

Comparative analysis of the use of professional health providers by young mothers in developing countries: A new frontier for health education

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Abstract

Childbearing accelerates the risk of maternal and child morbidity and young mothers have a much higher risk of dying from maternal causes. Therefore, understanding the dynamics of young mothers' use of professional health providers during pregnancy and childbirth in developing countries as well as identifying the socioeconomic factors that influence them is imperative. The paper investigates the relationship between the utilization of professional health providers and socioeconomic influence in Kenya, Ethiopia, Haiti, Bangladesh and Guyana. Both Chi-square and logistic regression models were used on the Demographic and Health Survey data set of the select countries to determine the relationship between young mothers' characteristics and use of professional health providers. Using bivariate and multivariate analysis, socioeconomic and demographic factors were triangulated to capture the relationships between professional health providers' utilization and young mothers. Test statistics showed that age and education had a positive, statistically significant relationship with the young mothers' use of professional health providers for delivery in Kenya, ($p=0.01<0.05$) in Ethiopia ($p=0.01<0.05$) and in Haiti ($p=0.01<0.05$). The results of logistic regression also showed a positive statistical significance between the young mothers' use of professional health providers and level of education, wealth, and place of residence ($p=0.05$) for the select countries. Our findings suggest that socioeconomic conditions in the selected countries influence the use of professionals for both prenatal and natal care. In order to improve maternal and child health in accordance with Sustainable Development Goals, emphasis should be placed on providing health education for young women and expanding the knowledge curriculum of professional health providers that attend to them. While recognizing that the health educator has contributions to make on both the micro and macro change levels, a case is made for moving the field of health education further in the broad direction of prenatal and natal care. This would impact positively on the socioeconomic status of women in general.

Introduction

Improving maternal and child health was one of the United Nations Millennium Development Goals, where professional health assistance is required as an input factor. This was intended to be a significant indicator in monitoring progress towards Millennium Development Goal five in reducing the maternal mortality ratio by three quarters and child

mortality by two-thirds between 1990 and 2015. Nonetheless, this result was not realized by any developing countries. However, the use of skilled health providers rates has increased since 1990 (WHO, 2013); nevertheless, in developing countries a majority of young women still deliver at home and without the assistance of professional health providers. A number of different international conferences have been held with the aim of addressing the issue of maternal health, including the Safe Motherhood International Conference held in Nairobi in 1987, which had as a main goal to raise global awareness of the impact of maternal mortality and morbidity (Maine et al., 1999). The conference drew attention to the consequences of poor maternal health in developing countries caused by the non-use of professional attendants and mobilized action to address the high rates of death and disability in order to find solutions (UNFPA, 2013). Other conferences that have had the same aim include the World Summit for Children in 1990, the International Conference on Population and Development in 1994 held in Cairo, the Fourth World Conference on Women in 1995 (Obaid, 2009; Maine et al., 1999), the 1997 Safe Motherhood Initiative Technical Consultation, and the 1999 International Conference on Population and Development+5 (Santon et al., 2007). The development of a policy of skilled birth attendants embodies a commitment to skilled attendance at every birth, whether at home or in a health facility (Campbell & Graham, 2006). Furthermore, safe Motherhood Strategies were developed based on pregnancy, prenatal care, delivery care and the postpartum period (6) WHO (1994) and the specific activities and pillar of the initiative included the provision of prenatal care, clean and safe delivery (skilled assistance) in health facilities for normal deliveries (appropriate referral) for obstetric complications, postnatal care, family planning and other reproductive health services (WHO, 1994; Haque, 2014). Agreeing on the mantra “health for all” the UN in 2001 specified eight aims and measurable targets, and among them were improving maternal and child health. Under Millennium Development Goal four and five, countries were encouraged to reduce maternal mortality. However, a major drawback of the Millennium Declaration was the absence of targets for skilled attendance at birth. Yet, such targets were established by the 1999 United Nations International Conference on Population and Development + five. Interestingly, this agreement, which was signed by 179 country’s representatives, set a goal of forty percent of all births to be assisted by a skilled attendant by 2005. The agreement stated that there will be fifty percent coverage by 2010 and sixty percent by 2015 among countries with very high maternal mortality. Paradoxically, there were no counter-factual on the progression for the target. Internationally the goal was to have eighty percent of all births assisted by skilled attendants by 2005, eight five percent by 2010 and ninety percent by 2015 (Santon et al., 2007). The issue of professional health providers has provoked debate in the development literature. Who should assist women during prenatal and natal care and what should these attendants do and not do under various circumstances, have not been agreed upon. Policies regarding these questions have been debated for hundreds of years. In 13th century Europe, there was debate regarding who could perform a caesarean; in mid-18th century France debate surrounded the royally mandated childbirth trainings for rural women in rural places; in the United States of America currently there is a debate regarding the right to a home-based birth. Nevertheless, in the developing world, the argument regarding promotion of health facility-based births still linger and seem likely to continue indefinitely.

