Socio-demographic and programmatic determinants of obstetric morbidity and related care seeking behaviour in Nepal

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Abstract

Maternal mortality and morbidity is used as a key indicator for the monitoring of maternal health in international literature. Care seeking patterns in terms of obstetric morbidity in Nepalese context is scanty. The objective of this study is to examine if there is variation of obstetric morbidity and care seeking behaviour across the clusters and to investigate the association of socio-demographic, programmatic and community factors with obstetric morbidity and related care seeking behaviour.

The findings show that 21 percent women reported having experienced obstetric morbidity during pregnancy and of them 65 percent sought care for the morbidity. Women living in mountain were more likely to report the morbidity but less likely to seek care compared to those living in Terai. While age, education, alcohol consumption and exposure of radio program on maternal health were significant predictors of obstetric morbidity, age, education, receipt of iron tablet and smoking were significant predictor for care seeking behaviour. Both the obstetric morbidity and care seeking behaviour varied across the clusters, however, only a small portion of the cluster-level variation were explained by explanatory variables.

Introduction

It has been estimated that 529,000 women of reproductive age die every year globally due to pregnancy-related causes and about 68,000 as a consequence of abortion (WHO, 2005). These deaths represent only a small fraction of the total burden of disease associated with pregnancy and child birth (World Bank, 1993). The World Health Organization (WHO) estimates that about 30-60 million women suffer severe illness as a result of serious maternal complications. About one third of women in developing countries suffer from such complications (WHO, 2005). The WHO working group also suggests that a minimum of 15 percent of pregnant women develop severe morbidities that require medical care in order to avoid maternal death or disability.

Maternal mortality has been used as a key indicator to monitor the effectiveness of maternal health program. In most countries maternal mortality rates are low and hence changes are difficult to track. Obstetric morbidity has therefore been suggested as an alternative indicator (Brace et al, 2004, Danel et al, 2003, Waterstone et al, 2001). Even though obstetric morbidity and maternal death measure similar medical problems, the incidence of obstetric morbidity is much higher than that of maternal mortality (Wen et al, 2005).

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Complications arising from pregnancy and delivery remain one of the leading causes of death among women in Nepal. Haemorrhage, sepsis and eclampsia account for most of the deaths (MoHP, 1998). Nepal is committed to reduce the maternal mortality ratio to 231 per 100,000 live births by the end of 2015 (MoHP, 2006). Even though the maternal mortality ratio has been reported to 281 per thousand live birth in 2006 (MoHP, 2007), there is also a growing attention to the fact that the reduction of maternal morbidity during pregnancy, delivery, and after delivery should be an important strategy to reduce maternal mortality (Iyengar and Iyengar, 2004). But, there are only a limited researches available examining prevalence and determinants of obstetric morbidity and related care seeking behaviour (Fortney and Smith, 1996). A study carried out in Kanchanaburi Demographic Surveillance System Thailand, indicates that thirty-nine percent of the women experienced at least one severe obstetric morbidity during pregnancy and only about half of them sought appropriate care (Sharma and Vong-ek, 2008). This information is however not known in Nepalese situation and would be very much useful for safe motherhood program implementation in the context of Nepal's epidemiological transition from high incidence of infectious disease to the chronic diseases (Suvedi, 2007).

Objectives

The objectives of this study are to examine if there is any variation among clusters in reporting obstetric morbidity and seeking care for obstetric morbidity, specifically:

1. To investigate individual socio-demographic and programmatic determinants of obstetric morbidity,
2. To examine if the care seeking behaviour is associated with the socio-demographic and program characteristics

Methodology

Secondary data from a survey called "*Between Census Household Information for Monitoring and Evaluation System*" (BECHIMES) has been used to get the information on Obstetric morbidity (CBS, 2001). This data was collected by CBS in year 2000 and was published in 2001. Although data is a bit old but there is no such national level survey after year 2000. So it is a compulsion to use this data.

Frequency distribution, cross-tabulation (not shown) and multi-level logistic regression analysis were used to examine the level of obstetric morbidity and related care seeking behaviour and their association with individual, household and program variables.

