DETERMINANTS ON THE UTILIZATION OF INSTITUTIONAL DELIVERY IN RURAL AREAS OF MYAING TOWNSHIP, MAGWAY REGION, MYANMAR

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Abstract

Background: Institutional delivery is one of the most important interventions to reduce maternal and neonatal mortality, especially in low and middle-income countries. Increased maternal and neonatal mortality has a huge impact on the health and socio-economic status of families and society.

Aim: This study aimed to assess the utilization of institutional delivery among women of reproductive age in a rural area of Myanmar and explore its determinants.

Methods: A community-based cross-sectional study was carried out among 286 women aged 15–49 years with delivery in the year prior to the survey in Myaing township, Central Myanmar region, 2017.

Results: About two-thirds of the participants (60.1%, 95%CI: 55.6-65.9) utilized institutional delivery. Over three-quarters of the participants took antenatal (AN) care from a rural health centre and 73.8% from a midwife. In logistic regression analysis, adjusted for potential confounders, the odds of utilizing institutional delivery were four times for persons who took AN care with skilled birth attendants (OR 4.23; 95%CI 1.37, 13.10), over three times for those with low parity (OR 3.61; 95%CI 2.02, 6.46), and 1.83 times in those who could access labour room service easily (OR 1.83; 95%CI 1.10, 3.04) and in those living near to a health centre (OR 1.77; 95%CI 1.13, 2.98).

Conclusion: Even though the proportion of institutional delivery was higher than in other studies, health facility delivery still needs to be promoted to cover all childbirths. Taking AN care with skilled birth attendants should be made a priority to promote the utilization of institutional delivery.

Keywords: *Place of delivery, Institutional delivery, Rural areas, Myanmar*

Introduction

Improving maternal and child health is essential for achieving the health-related goals and targets of both the Millennium Development Goals (MDGs) and Sustainable Development Goals. Although many countries have shown achievements regarding MDGs, maternal and neonatal deaths are still high in low- and middle-income countries, particularly in the rural areas (1). Most obstetric complications contributing to death are common during the intrapartum period and their occurrence is unpredictable; therefore, delivery at facilities, institutional delivery, is important to reduce maternal and child death (2,3).

Institutional delivery means giving birth in a medical institution under the overall supervision of trained and competent health personnel where there are more amenities available to handle the situation and save the lives of the mother and the child (4). Institutional delivery is recommended by the World Health Organization (WHO), but its rate is low. The use of women's health facilities in childbirth is a complex phenomenon and is influenced by many factors such as country contexts, community factors, health service factors, household factors, and maternal factors. The Myanmar Demographic and Health Survey, 2015-16 (MDHS) reported that inadequate availability of healthcare, large socio-economic differences, geographic regions, social factors, education level, etc., are related to maternal healthcare utilization (5).

Myanmar is one of the countries with an unacceptably high maternal mortality. According to MDHS (2015-2016), the maternal mortality ratio was 227 maternal deaths per 100,000 live births. At the national level, 60% of the births were delivered by a skilled provider and only 37% were delivered in a health facility. Institutional delivery was higher in urban areas (70%) than in rural areas (28%) (5). Importantly, low socio-economic level and difficult geographic conditions can lead to low institutional delivery and high maternal deaths. Therefore, the objectives of this study were to assess the utilization of institutional delivery among women in reproductive age in rural areas of Myaing Township, Magway Region, Myanmar, and explore the determinants of institutional delivery.

Methods

Study design and setting

A community-based cross-sectional study was conducted among 286 reproductive age women in the rural areas of Myaing Township, Magway Region, during the period of September to November 2017. Magway Region is one of the central plain regions of Myanmar and had the third-highest maternal mortality ratio and first highest infant mortality rate in the Union in 2014: maternal mortality ratio of 344 per 100,000 live births, and infant mortality rate of 94 per 1,000 live births (6).