A study done in Ghana by (Adjasi & Abor, 2011) argued that the level of usage of professional maternal health care services for prenatal care, delivery of health facilities, and postnatal care was low. Other studies have also found that socioeconomic factors, including cost, household income, women's employment, media exposure and having a history of obstetric complications, also influence the usage of professional health care givers'. The proportion of births assisted by trained birth attendants and local staff has become an important indicator to measure the progress of improving maternal and child health. Despite the effort made, many studies show that young mothers are still attending prenatal care late and are delivered unassisted by a professional health provider (Reynolds et al., 2006). Nonetheless, notwithstanding increasing proportions of facility-based births and the presence of a long list of evidence-based interventions in developing countries to address the main causes of maternal death, little change has been documented. A further challenge is why, for any given level of professional attendance at birth, maternal mortality is higher in sub-Saharan Africa, Asia and some parts of America than in other world regions. This study investigates the use of professional health providers' by answering the following question: What is the socioeconomic and demographic characteristic of young mothers who are likely to use professional health providers? The paper intends to highlight possible areas of health education in developing nations and provides further understanding of young mothers' use of professional health providers during pregnancy and at birth delivery

Methodology

In our analysis, we compared the use of professional health providers among young mothers across six (6) developing countries; Kenya, Ethiopia, Nepal, Bangladesh, Haiti, and Guyana. In identifying the countries above, we used a three stage process. Countries selected for inclusion in the study were limited to those with a DHS conducted between 2005 and 2010, because the recent dates are more accurate and relevant in making policy programmatic recommendations. Three (3) regions of interest were identified, namely; Sub Saharan Africa, Latin America, and South Asia. Finally, two countries, were chosen in each region and these countries were chosen according to the accuracy and consistency of their data. Sub-Saharan Africa is still the riskiest region in the world as regards maternal mortality and Africa's performance on the MDGs indicators showed large challenges still remain. In addition, Guyana, despite being on the South American continent is among five in the Caribbean and the Americas with the highest rates of maternal mortality. We used secondary data from the DHS, which are nationally representative household surveys that collect data on a wide range of indicators in the area of population, health and nutrition. Specifically, we used the 2005 Ethiopian (DHS), 2008-9 Kenya (DHS), 2006 Nepal (DHS), 2007 Bangladesh (DHS), 2005-6 Haiti (DHS), and 2009 Guyana (DHS). The total number of young mothers aged fifteen to nineteen was 300 in Kenya DHS 2008-9, 441 in Ethiopia DHS 2005, 321 in Nepal DHS 2006, 301 in Haiti DHS 2005-6, 173 in Guyana DHS 2009, and 753 in Bangladesh DHS 2007. Our research design met the sampling requirements, as it used probability sampling to select all the respondents in the household. In general, a Demographic Health Survey sample is stratified, clustered and selected in two stages. Since the data was needed for each city in the county, each city was considered as an explicit stratum. The first stage involved the selection of Enumeration Areas (EAs) within each city in each country. The EAs within each

city were selected using probability proportional size sampling. In the second stage, complete listings of households were carried out in each selected cluster for the selection of dwelling units. The selection of dwelling units was based on the sampling frame which is systematically selected from each cluster for participating in the survey. The surveys used questionnaires to interview all women aged fifteen to forty nine who were either permanent residents of the households or visitors present in the household on the night before the survey. Nonetheless, our analysis is limited only to young women aged fifteen to nineteen in the household. We identified demographic and socioeconomic factors that affect the use of such services in the developing countries, and we relied on the following hypothesis:

- a. The use of professional health providers varies according to a young mother's age;
- b. The more educated young mothers are more likely to use professional health providers during pregnancy for delivery care and vice-versa;
- c. Wealthy young mothers are more likely to use health services than poorer mothers;
- d. Young mothers living in urban areas are more likely to use professional health providers and institutional sites for delivery than rural women; and
- e. Marital status is an important factor that promotes the use health services.

Selected variables

Professional health providers can be defined as “exclusively referring to people with midwife skills (such as doctors, nurses and midwives) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose or refer obstetric complications (Adegoke & van den Broek, 2009). The term skilled birth attendance has been defined as the process by which a woman is provided with adequate care during labour, delivery and the early postpartum period (Graham et al., 2001).

a) Dependent variable

In this instance, young mothers' receipt of prenatal care from professional health providers is the dependent variable. To explore the variable further, the following questions were asked “Did you see anyone for Prenatal care for this pregnancy if yes, who? This variable was measured by the frequency of yes or no answers for young mothers who received prenatal care from a professional health provider, such as (doctor, midwife and nurse) or non-professional health providers (health assistant, health worker or other personnel). The use of professional health providers for delivery was further explored by asking “who assisted you with delivery?” as measured by whether or not women had a skilled delivery attendant. A young mother was considered to be assisted by a “professional health provider” if she reported being assisted by a (doctor, nurse or midwife) and those young mothers who reported being assisted by (relative, health worker, or other health provider) are considered as assisted by “non - professional health providers”.

b) Independent variables

There is no doubt that the socioeconomic environment of young mothers can constrain the use of professional health providers. Therefore, in our analysis, we subdivided the young

mothers' age into three categories, namely, 15-16, 17-18, and 19. The level of education was defined as not educated, primary, while secondary and higher was collapsed together. Furthermore, place of residence was defined as urban and rural, marital status classified in two categories single (single, widow, never married, divorced) and married (married and living together), and the wealth quintile was defined in three categories (poor, poorer and poorest), middle, and (rich, richer and richest). To identify the factors associated with the use of professional health providers, namely, the assistance of a doctor or nurse at delivery and Pre-natal care we examined the bivariate differential of the selected socioeconomic and demographic characteristics. In table 1 the Pearson Chi-Square was used to test the hypothesis formulated.

