Determinants of Postnatal Care Services Utilization in Pakistan- Insights from Pakistan Demographic and Health Survey (PDHS) 2006-07

[1]Asma Yunus, [1]Sarosh Iqbal, [1]Riffat Munawar, [2]Rubeena Zakar,
[1]Shahzad Khaver Mushtaq, [1]Fozia Sadaf and [1]Ahmad Usman

[1]Institute of Social and Cultural Studies, University of the Punjab, Pakistan
[2]University of Sargodha, Pakistan

Abstract: *Background*: Pakistan is amongst the countries with high rates of maternal and neonatal mortality. Most of the deaths occur at the time of childbirth or immediately in the period after birth due to low utilization of routine postnatal care (PNC). There is scarcity of literature on determinants and impeding factors of PNC services utilization in Pakistan. This paper provides a holistic view and investigates the association of PNC services utilization with socio-demographic and delivery assistance related characteristics. *Methods*: The study used data from 2006-07 Pakistan Demographic and Heath Survey (PDHS), a nationally representative sample of 10,023 women aged 15-49 years. Our analysis was limited to the last birth during five years preceding the survey, total of 5,724 women. For measuring the PNC utilization, four variables i.e., utilization of PNC services, newborn PNC within 2 months, timing for PNC checkups and obstetric complications faced during PNC were combined. To check the association among the determinants of PNC, socio-demographic and other assisting variables certain momentous statistical techniques like Univariate, Bivariate and Multivariate logistic regression analysis were applied. *Results*: The analysis of data showed that about 64% women received some ANC for their last born child and among them about half received ANC in the first trimester. About 42% received health professionals' assistance during delivery; only 36.9% delivered in a health care facility. The findings revealed that women's place of residence like urban or rural played significant role in the whole problem of the research mainly due to its relationship with education and socio-economic status.. The results also shown that women's level of education i.e., more than ten years of schooling versus no schooling (AOR 5.16, 95%CI 3.18-9.98), high socioeconomic status than low status (AOR 5.69, 95%CI 4.27-7.58), economically developed regions than less developed ones (AOR 2.89, 95%CI 2.25-3.71), having two or less children than five or more children (AOR 2.08, 95%CI 1.83-2.38) and having a history of abortion than no abortion (AOR 1.51, 95%CI 1.25-1.82) were significantly associated with ANC utilization. Similarly, all these variables were significantly associated with ANC utilization in the first trimester, delivery assistance by health professionals and delivery in a medical facility. *Conclusions*: The research found that women live in developed provincial settings with higher education, living in urban and prosperous areas, having fewer children and have more access to health services were more likely to use PNC services. The results may be useful for policymakers to develop efficient strategies to improve the health care services utilization in Pakistan.

Key words: Pakistan · ANC utilization · PNC services · PDHS

INTRODUCTION

Pakistan ranks sixth most populous country in the world. In 2008, 50% of maternal deaths occurred only in six countries around world and unfortunately Pakistan was one of them. Statistics shows that a woman dies every 20 minutes in Pakistan due to maternal causes [1]. Similarly, for every 1,000 children born, 45 don't live long beyond their first 28 days of life and 77 don't see their first birthday [2]. Pattern of under five child mortality shows that over half of deaths occur during neonatal period (i.e. first 28 days) and 26% occur during postnatal

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Corresponding Author: Asma Yunus, Institute of Social and Cultural Studies, University of the Punjab, Pakistan.

period and higher in rural areas [3]. The highest risk of death for both the mother and newborn occurs at the time of childbirth or immediately in the period after delivery [4]. More than 60% of maternal deaths occur in the first 24 to 48 hours after childbirth whereas rest occur during the first week after delivery and nearly 4 million new-borns((10,000 per day) die annually [5] worldwide; three quarters of these deaths take place within one week of birth and up to 2 million die during the first day following birth.

Pakistan is lagging behind in achieving Millennium Development Goal (MDG 5) to reduce maternal and neonatal mortality by 2015. The country has one of highest rate of Maternal Mortality Ratio (MMR) of 276 per 100,000 births has wide rural urban difference (319 for rural and 175 for urban areas). According to a rough estimate, one in 89 women die in Pakistan due to maternal causes during her lifetime [2] Postpartum haemorrhage is the leading direct cause followed by puerperal sepsis and eclampsia [6].

Postnatal period is defined as the first six weeks after birth and is critical to the health and survival of both a mother and her newborn. The first two days after childbirth are critical for monitoring delivery related complications. [7]. Thus a postnatal visit is ideal time to educate mother and it is recommended that all women receive at least three to four postnatal checkups as per WHO guidelines. Lack of care in this time period may result in death or disability as well as missed opportunities to promote healthy behaviours, affecting women, new-borns and children [8].

