Proximity of Health Facilities and Utilization of Antenatal and Child Health Services in Nepal: Evidences from Western Hill

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Abstract

The main objective of this paper is to examine the impact of proximity of health facilities on utilization of antenatal and child health services in Nepal. The data for the present study has been taken from general health survey 2010, which follows multistage sampling technique. Univariate, bivariate and multivariate statistical techniques have been used to analyze the data. This study follows evaluative operation research technique to assess the effectiveness of health facilities on utilization of services.

The analyses reveal that less than 8.0 percent of households have health facility within the proximity of 30 minutes of walking distance followed by 12.0 percent within the proximity of an hour and remaining 80.0 percent more than an hour walking distance from the usual place of residence. Both (Bivariate and multivariate) analyses clearly reveal that the proximity of facilities is not a statistically significant factor of enhanced use of health services. However, education, mass media exposure and household economic condition are significantly related with utilization of antenatal and child health services.

This study is conclusive that proximity of health facilities without good quality does not matter in the utilization of antenatal and child health services. It is therefore, the concerned authorities should pay their attention towards the quality of services rather than increasing the number of health facilities.

Keywords: Proximity, health facilities, utilization, antenatal and western hill

1. Introduction

Access of health care is a basic human need and necessity of all people and all government should provide social guarantee ensuring the basic needs. However, the government has reduced its budget in public health sectors in the name of structural adjustment programs in developing countries. On the other hand, due to the globalization, open market and liberal economic policies, private sectors have invested a huge sum of money in health related sectors and these facilities are generally centralized to the areas having high rate of return in terms of profit. Therefore, the spatial distribution of health facilities is asymmetric in one hand and expensive in other hand particularly in developing countries. In general, it is supposed that the nearness of health facilities is positively associated with increased use of services among general population.

Health belief model focuses on two aspects of individuals' representation of health and health behavior namely; threat perception and behavioral evaluation. Threat perception is composed of two components, perceived sucesceptibility to illness or health and

perceived severity of consequences, while behavioral evaluation consists two different beliefs; perceived benefits and perceived barriers. Among the perceived barriers, proximity of health facilities is one of the important components of care seeking behavior among general population. Care seeking is not only influenced by threat perception and behavioral evaluation but also other factors such as: demographic (age, class, gender), economic, non economic and psychological (personality and peer group pressure) [3].

A large number of studies reveal that there is strong negative association between accessibility, particularly distance to health facilities and uptake health services at the global level [4, 5, 10, 12]. Andersen's behavioral model also states that geographical proximity (place of residence and distance factor) is one of the significant factors associated with utilization of maternal health particularly antenatal services [2]. However, other several studies argue that proximity is not only a principal determinant but also demographic, socio-economic and non economic, household, health seeking behavior, cultural and religious factors are significant predictors of health service utilization among general population in developing and developed countries as well [3, 4, 14, 24].

An American study made by Billi, Pai and Spahlinger suggests that distance of health facility is a strong predictor of service utilization among American people. The study reveals that the chance of diseases burden is likely to be more than 5.0 times among individuals who are beyond the 30.0 miles from the health facilities as compared to the individual less than 10.0 miles. This paper further reveals that household economic condition (utilization of specific health facilities is 3.1 times likely among users from the household with rich economic condition as compared with poor household economic condition) and severity of health problem are also significantly associated with health service utilization [9].

An Omani study on impact of geographical proximity on health seeking behavior shows that geographical proximity is significantly related to health care for medically acute complications, follow up visits and seeking vaccinations. In addition, marital status (married as compared to unmarried), health education, race and mass media exposure are also significant predictors of health service utilization [1].

However, Schooley, Horan, Lee and West argue that the influence of spatial barriers on utilization of health services can be minimized by adopting special strategies on mass media exposure and information, education and communication. This paper further shows that education (odds ratio is more than 5.0 times for more educated respondents), household economic condition (respondents from rich economic condition are 2.1 times more likely to seek treatment) and ethnicity also play vital role in health service utilization [25].

A wealth of Nepalese literatures also document the negative association between proximity health facilities and care utilization. For example; Nepal Demographic Health Survey 2006 reveals that there is wide variation in health service utilization (maternal and

child health) according to ecological, development regions and place of residence. The survey records that an overwhelming proportion of women in urban areas utilize maternal and child health services as compared to rural areas. The bivariate analyses also present that utilization of maternal and child health services varies significantly by ecological regions, sub-regions and development regions. In addition, age, education and household wealth ranks are also significant factors of health services utilization among general population [20].