Results

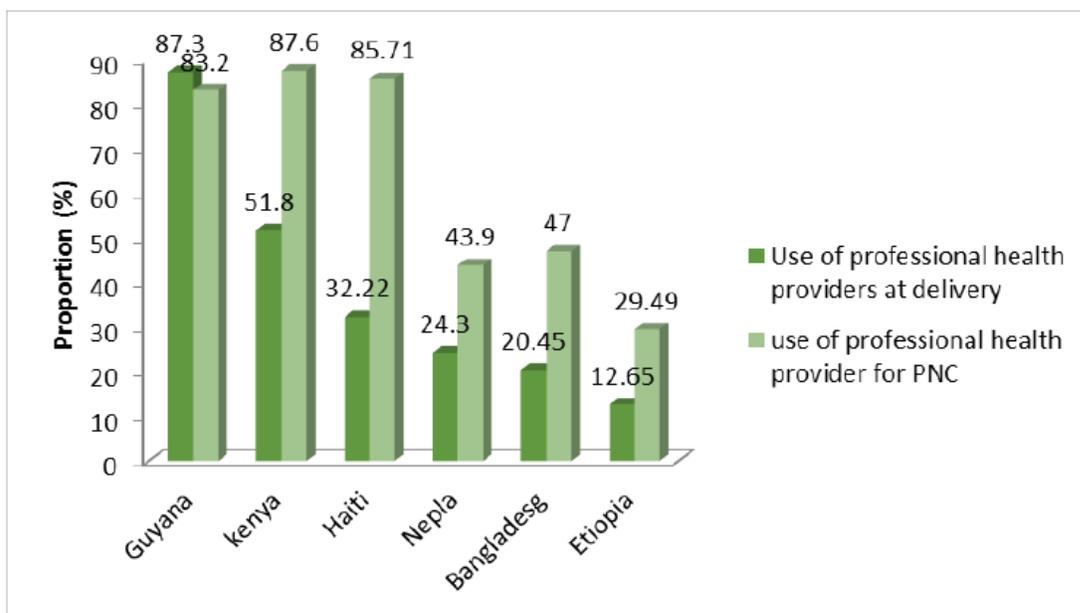


Figure 1: Percentage of young mothers' use of professional health providers and health facilities for pre and post natal care by study countries

Source: Demographic and Health Survey data from Selected Countries

Descriptively, Figure 1 summarizes the information related to young mother's use of professional health providers for natal care and prenatal care by the countries.

A high proportion of women reported receipt of prenatal care from professional health providers in Kenya (83.2), Haiti (85.7) and Guyana (83.2) while the proportion of young mothers who reported was much lower in Nepal (24.3), Ethiopia (12.6) and Bangladesh (20.4) respectively (Figure 1 and Table 1). Ironically, Kenya and Haiti reported lower use of professionals during child births.

Table 1: Chi-Square results on use of professional health providers by young mothers by selected countries

Variable	Kenya 2008-9		Ethiopia 2005		Nepal 2006		Bangladesh 2007		Haiti 2005-6		Guyana 2009	
	1	2	1	2	1	2	1	2	1	2	1	2
Age	0.42	0.91	0.94	0.71	0.15	0.00	0.21	0.16	0.15	0.90	0.67	0.47
Level of education	0.00	0.72	0.00	0.86	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.24
Wealth quintile	0.00	0.07	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.28	0.01	0.03
Place of residence	0.00	0.15	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.58	0.14	0.14
Marital status	0.39	1.00	0.25	0.84	0.56	1.00	0.49	1.00	1.00	0.62	1.00	0.60

*Sig P<= 0.05 not Sig if P >0.05;

1. The use of professional health provider for birth delivery;
2. The use of professional health providers for prenatal care.

Table 1 provides the information on young mothers' use of professional health providers for prenatal care and birth delivery. The Chi- square test was used to determine the relationship between young mothers' characteristics and the use of professional health providers. Results show a significant relationship between age and assistance of professional health providers for prenatal care in Nepal at ($p=0.00<0.05$), while in Kenya, Ethiopia, Bangladesh, Haiti, and Guyana age did not show significant results on both assistance of professional health

providers for birth delivery and prenatal care. A significant relationship was found between the mothers' level of education and assistance of professional health providers at delivery in Kenya, Ethiopia, Nepal, Bangladesh and Haiti ($p=0.00<0.05$) with the exception of Guyana ($p=0.13>0.05$). Results show a significant relationship between the use of professional health providers for prenatal care and young mothers' level of education in Nepal, Bangladesh and Haiti, while the test was not significant in Kenya, Ethiopia and Guyana. Results further indicate that wealth status of mothers is a factor which influences the use of professional health providers across countries. A significant relationship was found between assistance of professional health providers for delivery and wealth status in all six countries at ($p=0.00<0.05$). Also test statistics showed significance between the wealth index and the use of professional health provider for prenatal care in Nepal ($p=0.00<0.00$), Bangladesh ($p=0.00<0.05$) and Guyana ($p=0.01<0.05$). It is hypothesized that mothers from urban areas are more likely to be assisted by professional health providers than those from rural areas. The Pearson Chi-square was used to test the relationship between those two variables. Significance was found between young mothers' use of professional health providers for delivery and place of residence at ($P=0.00<0.05$) in Kenya, Ethiopia, Haiti, Nepal, Bangladesh, except Guyana ($P=0.14>0.05$), while in Kenya, Ethiopia, Nepal, and Guyana the relationship between place of residence and prenatal care was not significant. Furthermore, Marital status affects the use of professional health providers, but in this analysis, marital status did not play an important role in influencing young mother use of professional health providers for both delivery and Prenatal care.