Regardless of this fact that most of maternal deaths and disabilities occur during PNC period; postpartum care remains the most neglected phase of obstetric services [9]. Almost all cases of maternal mortality are preventable. An estimated 74 per cent of maternal deaths could be averted if all women had access to the interventions for preventing or treating pregnancy and birth related complications (, in particular emergency obstetric care [10].

In Pakistan, women generally do not attend the institutionalised facility for routine PNC consultations, except of only serious and fatal complications that compel them to make contact with hospitals [9]. Only 23% of the women visit health care providers to seek routine PNC [11]; thus a significant number of maternal morbidities in the puerperium remain un-diagnosed, neglected or mismanaged [12]. The 2006-07 Pakistan Demographic and Health Survey (PDHS) showed that approximately 64% of

women received antenatal care (ANC) while only 24% received a PNC check-up within six weeks of delivery during their last pregnancy in the same year.

The care of healthy women and their babies is most likely to be provided by healthcare providers in health facilities, midwifes, traditional birth attendants, health visitors and private practitioners. Factors for not seeking care have been thought to be traditional health beliefs and poor accessibility, availability and affordability of healthcare service, child birth order, illiteracy and household wealth quintile.

Significance of Study: There have been very few studies [13] on health seeking behaviour in Pakistan [14] and even most least conducted on post natal care and even rare studies conducted in the country, using PDHS data on determinants of PNC in Pakistan.

The objectives of this study were;

- To determine the relationship between.
- PNC Utilization with socio-economic status of Mothers.
- Obstetric complications with type of delivery assistance.
- To explore association of PNC utilization with place and type of delivery assistance.

Based upon the above objectives, following hypotheses were put up for study:

- Low socio-economic status is associated with non utilization of PNC;
- There is a relationship between type of delivery assistance and PNC Utilization; and
- There is a relationship between type of delivery assistance and nature of obstetric complications.

MATERIALS AND METHODS

Source of Data: This study used secondary data from the 2006-07 PDHS, a publicly available and nationally representative survey of 10,023 women aged 15-49 years. Through adopting a two-stage, stratified, random sampling technique, PDHS illustrated direct estimation and impeding factors of maternal and neonatal morbidity and mortality including antenatal, natal and post-natal care and treatment of pregnancy complications, at national level for the very first time in Pakistan [3].

This study covered the sample of 5,724 women who gave births during last five years preceding the survey. The main source of the secondary data was the PDHS (2006-07) [3] reports; however various articles and published reports were also consulted. Since the study involved secondary analysis of publicly available data, thus there was no obligation of ethical clearance.

Study Variables: The study has four dependent variables, three of them defined as two-category and one as three-category ordered variables: First dependant variable was 'Utilization of PNC services' derived from following questions: "Anyone checked respondent before discharge/delivery?" and "Anyone checked respondent after discharge/delivery?" and coded into utilized and Non-utilized. Second variable 'Timing for PNC visit/check-up' was defined into three-category, considering WHO guidelines on PNC which recommends 3-4 PNC visits depending on local context [15]. Since the majority of maternal and newborn deaths take place during the first few hours and days after birth [15], so it was recoded as of visited within first-24 hours, 2-6 days and 7-42 days. Third variable 'Newborn PNC within 2-months' was defined as Yes/No. Fourth variable 'Obstetric complication faced during PNC' was computed into two-category i.e. Severe & Minor complications where former was extracted from following: 'during delivery or after birth, experienced heavy vaginal bleeding, high fever, Severe headache, Blurred vision, Swelling of hands and face, Fits/convulsions and Inability to control bowel motions'.

Twelve independent variables including socio-demographic and type of delivery assistance were selected for study to examine the influencing factors of PNC. It included provincial distribution; urban-rural classification; mothers' age (coded as 15-29years, 30-44years and 45<above); education status of mothers and fathers (both coded as educated and uneducated); and available means of transportation for household was defined by following questions: 'Has bicycle, motorcycle/scooter, car/truck' into two-category (own vehicle capable to transport mother and no own vehicle). Since DHS do not collect data on income or expenditures, thus wealth index was defined by the household possessions, amenities and dwelling characteristics, using principal component analysis and was recoded into poor, middle and rich. Others variables included utilization of ANC (coded as ANC check-up and no ANC check-up) and birth order of child (coded into four-category as first

order, 2-3order, 4-6order, 7and more births). Variable of place of delivery was coded into three-category i.e. at home (mothers' home or others home), hospital/facility (BHU/RHC/THQ/DHQ)-both public/private and others and Type of Providers for PNC was recoded into 3 categories i.e. Doctors, Paramedics (LHW/LHV, Nurse, Midwife) and Traditional Healers (Dai/TBAs, Hakim, Homeopath).

Methods of Analysis: In order to achieve objective of the study, univariate, bivariate and multivariate logistic regression were employed for data analysis. In the univariate analysis, distributions of respondents by key socio-demographic variables were expressed as percentages. While at the bivariate level, frequencies and cross-tabulations were used to identify the distributions of dependent variables by selected characteristics. Chi-square test of association was applied to test the statistical significance of bivariate distributions of dependent variables across independent variables. Multivariable logistic regression analysis was also used to assess the association between PNC utilization and others variables.