KC in his study about treatment seeking behavior of STDs among men in Nepal reveals that accessibility of health facilities is not significantly associated with treatment seeking behavior of STDs. However, education (men with SLC and above education are about 5.0 times more likely to seek the treatment as compared with uneducated men), mass media exposure (odds ratio 5.4 time s) and household economic condition (men from household with rich economic condition are more than 2.0 time likely to seek the treatment of STDs) are significantly associated with treatment seeking behavior of STDs [17].

In Nepalese context, the government has set up one sub-health post in each VDC and one PHC in each electoral constituency for providing free basic health services for the people living in the rural and remote parts of the country after 1990. With the expansion of free basic health care in Nepal, it is essential to know how does the geographical proximity contribute to care seeking behavior of general population. Therefore, the main aim of this paper is to examine the relationship between proximity of health facilities and utilization of antenatal and child health services in western region of Nepal.

2. Data and Methods

The data used in this paper has been taken from a cross sectional survey of poverty and health service utilization in western Nepal carried out in 2010 (from August to November). The author himself managed and conducted the survey to collect the information. The scientific committee of University Grants Commission (UGC) Nepal approved the proposal and provided the funding under the project entitled "Faculty Research Grants". The main aim of the survey was to examine the relationship between poverty and health service utilization among general population in western hill region of the country.

The survey uses multistage and mixture of probability and non probability sampling design. At the first stage, three districts: Kaski from Gandaki, Baglung from Dhaulagiri and Plapa from Lumbini were selected purposively. The rationale for choosing these districts is the representation of three (Gandaki, Baglung and Lumbini) zones from western hill region of western development region (WDR). At the second stage, three urban areas; Pokhara sub-Metropolis from Kaski, Baglung municipality from Baglung and Tribhuvan municipality from Palpa districts were chosen purposively to observe the rural urban differential. But for the rural areas, one village development committee (VDC) from each district (Bharatpokhari from Kaski, Gothadi from Palpa and Boharagaun from Baglung) was selected randomly. At the next stage, wards (lowest

political division of VDC and municipality) were selected randomly as primary sampling units (PSUs) from designated municipalities and VDCs. At the fourth stage, the households in the selected PSUs (wards) were chosen using random sampling. At last, 461 women having at least one child five years preceding to the survey were successfully interviewed.

Data analyses have been performed in three stages using SPSS 13.0 for windows. Firstly, univariate analysis (percentages) has been used. Secondly, bivariate (Chi square test for independence) analysis has been performed to examine the association between utilization of health services and selected background characteristics individually. Thirdly, multivariate analyses (binary logistic regression) have been used to explore the association of geographical vicinity and other confounders with health service utilization. The binary logistic regression model has been used as a multivariate technique because responses are dichotomous (yes or no).

3. Measures

3.1 Response

Measurement of health service utilization is complex and no single indicator is sufficient for mapping its coverage. Therefore, this paper only attempts to include utilization of antenatal and child health services as the measures of health service utilization. As in health service utilization, antenatal health also comprises a large number of components, so this paper only captures whether women receive at least one antenatal check up from skilled health workers during their last pregnancy. To measure this variable, women were asked whether they had received at least one antenatal check up from skilled health workers. Similarly, utilization of child health includes whether children receive health services to solve health related problems. For measuring this variable, mothers were also requested whether any of the children in their family had suffered from any health problems. If yes whether they had sought the treatment to overcome these problems. The responses of these variables have two categories yes (if any of services received during the reference period) or no (none of the services received).

3.2 Predictor

Although a concrete and universal measurement of proximity is not available, this paper assumes proximity as a walking distance between the location of health facilities and respondents' usual place of residence as used by the previous studies at global context [15, 23]. To measure this variable, women were asked how much time did it take to reach the nearest health facilities from their place of residence. For an analytical purpose, this variable has been categorized into three groups: within half an hour, within an hour and more than an hour walking distance. By this measure, less than 8.0 percent of households lie within the proximity of half an hour of walking distance followed by 12.0 percent within the proximity of an hour and remaining 80.0 percent of the households lie more than an hour of walking distance from respondents' usual place of residence.

3.3 Controls

Although the main objective of this paper is to examine the association between proximity of health facilities and utilization of antenatal check up and child health services, this study uses other non spatial factors such as; age, education, households' economic condition, mass media exposure, place of residence, religion, occupation of respondents etc. Among the confounders, household economic condition and mass media exposure are composite measures. The basis of choosing these variables as controls have already been explained.