Table 2: Binary Logistic Regression between the use of professional health provider for child birth care and selected independent variables (DHS 2005-2010)

Countries Variable	Kenya 2008-9		Ethiopia 2005		Nepal 2006		Bangladesh 2007		Haiti 2005-6		Guyana 2009	
	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)
Age group												
15-16	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17-18	0.01	0.34	0.12	0.42	0.87	1.09	0.50	0.81	0.01	0.32	0.67	1.39
19+	0.01	0.34	0.01	0.17	0.33	0.58	0.87	0.95	0.01	0.15	0.75	0.78
Level of education												
No education	1.00		1.00		1.00		1.00		1.00		1.00	
Primary	0.56	1.33	0.00	3.61	0.67	1.18	0.94	0.97	0.34	0.68	0.84	9.63
Secondary & Higher	0.06	3.23	-	-	0.02	2.34	0.00	3.60	0.43	1.47	0.05	12.65
Wealth quintile												
Low quintile	1.00		1.00		1.00		1.00		1.00		1.00	
Middle quintile	0.01	2.94	0.99	0.00	0.06	2.18	0.25	1.47	0.02	2.51	0.99	0.9
Upper quintile	0.00	4.92	0.01	3.44	0.00	3.28	0.00	3.13	0.00	4.14	0.99	0.7
Place of residence												
Rural	1.00		1.00		1.00		1.00		1.00		1.00	
Urban	0.04	0.46	0.00	0.07	0.00	0.25	0.00	2.28	0.24	0.69	0.44	0.39
Marital status												
Single	1.00		1.00		1.00		1.00		1.00		1.00	
Married	0.04	1.87	0.69	0.81	0.11	0.39	0.00	0.105	0.81	0.929	0.80	0.40
No of observation	300		441		321		753		301		173	

*Sig $P < 0.05$ not Sig if $P > 0.05$

For each variable in Table 2, we displayed the significant level of logistic regression using the Wald test, and odds ratios. Binary logistic regression was used to determine the factors that are more likely to influence young mothers' use of professional health providers for birth delivery care. The Wald test was performed to determine the contribution of each of the predictor variables. In this model, five variables, including, age, education, wealth index, place of residence, and marital status shows a statistically significant effect on young mothers' use of professional health providers for child delivery care in Kenya (age $P < 0.01$, education $P < 0.06$, wealth status $P < 0.000$, place of residence $P < 0.04$. Marital status $P < 0.04$). In Ethiopia four variables were found to be significant with the exception of marital status, age ($P < 0.01$), education ($P < 0.00$), wealth status $P < 0.01$ and place of residence $P < 0.00$). In Nepal three variables education, wealth status and place of residence show a statistically significant result of young mothers' use of professional health for child delivery care (education $P < 0.002$, wealth status ($P < 0.00$), place of residence ($P < 0.00$). In Bangladesh we found variables such as (education $P < 0.00$, wealth status $P < 0.00$, place of residence $P < 0.00$, marital status $P < 0.00$) as being very significant push factors. In Haiti, two variables also showed significant results (age $P < 0.01$, wealth status $P < 0.00$). In Guyana only one variable was statistically significant (education $P < 0.05$). For the odds ratio (OR) a value of less than 1 indicates that the more a young mother's age increases, the less likely she will report assistance of nonprofessional health providers at delivery. The odds ratio for young mothers' age nineteen years was 0.34 times more likely to use professional health providers for delivery than age fifteen to sixteen in Kenya. The result of the odds ratio was 2.34 in Nepal and 12.65 in Guyana among young mothers with secondary levels of education who reported assistance of professional health providers for delivery than those mothers with no education. The odds ratio (OR) for the wealth index was 4.92 in Kenya, 3.44 in Ethiopia, 3.28 in Nepal, in Bangladesh 3.13, and in Haiti 4.14. This shows that the wealthy are more likely to be assisted by professional health providers in child birth care than the poor (Table 2). Young mothers who reside in urban areas are more likely than those residing in rural areas to be assisted by professional health providers at delivery (odds ratio is 0.46 in Kenya, 0.07 in Ethiopia, 0.25 in Nepal, and 2.28 in Bangladesh) (see Table 2). From these findings, it is clear that, place of residence, education and wealth quintile play an important role in influencing the use of health providers for delivery in these countries.