Study participants

The participants were 15-49 years old ever-married women who gave birth during the last one year and lived permanently in the study township. Those who had mental problems were excluded. The sample size was calculated using the precision formula considering 28% institutional delivery of rural population according to MDHS, 2015-16 (6) with 95% confidence interval precision of ±7%. To adjust for a design effect of 1.5 and a 10% non-response rate, at least 266 women were required.

Sampling methods

From nine health facilities (two station hospitals and seven rural health centres) in Myaing Township, three health facilities were selected randomly. Thirty- two participants were selected by a simple random sampling method from the sampling frame of each health centre. A list of reproductive age women was received with the help of the local authority which was regularly updated annually.

Ethical approval

The study was approved by the Institutional Technical and Ethical Review Board (ITERB) of the University of Public Health (Yangon) with

Certificate of Approval No: ITERB (2017/MPH/46). Confidentiality of collected information was strictly maintained.

Data collection
The participants were interviewed face-to-face at their home using a pre-tested semi-structured questionnaire by five trained interviewers who were trained for three days before the data collection process. The participants were given an explanation of the purpose, procedures and possible benefits and risks of the study. After that, a written informed consent for participation was obtained from each participant.

Variables
The outcome variable of this study was the utilization of institutional delivery. The independent variables were divided into three subgroups (socio-demographic factors, obstetric factors, and health service factors). Four socio-demographic factors (age, education, occupation and monthly family income), four obstetric factors (number of parity, age of mother at last childbirth, number of AN care and type of AN care provider) and three health service factors (availability of labour room service, distance to reach the nearest health centre and mode of travel to this centre) were included. Education level was categorized into four groups: no education (illiterate and only read and write), primary education (less than primary school completed 1-5 years), secondary education (secondary school completed 6-9 years) and above secondary education (10-11 years of schooling, university level, graduate and post-graduate). The monthly family income was categorized into two groups according to the median value of income (US$ 100/month).

Data management and analysis
Epidata software V.3.1 was used for data entry, whereas data management and statistical analysis were performed by using STATA/IC V.14.0 (StataCorp, College Station, Texas 77845 USA). To identify the determinants of utilization of institutional delivery, odds ratios and 95% CI were estimated by multivariate logistic regression analyses which were based on the drawing of a directed acyclic graph (DAG). In multivariate logistic regression analysis, finally, a total 284 participants' data were analyzed by excluding two participants who did not take AN care. Potential confounders identified from the DAG: education level, occupation, presence of labour room service, distance and mode of travel to the nearest health centre were controlled for to estimate the total effect of potential exposures on the utilization of institutional delivery. The total effect on the main outcome refers to the overall effect through all the identified causal pathways from potential exposure to the main outcome. According to the DAG, there are four potential exposures: number of parity, type of AN care providers, availability of labour rooms at the nearest health facility and distance to the health centre. For the total effect of type of AN care provider on the utilization of institutional delivery, education, occupation, presence of labour room service, distance and mode of travel to the nearest health centre were controlled for as confounders. For the total effect of the number of parity on the utilization of institutional delivery, the variable of education level was controlled as a confounder. P values <0.05 were considered to indicate statistical significance.

Results
From the total of the 286 participants, 172 (60.1%; 95%CI 55.6%, 65.9%) utilized institutional delivery and most of them (84%) delivered with skilled birth attendants. Table 1 shows that over half of the participants were aged between 25-34 years and half of them had received only primary education. About 15% of the participants were illiterate. Over half of the participants reported working outside the home and about a quarter were farmers and another quarter were manual workers. About two-thirds of the participants replied that they earned 100 USD or less for their monthly family income.