The household economic condition has been measured by using multidimensional poverty index (it is calculated based on the absence and presence of certain household amenities such as; type of household, toilet facility, source of lighting, main fuel for cooking, source of drinking water, separate room for cooking, ownership of house, ownership of agricultural land, ownership of livestock, ownership of durable goods: car, tractor, moped, scooter, motor cycle, telephone, refrigerator, color TV, bicycle, electric fan, radio, sewing machine, B/W TV, water pump, mattress, chair, cot/bed, table and clock/watch. This method has been extensively used by Macro-International in various demographic health surveys at the global level [16, 21]. This technique assigns weights (based on their relative importance) for the basic household amenities to compute an index. The computational procedure is shown in table 1.

Table 1: Assignments of weights for selected households' amenities

Amenities	Categories	Weight	Amenities	Categories	Weight
Household type	Pacca	4	**Ownership of house**	Yes	2
	Semi Pacca	2		No	0
	Kachha	0	**Own. of livestock**	Yes	2
Toilet facility	Own (Inside)	4		No	0
	Outside	2	**Own. of durable goods**	Car	4
	No toilet	0		Tractor	4
Source of lighting	Electricity	2		Moped	3
	Kerosene/Gas/oil	1		Scooter	3
	Others	0		Motorcycle	3
Main fuel for cooking	Electricity	2		Telephone	3
	LPG/Bio-Gas	2		Refrigerator	3
	Kerosene/ Oil	1		Color TV	3
	Others	0		Bicycle	2
Source drinking water	Pipe/Pump/well	2		Electric Fan	2
	Public Tap/Well	1		Radio	2
	Others	0		Sewing Machine	2
Kitchen	Yes	1		B/W TV	2
	No	0		Water Pump	2
Owned Agr. land	5 Acres or more	4		Mattress	1
	2- 4.9 Acre	3		Chair	1
	Less than 2 Acre	2		Cot/Bed	1
	No Agr. Land	0		Table	1
				Clock/Watch	1

Note: The household economic condition ranges from 8 to 62. The index scores range from 0-14 for a low, 15-24 for a medium and 25-62 for a high economic status.

According to this measure, 28.0 percent of women are from the households with poor economic condition; followed by 37.0 percent from the households with moderate economic condition and remaining 34.7 percent from the household with rich economic condition.

Similarly, mass media exposure is also composite measure, which has been measured by using the responses whether the respondents listen radio daily, read newspapers weekly and watch television daily. This variable has been categorized into four groups: no exposure, exposed to any one, exposed to any two and exposed to all three media. Based on this classification, more than 13.0 percent of women exposed to no media, while 15.6 percent, followed by 22.3 and 48.6 percent are exposed to any one, any two and all three respectively.

4. Results

4.1 Bivariate Analysis

Pearson's Chi square test of independence has been used to determine whether the significant difference exist between health service utilization and selected background characteristics. Both response variables (utilization of antenatal check up and child health services) are dichotomous (yes or no representing utilization and no utilization of a particular services). Although Chi square test uses both responses (yes or no) for analysis, the bivariate tables only provide the positive response only. Those relationship which are significant up to 10.0 percent have been explained.

Table 2 shows the percentage of women receiving at least one antenatal check up from skilled health workers by selected background characteristics. Among the variables included in bivariate analysis, age and education are strongly related with utilization of antenatal check up, where mass media exposure, household economic condition and caste have mild association with utilization of antenatal check up. For example, more than 77.0 percent of women with SLC and above education as compared with 28.6 percent of women with no education receive at least one antenatal check up. This may due to the fact that women with higher education may be aware to their and newborn health status as compared with their uneducated counterparts. This result is also confirmed by Nepal Demographic Health Survey [20].

Utilization of antenatal check up from skilled health workers is likely to be higher among women exposed to mass media as compared with their counterparts who do not get this opportunity. It varies from 34.8 percent for women having no exposure to 71.0 percent of women exposed to all three media.