Four multi-level models considering women *i* nested within cluster *j* were estimated to examine if there is any variation of obstetric morbidity and related care seeking behaviour across the clusters and to examine their association with

socio-demographic and programmatic factors. First model called the intercept only model was estimated without including explanatory variables. The intercept only model helps to measure the relative importance of explanatory variables in accounting for cluster-level variation in obstetric morbidity and care seeking behaviour. Second model examines the associations of household and geographical variables on the odds of reporting obstetric morbidity and related care seeking behaviour. Third model includes the individual-level socio-demographic variables such as age, education and alcohol consumption. Fourth model further included program variables.

Findings

Out of 2044 respondents used for analysis of obstetric morbidity, nine percent were of age below 20, almost seven percent were of age over 35. More than half (55.2%) of them never had been to school, 22 percent were living in urban areas, 34 percent were Janjatis, almost 13 percent had smoked during pregnancy, 12 percent had consumed alcohol, slightly more than three quarters (76.5%) had knowledge of family planning services, 43 percent had heard radio program *Ghanti Heri Haad Nilaun* and half of them had received iron supplementation during pregnancy.

The pattern of distribution of 421 women who were used for the analysis of obstetric morbidity care seeking behaviour was similar to that of the distribution pattern of obstetric morbidity. Univariate analysis (not shown in table) revealed that almost 21 percent (421 out of 2044) of the women reported that they had experienced obstetric morbidity during pregnancy. Of those who reported having experienced obstetric morbidity during pregnancy, almost 65 percent reported that they had sought appropriate care for the morbidity.

Table 1 summarizes the models used to examine the association of explanatory variables on obstetric morbidity during pregnancy. Model 1 in Table 2 indicates that there was significant unexplained cluster-level variance on obstetric morbidity during pregnancy (0.69). It further indicated that the amount of variation in obstetric morbidity that was attributed to the cluster-level was about 17% {. = 0.69/ (3.29+0.69}. Slightly more than one percent of the cluster-level variation found in model 1 was explained by the geographical and household-level variables included in Model 2 {(0.69-0.68)/0.69}. The socio-demographic variables included in Model 3 and the programmatic variables included in Model 4 are also not being able to explain the cluster-level variation in obstetric morbidity. To understand which explanatory variable were associated with obstetric morbidity, the fixed effects are examined.

Examination of fixed effects of different models in Table 1 indicated that only the ecological zone showed a significant association with self-reported obstetric morbidity. Compared to those living in Terai, women living in hill were less likely to report obstetric morbidity during pregnancy but the women living in mountain were more likely to report the morbidity. With regard to individual-level socio-demographic variables, age, education and alcohol consumption showed significant association with the odds of reporting obstetric morbidity during pregnancy. Older and more educated women were found more likely to report obstetric morbidity than their younger and less educated counter parts. Women who consumed alcohol during pregnancy were however found less-likely to report the morbidity.

Respondents, who had received iron tablet during pregnancy, were also more likely to report obstetric morbidity than their counterparts. Even though the exposure of family planning message in radio program was positively associated with self-reported obstetric morbidity, knowledge of family planning methods however did not show significant association with it.

Table 1: Multilevel logistic regression result for socio-demographic and programmatic determinants of obstetric morbidity during pregnancy

Determinants of obstetric morbidity	Model 1 OR(SE)	Model 2 OR(SE)	Model 3 OR(SE)	Model 4 OR(SE)
Ecological zone				
Tarai ®				
Hill	0.61 (0.12)*	0.65 (0.13)*	0.67 (0.13)*	0.61 (0.12)*
Mountain	1.10 (0.32)	1.11 (0.32)	1.16 (0.34)	1.07 (0.32)
Place of residence				
Rural ®				
Urban		0.87 (0.13)	0.80 (0.19)	0.73 (0.18)
Head of household				
Female ®				
Male		1.43 (0.38)	1.39 (0.38)	1.40 (0.38)
Religion				
Nonhindu ®				
Hindu		1.15 (0.29)	1.19 (0.31)	1.17 (0.30)
Ethnicity				
Uppercast ®				
Janjati		1.07 (0.18)	1.26 (0.22)	1.28 (0.23)
Other		1.13 (0.21)	1.31 (0.25)	1.38 (0.27)^
Age				
Under 20 ®				
20 to 35			1.06 (0.22)	0.99 (0.21)
Over 35			1.92 (0.58)*	1.84 (0.56)*
Education				
Noschooling ®				
Primary			0.99 (0.19)	0.88 (0.18)
Secondary+			1.29 (0.20)^	1.05 (0.17)
Smoke during				
No ®				