Table 1: Socio-demographic characteristics, Obstetrics history, practice on antenatal care and place of delivery during the last childbirth, Health service related characteristics among the participants (n= 286)

Socio-demographic characteristic	Number of participants /%
Age (years)	
18-24	44 (15.4%)
25-34	159 (55.6%)
35-49	83 (29.0%)
Mean (SD)	31.2 (6.0)
(Range)	(18-48)
Educational status	
No education	42 (14.7%)
Primary Education	142 (49.7%)
Secondary Education	45 (15.7%)
Above Secondary Education	57 (19.9%)
Occupational status	
Housewife	133 (46.5%)
Manual worker	68 (23.8%)
Farmer	67 (23.4%)
Others	18 (6.3%)
Monthly Family income (USD)	
≤ 100	173 (60.5%)
> 100	113 (39.5%)
Median (IQR)	100 (65-130)
Obstetrics history, practice on antenatal care and place of delivery	
Age of mothers at last childbirth (years)	
17-19	7 (2.4%)
20-34	211 (73.8%)
35-47	68 (23.8%)
Mean (SD)	29.7 (5.9)
(Range)	(17-47)
Number of parity (times)	
1	98 (34.3%)
2-4	157 (54.9%)
≥ 5	31 (10.8%)
Mean (SD)	2.4 (1.6)
(Range)	(1-11)
Taking AN care during last child birth	284 (99.3%)
Frequency of AN care (Times) (n=284)	
< 4 times	99 (34.9%)
≥ 4 times	185 (65.1%)
Main AN care provider	
Doctor	53 (18.7%)
Lady health visitor and Nurse	6 (2.1%)
Mid-wife	209 (73.6%)
Auxiliary Mid-wife and Traditional birth attendants	16 (5.6%)
Place of delivery	
Health Facilities/Health Centre	172 (60.1%) 95%CI- (55.6%-65.9%)
Home	114 (39.9%)
Birth attendants	
Doctor	163 (57.0%)
Midwife	78 (27.3%)
Auxiliary Midwife	19 (6.6%)
Traditional birth attendants	26 (9.1%)
Health service related characteristics	
Presence of labour room at the nearest health facility	197 (68.9%)
Distance from health centre (kilometres)	
≤ 3	165 (57.7%)
4 - 8	109 (38.1%)
> 8	12 (4.2%)
Mode of travel	
By motor cycle	236 (82.3%)
On foot	41 (14.6%)
By car	9 (3.1%)

Over half of the participants had experienced two to four births and about 10% of them had five or more deliveries. Most of the participants gave birth to their last child at the age of 20-34 years. All, except two of the participants, took AN care, most (73.8%) from a midwife. About two-thirds of the participants replied that a labour room was present at the nearest health facility and that this facility was located within three kilometers of their residence. Motorcycle was the most commonly used vehicle to reach the nearest health centre.

The associations between the socio-demographic characteristics of participants and the utilization of institutional delivery are presented in Tables 2 and 3. In binary logistic regression, the number of parity, presence of labour rooms at the nearest health facility and distance to this health centre were significantly associated with the utilization of institutional delivery.

Table 2: Distribution of practice on institutional delivery according to socio-demographic characteristics of participants (n=284)