Table 2: Percentage of women receiving at least one antenatal check up from skilled health workers by selected background characteristics, Nepal, 2010

Characteristic	Percent	Characteristic	Percent
Proximity of health facility*		Not working	57.1
Within half an hour	60.0	Agriculture	52.6
Within an hour	53.9	Non agriculture	68.0
More than an hour	52.2	**Place of residence**	
Age * **		Rural	66.6
15-24	76.9	Urban	70.4
25-39	71.9	**HH economic status ****	
40 and over	46.0	Poor	47.1
Education * **		Medium	63.0
No education	28.6	Rich	77.5
Primary	63.9	**Caste ****	
Up to Secondary	75.0	Upper	71.7
SLC and above	77.3	Indigenous	63.9
Mass media exposure **		Lower	48.8
No	34.8	**Religion**	
Any one	61.1	Hindu	63.6
Any two	66.7	Others	59.0
All three	71.4	N	127
Occupation			

Note
1.*p<0.10, **p<0.05, ***p<0.01 (p value is based on Chi- square statistics)
2. 334 cases are missing because the maternal health service was not utilized.

Household economic condition is positively associated with utilization of antenatal check up from skilled health workers and varies from 77.5 percent of women from the households with rich economic condition to 47.1 percent of women from the households with poor economic condition. More than 70.0 percent of women from upper caste as compared with 63.9 percent from indigenous and 48.8 percent from lower castes get at least one antenatal check up from skilled health workers.

Table 3 shows the percent of women who report that their children have received child health services by selected background characteristics. Within the reference period, all the children receive any health services. Most of the variables included in bivariate analysis do not have significant association with utilization of any child health services.

Table 3: Percentage of women who report that their children have receive any child health services by selected background characteristics, Nepal, 2010

Characteristic	Percent	Characteristic	Percent
Proximity of health facility		Not working	82.5
Within half an hour	97.3	Agriculture	92.5
Within an hour	96.9	Non agriculture	98.4
More than an hour	94.8	**Place of residence****	
Age		Rural	63.5
15-24	100.0	Urban	98.8
25-39	98.7	**HH economic condition ****	
40 and over	96.5	Poor	89.6
Education		Medium	92.1
No education	89.4	Rich	98.7
Primary	91.2	**Caste***	
Up to Secondary	97.3	Upper	99.6
SLC and above	98.9	Indigenous	92.4
Mass media exposure		Lower	59.9
None	95.8	**Religion ***	
Any one	97.1	Hindu	91.3
Any two	98.4	Others	98.8
All three	98.7	N	461
Occupation **			

*p<0.10 , **p<0.05, ***<0.01 (p value is based on Chi- square statistics)

4.2 Multivariate Analysis

All the variables included in bivariate analyses have also been used as covariates for the multivariate analysis. As mentioned previously, binary logistic regression model has been used to assess the relationship between covariates and health service utilization. The results have been presented in terms of coefficients and odds ratio with their significant values. Those relationship which are statistically significant up to 10.0 percent have been explained.

Table 4 shows the coefficients and odds ratio from logistic regression models of utilization of at least one antenatal check up by selected background characteristics. As expected, education (higher education), mass media exposure (all three) and household economic condition (rich) are significant positive determinants of antenatal check up. The odds of getting antenatal check up is likely to be higher among women having SLC and above education (odds ratio about 7.0 times for SLC and above ac compared to no education), exposed to mass media (odds ratio 2.8 times for women exposed to all three media) and are from the household with rich economic condition after controlling remaining variables in the model. Similarly, women from lower castes are less likely to receive at least one antenatal check up as compared with women from upper and indigenous castes.

Table 4: Odds ratios and coefficients from logistic regression models of utilization of at least one antenatal check up from skilled health workers by selected background characteristics

Characteristic	**Coefficients**	**Odds ratio**	**Characteristic**	**Coefficients**	**Odds ratio**
Proximity of health facility			Agriculture	-0.43	0.7
Within half an hour (r)		1	Non agriculture	0.57	1.3
Within an hour	0.74	1.5	**Place of residence**		
More than an hour	-0.12	0.8	Rural (r)		1
Age			Urban	0.52	1.5*
15-24 (r)		1	**HH economic status**		
25-39	0.63	1.3	Poor (r)		1
40 and over	-0.23	0.4	Medium	0.34	1.7
Education			Rich	1.2	3.5**
No education (r)		1	**Caste**		
Primary	0.92	2.7*	Upper (r)		1
Up to Secondary	1.14	4.6**	Indigenous	0.76	1.3*
SLC and above	1.78	6.8**	Lower	-0.23	0.5*
Mass media exposure			**Religion**		
None (r)		1	Hindu (r)		1
Any one	0.16	2.5	Others	0.81	1.7
Any two	0.57	2.7	R Square		0.34
All three	1.12	2.8**	-2LL		130.7
Occupation			N		127
Not working (r)		1			

*p<0.10, **p<0.05, ***<0.01 (p value is based on binary logistic regression)

Table 5 shows the odds ratio and coefficients from logistic regression models of utilization of any child health services by selected background characteristics. As earlier, education, mass media exposure and castes reveal more or less similar relationship with utilization of any child health services as in utilization of antenatal check up after controlling remaining variables in the model. However, household economic condition is positively associated with utilization of any child health services (odds ratio is about 2.0 times for households with rich economic condition). The findings of this study is also supported by a wealth of studies at a global level [8, 11, 13,18].