Yes			1.04 (0.21)	1.09 (0.22)
Consume alcohol				
No ®				
Yes			0.59 (0.14)*	0.58 (0.14)*
Know about family				
No ®				
Yes				1.25 (0.20)
Heard program ghanti				
No ®				
Yes				1.28 (0.17)^
Received iron tablets				
No ®				
Yes				1.58 (0.21)*
Cluster level variance	0.69 (0.15)*	0.68 (0.15)*	0.68 (0.15)*	0.69 (0.16)*
Log likelihood	-996	-995	-988	-978
Total cluster used	193	193	193	193
Total individual used	2044	2044	2044	2044

Table 2 summarizes the models used to examine the association of explanatory variables on obstetric morbidity care seeking behaviour. Model 1 in Table 2 indicated that there is significant variation of obstetric morbidity care seeking behaviour across the clusters. Amount of variation that is attributed to the cluster-level was about 25% {1.11/ (3.29+1.11}. About 14 percent of the cluster-level variation found in model 1 was explained by the geographical and household-level variables included in Model 2 {(1.11-0.96)/1.11}. Individual socio-demographic variables included in the Model 3 are not being able to explain any cluster-level variation of care seeking behaviour found in Model 2. The program variables included in Model 4 have however explained almost 22 percent {(0.96-0.75)/0.96} of the cluster-level variation of care seeking behaviour observed in Model 3.

Only four explanatory variables were found to have significant association with obstetric morbidity care seeking behaviour. Older women with relatively higher level of education and those who had received iron tablets during pregnancy were more likely to seek care for obstetric morbidity. Women who used to smoke during pregnancy were significantly less likely to seek the care. The radio program on maternal health and the knowledge of family planning were not found to have significant association with obstetric morbidity care seeking behaviour.

Table 2: Multilevel logistic regression result for socio-demographic and programmatic determinants of obstetric morbidity care seeking behaviour

Determinants of obstetric morbidity	Model 1 OR(SE)	Model 2 OR(SE)	Model 3 OR(SE)	Model 4 OR(SE)
Ecological zone				
Tarai ®				
Hill	1.46 (0.49)	1.30 (0.44)	1.39 (0.48)	1.23 (0.41)
Mountain	0.56 (0.28)	0.55 (0.27)	0.83 (0.43)	0.98 (0.49)
Place of residence				
Rural ®				
Urban		1.83 (0.74)	1.31 (0.56)	1.17 (0.48)
Head of household				
Female ®				
Male		0.67 (0.41)	0.84 (0.54)	0.80 (0.52)
Religion				
Nonhindu ®				
Hindu		0.65 (0.36)	0.63 (0.36)	0.62 (0.35)
Ethnicity				
Uppercast ®				
Janjati		0.75 (0.25)	0.92 (0.34)	0.95 (0.34)
Other		1.03 (0.36)	1.32 (0.49)	1.32 (0.48)
Age				
Under 20 ®				
20 to 35			3.05 (1.23)**	2.77 (1.11)*
Over 35			2.30 (1.30)	2.22 (1.25)
Education				
Noschooling ®				
Primary			2.47 (1.05)*	2.19 (0.93)^
Secondary+			2.27 (0.71)**	1.95 (0.63)*
Smoke during				
No ®				
Yes			0.45 (0.17)	0.49 (0.18)^
Consume alcohol				
No ®				
Yes			0.73 (0.37)	0.64 (0.32)
Know about family				
No ®				
Yes				1.06 (0.34)
Heard program ghanti				
No ®				1.01 (0.28)
Yes				
Received iron tablets				
No ®				
Yes				2.20 (0.57)**
Cluster level variance	1.11 (0.49)*	0.96 (0.48)*	0.97 (0.51)	0.75 (0.50)
Log likelihood	-264.6	-262.5	-250.0	-245.4
Total cluster used	148	148	148	148
Total individual used	421	421	421	421

Discussion and conclusion:

In the survey, currently married women of reproductive age were asked if they had delivered a baby during the last five years or are currently pregnant. If they said yes, they were asked if they had gone for ANC services. Among such women who had gone for an ANC check-up were further asked if they experienced any complications *(high blood pressure, oedma of face or hand, lack of blood or anaemia, high fever, convulsion, vaginal bleeding, vaginal discharge, severe abdominal pain and other if any)* during the pregnancy period and whether they received any care for the complications. Similarly, those who had delivered a baby were asked if they experienced any complications *(prolonged obstructed labour, life-threatening excessive bleeding, high fever with bad smelling vaginal discharge and convulsion)* during delivery and corresponding care seeking behaviour. After excluding the missing cases, 2044 responses have been analysed for determinants of obstetric morbidity and 421 women for the analysis of determinants of care seeking behaviour.

We also used ecological zone and place of residence as cluster-level variables, sex of head of household, religion and ethnicity as the household-level variables, age, education, smoking and alcohol consumption as an individual-level socio-demographic variables and the knowledge of family planning to avoid pregnancy, heard radio program *"Ghanti Heri Haad Nilaun"* and receive iron tablet during pregnancy as the program variables in the analysis.

Univariate analysis (not shown) indicated that the prevalence of obstetric morbidity during pregnancy was 21 percent in Nepal. It is also observed that slightly more than one-third (35%) women who had experienced obstetric morbidity did not receive appropriate care. To find answer as to why they did not seek care is very important. A qualitative study among women reporting lack of appropriate care would provide important information for program planning and management of obstetric morbidity in Nepal.

The multilevel logistic regression result indicated that some program factors were positively associated with reporting obstetric morbidity and related care seeking behaviour. For example women who had knowledge about family planning to prevent pregnancy, who had heard the radio program "Ghanti Heri Haad Nilaun", and who had received iron tables during pregnancy were more likely to report obstetric morbidity during pregnancy and were more likely to receive care for the morbidity. This result reveals that the mass media and other preventive health programs have been effective to create awareness on the signs and symptoms of obstetric morbidity and their consequences on the maternal health. The impact of these preventive health programs is however not been homogeneous across the country. For example women living in the mountain were more likely to report obstetric morbidity and less likely to seek care for the morbidity compared to women living in Terai. Similarly women living in the hill were however less likely

to report obstetric morbidity during pregnancy but more likely to seek care compared to those living in Terai. This result suggest that government of Nepal has to put more resources on the supply of health services and launch innovative program to create awareness on obstetric morbidity in the mountain region.

We did not find any difference of reporting obstetric morbidity and related care seeking behaviour in urban and rural areas. Obstetric morbidity and care seeking behaviour was also not associated with the sex of household head and religion. Age and level of education were however able to determine the pattern of obstetric morbidity and corresponding care seeking behaviour. For example, women of age over 35 year were more likely to report obstetric morbidity during pregnancy compared to their younger women of age below 20 years. Similarly, women with primary or higher level of education were more likely to receive care for obstetric morbidity during pregnancy compared to their illiterate counterparts.

It is believed that culture is an integral component in defining and achieving a state of health, maintaining health and treating illness (McElroy, 2000). Multilevel analysis supported this theory and indicated that the odds of reporting obstetric morbidity during pregnancy was higher among Juniata and other ethnic minority women compared to the upper casts.

The multilevel logistic regression results also indicated that both the obstetric morbidity and care seeking behaviour varied across the clusters, however only a small part of the cluster level variation was explained by household, individual and program variables included in the models this may be due to the fact that sufficient confounders were not included in the model. The significant cluster-level variance that remained un-explained even after controlling for the individual socio-demographic and programmatic characteristics further suggests that cluster-level factors might explain the obstetric morbidity and related care seeking behaviour. As relevant cluster-level factors were not included in this study, further study would be desirable to give further direction on the contextual influences on obstetric morbidity and care seeking behaviour in Nepal.