Socio-demographic characteristics	Institutional delivery n, (row %)		Crude OR (95% CI)	p-value*
	Yes	No		
Age (years)				
18-24	28 (63.6%)	16 (36.4%)	1	0.457
25-34	90 (57.3%)	67 (42.7%)	0.77 (0.38-1.54)	
35-48	54 (65.1%)	29 (34.9%)	1.06 (0.50-2.29)	
Educational status				
No education	24 (57.1%)	18 (42.9%)	1	0.093$^\phi$
Primary Education	80 (55.9%)	63 (44.1%)	0.98 (0.49-1.98)	
Secondary Education	29 (63.0%)	17 (37.0%)	1.36 (0.57-3.25)	
Above Secondary Education	39 (68.4%)	18 (31.6%)	1.72 (0.74-4.01)	
Occupational status				
Housewife	76 (57.1%)	57 (42.9%)	1	0.337
Others	96 (61.9%)	59 (38.1%)	1.26 (0.78-2.04)	
Monthly family income (USD)				
≤ 100	101 (57.7%)	74 (42.3%)	1	0.525
> 100	71 (62.8%)	42 (37.2%)	1.17 (0.72-1.91)	
Age of mother at last childbirth (years)				
17-24	33 (64.7%)	18 (35.3%)	1	0.340
25-34	94 (57.0%)	71 (43.0%)	0.72 (0.37-1.39)	
35-47	45 (66.2%)	23 (33.8%)	1.07 (0.50-2.30)	
Number of parity (times)				
1	77 (78.6%)	78 (50.3%)	3.71 (2.03-6.79)	<0.001
2-4	77 (49.7%)	78 (50.3%)	1	
≥ 5	18 (58.1%)	13 (41.9%)	1.40 (0.64-3.07)	
AN care providers				
Nonskilled birth attendants	6 (35.3%)	11 (64.7%)	1	0.052
Skilled birth attendants	166 (61.7%)	103 (38.3%)	2.71 (0.95-7.76)	
Number of AN care				
< 4 times	59 (58.42%)	42 (41.58)	1	0.808
≥ 4 times	113 (61.08%)	72 (38.92)	1.06 (0.64-1.75)	
Presence of labour room at the nearest health facility				
No	45 (50.6%)	44 (49.4%)	1	0.020
Yes	127 (63.8%)	72 (36.2%)	1.83 (1.09-3.06)	
Distance to the health centre (kilometres)				
> 3	62 (51.2%)	59 (48.8%)	1	0.013
≤ 3	110 (65.9%)	57 (34.1%)	1.84 (1.13-3.0)	
Mode of travel				
By motor cycle or car	145 (59.9%)	97 (40.1%)	1	0.593
On foot	27 (64.3%)	15 (35.7%)	1.20 (0.61-2.38)	

*   : Chi-square test ϕ : Chi-square test for trend
[a]   : Fisher Exact value

Table 3: Factors associated with the utilization of institutional delivery among rural reproductive women by binary logistic regression analysis (n=284)

Exposure	Adjustment variables	Level of exposure	Adjusted OR (95% CI)	p-value*
Number of parity (times)	Education	1 2-4 ≥ 5	3.61 (2.02-6.46) 1 1.50 (0.66-3.41)	<0.001
AN care providers	Education, Occupation, Labour room presence, Distance to the nearest health centre, Mode of travel	Non-skilled Skilled	1 4.23 (1.37-13.10)	0.010
Presence of labour room at the nearest health centre		No Yes	1 1.83 (1.10-3.04)	0.020
Distance to the nearest health centre		> 3 kilometres ≤ 3 kilometres	1 1.83 (1.13-2.98)	0.013

*Likelihood Ratio

After adjusting for potential confounders, the total effect of type of AN care provider on the utilization of institutional delivery was increased, and taking AN care with skilled birth attendants was significantly associated with the utilization of institutional delivery (AOR 4.23; 95%CI 1.37, 13.10). Moreover, the odds of utilizing institutional delivery were 3.61 times higher in the persons who had low parity (AOR 3.61; 95%CI 2.02, 6.46) than in those who had a higher parity (2-4 times), 1.83 times in those who could access a labour room service at the nearest health centre (AOR 1.83; 95%CI 1.10, 3.04), and 1.83 times in those who lived within three kilometers of the nearest health centre (AOR 1.83; 95%CI 1.13, 2.98).

Discussion

This study provides the magnitude of the utilization of institutional delivery among reproductive age women in the rural areas of Myaing Township, Magway Region. The main finding of the study is that about two-thirds of the participants utilized institutional delivery.

All of the participants except two took AN care. Furthermore, although almost all of the participants (94.6%) took AN care from skilled birth attendants, only 84% of the participants delivered with skilled birth attendants. Low parity, taking AN care with skilled birth attendants, short distance to the health centre

and easy accessibility to labour room services were associated with the utilization of institutional delivery.

The proportion of women who had health facility delivery (60.1%) was higher than the national MDHS (2015-16), which reported that 28% of rural mothers delivered their child in health facilities (5). In this study, good transportation and availability of labour room service in the nearest health centre were the most reasonable factors for the utilization of institutional delivery.

This differs from the finding of a cohort study in rural Andhra Pradesh, India, in 2012 (36.8%) (7) and also that of a study conducted in the rural areas of the Philippines in 2010 (44.4%) (8).