Table 3: Binary Logistic Regressions enter method between the uses of professional health prenatal care and selected independent variables (DHS 2005-2010).

Countries	Kenya 2008-9	Ethiopia 2005	Nepal 2006	Bangladesh 2007	Haiti 2005-6	Guyana 2009						
Variable	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)	Sig	Exp (β)		
Age group												
15-16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		
17-18	0.24	2.77	0.63	1.62	0.76	1.19	0.55	1.15	0.41	2.20	0.23	2.43
19+	0.33	2.33	0.97	0.96	0.69	1.25	0.41	1.22	0.63	1.56	0.19	2.82
Level of education												
No education	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	0.16	3.63	0.97	0.96	0.50	1.25	0.11	1.55	0.01	8.14	0.51	2.11
Second & higher	0.15	5.68	0.36	2.19	0.15	1.67	0.00	2.45	0.09	8.33	0.22	3.64
Wealth quintile												
Low quintile	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Middle quintile	0.96	0.94	0.99	3.3	0.33	1.39	0.93	1.42	0.26	3.84	0.99	3.4
Upper quintile	0.55	0.58	0.55	1.66	0.02*	2.27	0.00	2.72	0.07	9.17	0.26	3.56
Place of residence												
Rural	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Urban	0.02	5.24	0.65	1.77	0.00	0.15	0.00	0.32	0.09	3.64	0.91	0.90
Marital status												
Single	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Married	0.32	1.94	0.04	5.18	0.19	2.46	0.02	0.50	0.66	0.70	0.49	0.67
Number of observation	300	441	321	753	301	173						

*Sig $P < 0.05$ not Sig if $P > 0.05$

Table 3 consists of exploratory factors that are more likely to influence the use of professional health providers for prenatal care and a set of variables in the model. The findings from the logistic regression show a statistical significance between the use of professional health providers and place of residence in Kenya ($P < 0.02$). The odds ratio (OR) for young mothers from urban areas was 5.24 more likely than those from rural areas. In Ethiopia only one variable (marital status) was found significant ($P < 0.04$), and the odds ratio showed that married women were 5.17 times more likely than single to receive prenatal care from professional health providers. In Nepal two variables were significant (wealth index ($P = 0.01 < 0.05$), place of residence $P = 0.00 < 0.05$). Young women from the higher household wealth index were 2.26 times more likely to get prenatal care from professional health providers. Four variables were statistically significant in Bangladesh (education $P = 0.00$ with the odds ratio 2.45, wealth index $P = 0.00$ and the odds ratio 2.72, place of residence $p = 0.00$ odd 0.32, marital status $p = 0.02$ odds ratio 0.5).