Table 5: Odds ratio and coefficients from logistic regression models of utilization of any child health services by selected background characteristics

Characteristic	Coefficients	Odds ratio	Characteristic	Coefficients	Odds ratio
Proximity of health facility			Agriculture	0.75	1.8
Within half an hour (r)		1	Non agriculture	1.2	3.9*
Within an hour	-0.14	0.5	**Place of residence**		
More than an hour	-0.08	0.3	Rural (r)		1
Age			Urban	0.86	1.6*
15-24 (r)	-	-	**HH economic status**		
25-39	-	-	Poor (r)		1
40 and over	-	-	Medium	0.69	1.4*
Education			Rich	0.80	1.7**
No education (r)		1	**Caste**		
Primary	0.58	1.3	Upper (r)		1
Up to Secondary	0.67	3.3	Indigenous	-0.49	0.5*
SLC and above	0.91	3.8*	Lower	-0.38	0.3**
Mass media exposure			**Religion**		
None (r)		1	Hindu (r)		1
Any one	1.2	2.8	Others	0.47	1.8
Any two	1.3	3.4*	R Square		0.40
All three	1.7	5.7**	-2LL		181.4
Occupation			N		461
Not working (r)		1			

*p<0.10, **p<0.05, ***<0.01 (p value is based on binary logistic regression)
- = Not available

5. Observation from Qualitative Exploration

A qualitative analysis was also conducted to understand the utilization of antenatal check up and child health services. For qualitative study, focus group discussion (FGD) and key informant interview were also conducted. A majority members of the focus group discussion express their feelings that existing health facilities are poorly equipped, not managed by the health professional. The free distribution of essential medicine is just for the slogan but not for the real practice. Some of the respondents of FGD state that the medicine is not sufficient for the needy people.

Likewise, some of the members of FGD express their opinion that it would be better to establish less number of well equipped health facilities rather than establishing a large number of substandard sub-health posts at VDC level without any basic infrastructure in the name of accessibility. They further suggest that the government should review the policy of establishing sub-health posts at the VDC level.

6. Summary and Conclusion

This paper attempts to explore the association between proximity of health facilities and uptake of antenatal check up and child health services in western Nepal. For analyzing the association between proximity of health facilities and utilization of services, this paper

captures two response variables: utilization of antenatal check up from skilled health workers and child health services. Both qualitative and quantitative techniques have been used.

Bivariate and multivariate analyses reveal that education, mass media exposure, household economic condition are significantly associated with utilization of antenatal check up from skilled health workers. First, education not only empowers women towards their own health but also teaches ways of living healthy life. Second, mass media exposure is one of the significant factors that has positive influence on utilization of health facilities. The potential explanation of this reason may be due to the fact that mass media not only makes aware towards their health but also facilitates to find the different sources of health facilities, which ultimately enhances the better health practices. This is also validated by other studies [19].

The analyses presented here also demonstrate that the household economic condition is significantly related with utilization of health services. It is logical that health service utilization becomes more easier when respondents have sound economic condition because they have the various options for selecting the availability of different health facilities. Wealth of literatures also support this finding at the global level [6, 22, 26, 27].

This study contributes a better understanding towards the accessibility of health facilities and its impact on health service utilization in Nepal. From the observation, this study is conclusive that proximity of health facilities does not matter in uptake of health services (particularly, antenatal check up and child health). Therefore, the finding of this study suggests that there should be a detailed review on the government policy to operate one sub health post at VDC level. In addition, the discrepancy in utilization of health service in terms of household economic condition should be minimized by adopting pro-poor policies. This problem may not be addressed immediately but can be minimized by adopting special programs for the urban and rural poor in government health facilities.

Although, a wealth of literatures reveal a strong association between proximity of health facilities and utilization of health services at the global context, this study (results obtained from quantitative and qualitative exploration) is not conclusive to show a significant association between proximity of health facilities and uptake of antenatal check up and child health services. There may be various potential reasons. The possible reasons may be due to the selection of the study areas, methodological limitations and measurement issues. Further study is suggested to draw the firm conclusion in this regards.

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