Many studies are documented to explain the impact of cluster-level factors on health outcome in other countries. For example, a study carried out in India suggests that the availability of quality health services in the cluster influence reproductive morbidity (Stephenson and Tzu, 2003). Maternal morbidity may also be higher in specific socio-cultural and political situation (Miller et al, 2003). Poor quality of community and household amenities were found to be associated with the increased morbidity among women and their children in Cameroon and Bangladesh (Gill and Ahmed, 2004). Women living in the communities lacking school, health centre and transportation facilities reported more morbidity. Women's position within the community stratified with ethnic affiliation, and labour force participation put women more vulnerable to high rates of illness. Socio-cultural barriers, poverty and poor infrastructure of road, transportation and

communication were also found to be significant barriers to accessing obstetric services (Gill and Ahmed, 2004, Defoe, 1996). Therefore, these community-level factors (such as availability of health services, socio-economic status of community, availability of school, health centre, communication and transportation in the community women's position and labour force participation in the community) need to be taken into consideration while assessing determinants of obstetric morbidity and related care seeking behaviour and implementing program to improve maternal health in Nepal in the future.

References

Brace, V., G. Penney and M. Hall. (2004). "Quantifying Severe Maternal Morbidity: a Scottish Population Study". *International Journal of Obstetrics and Gynaecology*:111(5).

CBS. (2001). "Report on the Situation of Women, Children and Households between Census Household Information, Monitoring and Evaluation System (BECHIMES)". Central Bureau of Statistics, Kathmandu, Nepal.

Danel, I., C. Berg, C.H. Johnson, H. Atrash.(2003). "Magnitude of Maternal Morbidity During Labour and Delivery: United States 1993-1997". *American Journal of Public Health*:93.

Defo, B.K. (1996). "Effects of Socioeconomic Disadvantage and Women's Status on Women's Health in Cameroon". *Social Science and Medicine*: 44(7).

Fortney, J.A., & J.B. Smith.(1996). "The Base of the Iceberg: Prevalence and Perceptions of Maternal Morbidity in Four Developing Countries". *Maternal and Neonatal Health Centre*.North Carolina, USA.

Gill, Z., J.U.Ahmed.(2004). "Experience from Bangladesh: Implementing Emergency Obstetric Care as Part of the Reproductive Health Agenda". *International Journal of Gynaecology and Obstetrics*: 85.

Iyengar, K., & Iyengar, S.D. (2004). *Research Needs in Maternal Morbidity*. Global Forum for Health Research Forum , Mexico City.

McElroy, A. and M.Annjezewski.(2000). "Cultural Variation in the Experience of Health and Illness". *In* Albrecht, G.L., R. Fitzpatrick and S.C. Scrimshaw (eds.) *Hand Book of Social Studies in Health and Medicine*. Sage Publication, Bonni, London.

Miller, S., L.S. Nancy, B. Winikoff, A. Langer and F.F. Fariyal.(2003). "Where is the 'E' in MCH? The Need for an Evidence-Based Approach in Safe Motherhood". *Journal of Midwifery and Women's Health*: 48(1).

MoHP. (1998). *Nepal Maternal Mortality and Morbidity Study*. Ministry of Health and Population, Family Health Division, Kathmandu, Nepal.

MoHP. (2006). National *Safe Motherhood and Newborn Health-Long Term Plan (2006-2017)*. Ministry of Health and Population, Family Health Division, Kathmandu, Nepal.

MoHP. (2007). *Nepal Demographic and Health Survey 2006*. Ministry of Health and Population, Family Health Division, Kathmandu, Nepal.

Sharma, S.K, and P.Vong-ek. (2008). "Obstetric Morbidity Care in Thailand: Do Communities Matter?". *Journal of Population and Social Studies*:16 (2).

Stephenson, R. and A.O. Tsui.(2003). "Contextual Influences on Reproductive Wellness in Northern India". *American Journal of Public Health*: 93(11).

Suvedi, B.K. (2007). "Of What Diseases Are Nepalese People Dying?". *Kathmandu University Medical Journal*:17(1).

Waterstone, M., S. Bewley, C. Wolfe.(2001). "Incidence and predictors of severe obstetric morbidity: case control study". *British Medical Journal*:322(7294).

Wen, S.W., L. Huang, R. Liston, M. Heaman, T. Baskett, I.D. Rusen. (2005). "Severe maternal morbidity in Canada 1991-2001". *Canadian Medical Association Journal*:173(7).

WHO. (2005). *The World Health Report, 2005, Make Every Mother and Child Count*. World Health Organization, Switzerland, Geneva.

World Bank.(1993). *World Development Report 1993: Investigating in Health*. Oxford University Press.