Discussion

The higher level of the use of professional health providers for Prenatal care was highest in Kenya. This could be due to the fact that Kenya has a strategy called the Kenya Essential Package for Health (KEPH). A component of this strategy was continuing education which is assumed to reduce fragmentation and improve continuity of care, and this strategy emphasizes the interconnection of the various phases in human development, including attention during pregnancy to improve the chances of safe delivery (KNBC, 2009). Between household status and the use of professional health providers for prenatal care, a significant relationship was found in Nepal, Bangladesh, and Guyana. These findings are consistent with those found in another study (Peters et al., 2008). Both married and single women in Guyana, Haiti, Bangladesh and Ethiopia exhibit a similar level of receipt of Prenatal care from professional health providers (see figure 1). This indicates a non-existence of health education in these societies. These findings are supported by other studies in India that found a low utilization of Prenatal care services among young never married women (Singh et al., 2012) and these findings are consistent with those found by a study in Ethiopia and developing countries (Mekonnen & Mekonnen, 2003; Simkhada et al., 2008). These findings are consistent with the findings from other studies (Van et al, 2006) and are also consistent with a study done by (Alexandre et al., 2005) that demonstrates that education was associated with Prenatal care attendance, and decision making seeking prenatal care from professional providers. On the other hand, result suggest a low level of professional health assistance during birth delivery in Nepal and Bangladesh; and the use of professional health providers for prenatal care was lowest in Ethiopia at 14.4%. This low rate of professional health providers' use during pregnancy in Ethiopia can be explained by the almost non existing health education on the subject, weak health care system and infrastructure (Chaya, 2007), or to the fact that traditional medicine is given high priority and is considered an integral part of the health system in Ethiopia (Woldemicael et al., 2010). The rate of professional health providers' use for delivery was 12.65 %. These findings are consistent with those reported in a study done in Ethiopia. Teferra et al. (2012) that found that about 12.1% delivered in health facilities and 87.9% gave birth at home. 80.0% of them were assisted by family members and relatives. This result shows a vacuum needed to be filled by

health educators. Using the Chi-square test it was found that education, wealth index and place of residence had a statistically significant relationship with a young mother's use of professional health providers in Ethiopia. The education needed in this respect must have a special curriculum. The Chi-square results show a significant relationship between household status and professional assistance at delivery in all six countries. Chi-square test in Ethiopia, indicated that education, wealth index and place of residence showed a significant relationship with the assistance of professional health providers' at delivery while in Kenya no variable was found to be significant for the use of professional health providers in child delivery care. The higher use of professional health providers for birth delivery in Kenya can be explained by the abolition of fees at health care dispensaries and health centers, which encouraged women to use health services (Carrin et al., 2007). The highest level of professional health providers' use for birth delivery was in Guyana but when testing the relationship using the Chi-square test only one variable was found to have a significant relationship with the young mothers' use of professional health provider for delivery and that was the wealth index. The use of professional health providers during delivery for women in the upper wealth quintile were significantly more likely to be assisted by professional health for delivery and prenatal care. Age, education, place of residence and marital status did not show any statistical significance. The lower level of professional health providers' among young mothers in Nepal could be due to the shortage of health educators, skilled health providers, and the weak health system and limited access to basic maternal health care through a poorly developed transportation system (Shankar, 2010; Witter et al., 2011). Overall the Chi-square results suggests that in Kenya, Ethiopia, Nepal, Bangladesh, and Haiti education, the wealth index and place of residence have a significant relationship with the use of professional health providers for delivery and are good predictors of birth assistance among young mothers (Table 1). These findings are consistent with a finding reported in a study (Hale et al., 2009) that found that educated women are aware of the benefits of health care and are more likely to use health services. This can be explained by the fact that education improves the ability to afford the cost of health care, and their enhanced level of autonomy results in improved ability and freedom to make health-related decisions, including choice of which maternal services to use (Celik et al., 2000). Table 2 presents the logistic regression models of the use of professional health providers for birth delivery. Results indicate that age was significant in influencing the outcome for Kenya, Ethiopia and Haiti. The model also explained that urban women were more likely to be assisted by professional health providers in birth delivery than were rural women in Kenya, Ethiopia, Nepal, and Bangladesh. Guyana and Haiti society are mainly rural or semiurban. The level of household wealth quintile was also found to be positively associated with the young mother's use of professional health providers. The higher the level of wealth index, the more likely young women will report having the assistance of professional health providers. The Logistic regression model of wealth quintile and professional assistance at delivery shows that the test was significant for Kenya, Ethiopia, Nepal, Bangladesh, and Haiti. As for prenatal care the test was significant in Nepal, and Bangladesh. These findings are consistent with those found by other authors. Mills et al. (2008) showed that women on the upper index of the wealth quintile are more likely to seek professional delivery assistance than those on the lower index. Age in Table 3 did not show a significant level with the use professional health