The difference could be explained by the different characteristics of the study samples and the different nature of the rural areas. However, the World Health Organization recommended that all childbirths should be conducted at a health facility as unpredictable obstetric complications develop in 15–20% of pregnancies, and a major proportion of deaths resulting from these complications occurs either at home or in transit (9). Thus, the proportion of institutional delivery in this study, while quite high, still does not meet the

WHO recommendation and needs to be increased further.

A study done in an urban area of the Chin State, Myanmar, in 2016, found that only one-quarter of the pregnant women (25.7%) used institutional delivery (10) and other studies in the Mon and Rakhine states reported about 46% and 48% institutional delivery in 2012 and 2015 respectively (11,12). The difference may be explained by the different geographic conditions, ethnicities, and accessibility of health facilities.

Regarding the determinants of utilization of institutional delivery, the number of parity, type of AN care provider, distance to the nearest health centre and accessibility of labour room services were associated with the utilization of institutional delivery. The study highlights that with lower birth orders, women are more likely to give birth at a health facility. This is consistent with studies from Ethiopia and the rural areas of India (2,7) which show that the number of parity was consistently associated with institutional delivery. Moreover, a study done in the Philippines mentioned that women with low parities were more likely to use the health facility delivery (8). The most likely reason was that women with more children had no more time to get AN care from the health professionals and so did not get any recommendation for the utilization of institutional delivery. For primipara, the recommendation to deliver at a facility at least for the first childbirth had been received from the health staff.

The participants who took AN care from health professionals were more likely to utilize institutional delivery than those who took prenatal visits with non-health professionals. This finding is in line with the studies using secondary analysis of data from the national MDHS (2015-16), secondary data analysis of the Bangladesh Demographic and Health Survey (BDHS, 2011) and a study in a rural area of North-west Ethiopia, which showed that those who did not take prenatal visits with traditional birth attendants were more likely to use the health facility delivery (3,13,14). It is

very important that when providing AN care, the health staff should refer high-risk pregnancies for delivery at a health facility to reduce the risk of unpredictable intrapartum and postpartum complications.

Moreover, the distance to a nearby health facility and the presence of labour room service in that health centre were found to be significantly associated with institutional delivery. This finding was also supported by other findings from low- and middle-income countries such as Ethiopia and Eritrea and in the national survey of Myanmar (3,13,15). This highlights that long distance to the health facility is a barrier for health service use irrespective of other maternal, obstetric factors.

The main strength of this study was that the total effect on the main outcome was analyzed using a pre-compiled DAG which was based on the literature of studies done in the low and middle-income countries. As for the limitations of the study, generalization was limited since the study was conducted among the reproductive age women in the rural areas of only one township. Information about the health facility delivery for births within the previous one year was obtained by interviews and was therefore dependent on the accuracy of reporting. There may also have been some poor recall memories regarding AN care, such as the number of AN care visits, that may also have introduced some biasness. Moreover, because of the nature of the cross-sectional study, causality could not be established with certainty.

Conclusion
The level of health facility delivery in the rural area of Myaing Township, Magway region, Myanmar, was significantly higher than that revealed by the national data in 2015 to 2016 (5). Women who had a lower parity, took AN care from health professionals, and had access to a health facility within three kilometers, and the presence of labour room service at the nearest health centre, were more likely to deliver in a health facility.

To promote health facility delivery, strong intervention should be targeted on raising women's awareness on the benefits of taking AN care with health professionals and creating easy accessibility of labour room services at health centres. Among these, taking AN care with skilled health professionals was found to be the main factor in promoting the utilization of institutional delivery.

Disclosure of interests
The authors have no conflict of interest to disclose.

Authors' contributions
TDA and AKO conceived and designed the study, developed survey tools, collected and analyzed data and drafted the manuscript. MKK advised in the design of the study, questionnaire development. AFG and TL guided the analysis, interpretation of findings and writing. All authors read, edited and reviewed the manuscript and approved the manuscript for submission.

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