significant relationship with skilled delivery are care during delivery (χ^2= 6.564, p-value=0.010), the onset of initial delivery care (χ^2= 8.631, p-value=0.003), the supervision and follow-up of delivery by health professionals are safe (χ^2= 15.796, p-value=0.000), religious support for seeking skilled delivery (χ^2= 16, 091, p-value=0.000), reasons for not attending health services (χ^2= 9.432, p-value=0.051) as not all individual factors influencing the use of skilled delivery services in the town of Beni, DRC were available at health facilities. These results are consistent with those of Markos Mezmur et

al [17] in their study of individual, family and contextual factors associated with skilled delivery care in Ethiopia. Women living in households with moderate and high access to media increased the odds of receiving delivery assistance from a skilled health worker in 2005, and 43% in 2011. Having access to modern media information influences women's knowledge about health care needs during pregnancy and the availability of these services. This is particularly true in a society marked by popular or unscientific health beliefs, limited exposure to modern health services and the resulting sceptical cultural attitude towards modern medical care, and the relatively high reliance on the response to illness in seeking care.

According to the same study, the results were that older women in Ethiopia were more likely to have skilled assistance during childbirth, which could be attributed to better knowledge of the availability and accessibility of these services. Older women also tended to have more experience with maternal health care than younger women.

4.4 Institutional factors influencing the use of skilled delivery services among mothers in Beni Township, DR Congo

The results revealed that the distance travelled before reaching a health centre for delivery (χ^2= 8.817, p-value = 0.000), the time taken to see a medical staff at the hospital (χ^2 = 34.953, p-value = 0.000) the reception of health workers during delivery (χ^2= 9.183, p-value =0.010), assistance by qualified personnel during delivery (χ^2= 53.873, p-value = 0.000), the personnel who attended the delivery during the previous delivery (χ^2= 92.643, p-value = 0.000) Satisfaction with delivery and poor delivery experience (χ^2 = 95.924, p-value = 0.000) were the institutional factors influencing the use of skilled delivery services in Beni town. However, the mother whose doctors managed the delivery at the previous delivery and the mother who was satisfied with the previous delivery service by the health facilities had a higher probability of using skilled delivery services among mothers in Beni town. These findings are in line with those of Lydia Feistein et al in 2014 in their study of antenatal and delivery services in Kinshasa in the Democratic Republic of Congo which show that reasons for choosing a health facility included reputation, friendly/accessible staff, availability of comprehensive services, access to medicines, location and cost [18]. Most women reported satisfactory treatment by staff, but 47% reported that the antenatal care provider ignored their complaints, 23% had difficulty understanding answers to their questions, 22% wanted more time with the provider, 21% wanted more privacy and 12% felt uncomfortable asking questions. However, it was found that among the institutional factors; health education; distance to a hospital; and means of transport influenced the level of use of skilled delivery services. Activities ranging from time in hospital to distance from hospital, attitude of health workers, facilities provided, etc. should be provided with the minimum comfort required.

CONCLUSION

To establish the factors influencing the use of skilled delivery services among women in the town of Beni in the Democratic Republic of Congo is the objective of the study which involved 400 women.

In view of these results, we suggest the following:

- The socio-economic status of the mother must be improved in order to facilitate her participation in skilled birth attendance. Socio-economic activities such as employment opportunities, skills empowerment, training, soft loans for businesses are among those that can be focused on. This will enable them to manage the financial implication, objective with skilled delivery and strengthen their mobilisation.

- Health education in the community should be promoted through various available channels and means. This will enable women to become familiar with the knowledge about skilled birth, its importance and what it entails. Educating them will enable them to take ownership of the service and actively participate in it.

- Strengthening the health institutions that provide skilled delivery services is necessary, providing all the necessary tools, improving the infrastructure, motivating the responsiveness of health workers to skilled delivery. This will enable health workers to provide quality services and thus encourage women's participation.

- The provision of community mobilisation devices such as ambulance, emergency call unit number, mobile application, etc., will enhance the mobilisation of women and their families. This will enhance the mobilisation of mothers for skilled delivery.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline written and informed respondents' consent and ethical approval has been collected and preserved by the authors.

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