providers for prenatal care in any of the countries. The model of prenatal care providers shows a significant relationship in Kenya, Nepal, and Bangladesh. These findings are consistent with those reported in some studies (Navaneetham & Arunachalam, 2002; Ochako et al., 2011) that showed that women residing in urban areas were more likely to use modern health care than those residing in rural areas. In all, six countries, education was positively associated with the use of professional health providers in Prenatal care.

Conclusion

The six selected countries are within the same levels of development and have gone through a substantial Health Care reform focused on Women and Children. Furthermore, they have the same statistics in terms of socioeconomic livelihoods. Socioeconomic indicators in the selected countries are propelled by weak institutional capacity, inadequate access to training, techniques and tools for development, limited access to basic services such as education, health care and sanitation and increasing exposure to the effects of climate change and rising sea levels. In addition, there is a history of social and political conflict in the countries, causing instability and limiting development progress. Although the DHS series present a wealth of information, some limitations are associated with the surveys which may affect the results. First is recall bias. Information collected about the use of professional health providers is based on women's recall of events which may be affected by the period of recall as well as the women's situation at the time of the event. Our analysis focused on the last birth in the past five years as it was expected that young mothers are more likely to misreport events from their earlier births. The utilization of maternal health services is related to demographic factors. Some of these factors were discussed in the paper. The paper also identified the level of education, wealth index and place of residence as influencing maternal care services. Marital status did not have much impact. Health care policy makers frequently discuss regional disparities in the delivery of health care services. With respect to this equity issue, the finding of this regarding the young mother's use of health care services in developing, young mothers' education and household income is very relevant. At the policy level, this study suggests increasing young women's participation in education, which will not only show a long-term positive effect on their use of maternal health care services, but would also improve many other aspects of health and health care in developing countries. The main results confirmed the null hypotheses of the impact of education levels, place of residence, and households' wealth quintile. The results from the Chi-square test show significant relationships between levels of education, wealth status, place of residence and professional health providers in Kenya, Ethiopia, Nepal, Bangladesh, Haiti and Guyana. These variables show that a high proportion of wealthy, educated and urban young mothers were more likely to use professional health providers during pregnancy and for birth delivery than poorer women, uneducated and those from rural areas. These findings suggest that these factors cited should be the target of interventions aimed to increase the use of skilled health providers in these countries. Maternal health care education should be higher in the priorities of health educators in developing countries. Policy regarding young women's education should be strengthened since education is a strong predictor of factors which influence young women's use of health providers. Health education for young women would not only teach prevention and basic health knowledge, but would also condition their ideas

and re-shape everyday habits and lifestyle in terms of prenatal and natal care in developing countries. This type of conditioning not only affects the immediate recipients of such education, but also future generations will benefit from an improved and properly cultivated ideas about health that will eventually be ingrained with widely spread health education. Further empowering young women through health education will improve their economic and social status, while helping them to secure livelihoods and increase their decision making power. Also, the inequality regarding the use of professional health providers may impact on those from a poorer background and rural areas. Policy makers should therefore take into account rural young mothers with regard to creating opportunities in their locations to deliver at health facilities. Furthermore, households and communities should be enlightened and their consciousness increased in understanding how best to access health care in their various jurisdictions for maximum positive impact on their socioeconomic status. As a palliative, we argue that a proper health education mechanism is required for safety net measures in developing countries, which would reduce the current negative effects of non-use of health providers, more especially for the vulnerable.

Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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