RESULTS

Sample Description: Table 1 shows the characteristics of study sample of 5,724 women. Results show that nearly 40% of the respondents belong to Punjab province and 65% from rural areas. About 52% of mothers' population was from 15-29 age groups and approx two thirds were uneducated; however 63% of fathers were educated. The proportion of mothers with poor status was higher (44%) as compare to rich (36%) and about 51% have no own vehicle to transport mothers.

Socio-Demographic: Table 2 presents the bivariate analysis of socio-demographic variables against four dependant variables.

Results show that region has a significant relationship with PNC utilization of mothers and newborn and also with timing and complication of PNC ($p \leq 0.000$). Likewise, place of residence was also associated with mothers and newborns PNC utilization ($p \leq 0.000$) ($P \leq 0.005$). Younger women of age 15-29 are more likely to utilize PNC services for themselves and also for newborn, paying routine PNC visit but are also at high risk of complication. Education status of Mothers and Fathers is strongly associated with PNC utilization. Educated women

Table 1:   Sample Socio-Economic characteristics of Mothers who gave birth during last 5 years (N=5,724)

Characteristics	Frequency (f)	Percentage (%)
Region		
Punjab	2,305	40.3
Sindh	1,626	28.4
Khyber Pakhtunkhwa	1,113	19.4
Baluchistan	680	11.9
Type of Residence		
Urban	1,998	34.9
Rural	3,724	65.1
Mother's age at birth		
15-29	3,025	52.8
30-44	2,550	44.5
45> (above)	149	2.6
Mothers' Education		
Educated	1,913	33.4
Un-educated	3,811	66.6
Fathers' Education		
Educated	3,636	63.5
Un-educated	2,088	36.5
Wealth index		
Rich	2,028	36.4
Middle	1,118	19.5
Poor	2,524	44.1
Available means of Transportation		
Own vehicle	2,811	48.8
No own vehicle	2,682	51.2

Table 2: Socio-Demographic determinants of Mothers utilizing PNC services (N=5,724)

Characteristics	Utilization of PNC (%)	P[+]	Newborn PNC within 2 months (%)	P[+]	Within first 24 Hours (%)	Within 2-6 days (%)	Within 7-42 days (%)	P[+]	Minor (%)	Severe (%)	P[+]
Region											
Punjab	38.0	0.000	33.4	0.000	52.6	22.4	19.1	0.000	53.7	31.7	0.000
Sindh	39.1		42.8		38.1	51.7	38.8		19.3	34.3	
Khyber Pakhtunkhwa	13.0		17.3		7.6	18.6	29.8		21.4	18.2	
Baluchistan	9.9		6.6		1.7	7.2	12.4		5.7	15.8	
Type of Residence											
Urban	44.8	0.000	30.3	0.005	30.2	30.8	30.9	0.076	35.6	34.5	0.650
Rural	55.2		69.7		69.8	69.2	69.1		64.4	65.5	
Mother's age at birth											
15-29	56.9	0.000	57.5	0.003	56.4	57.8	59.0	0.061	52.3	53.4	0.057
30-44	41.4		40.2		42.6	39.5	37.1		45.6	43.7	
45> (above)	1.6		2.3		1.0	2.7	3.9		2.1	2.9	
Mothers' Education											
Educated	46.5	0.000	30.4	0.000	34.0	27.8	30.3	0.178	37.2	30.9	0.000
Un-educated	53.5		69.6		66.0	72.2	69.7		62.8	69.1	
Fathers' Education											
Educated	72.7	0.000	66.1	0.000	70.4	65.4	58.4	0.035	65.9	61.9	0.007
Un-educated	27.3		33.9		29.6	34.6	41.6		34.1	38.1	
Wealth Index											
Rich	50.0	0.000	31.0	0.000	34.7	26.6	31.5	0.006	40.8	33.6	0.000
Middle	18.2		20.6		23.0	20.2	18.5		19.8	19.3	
Poor	31.9		48.4		42.3	53.2	50.0		39.4	47.1	
Available Means of Transportation											
Own vehicle	55.7	0.000	48.2	0.032	56.4	42.7	43.8	0.002	54.4	49.2	0.001
No own vehicle	44.3		51.8		43.6	57.3	56.2		45.6	50.8	

[+]Chi-square test has been applied

Table 3: Characteristics of PNC Service Utilization and Type of Assistance (N=5,724)

Characteristics	Utilization of PNCs (%)	P[+]	Newborn PNC within 2 months (%)	P[+]	Timing for PNC check up Within first 24 Hours (%)	Within 2-6 days (%)	Within 7-42 days (%)	P[+]	Complications faced during PNC Minor	Severe	P[+]
Birth order											
1	19.3	0.000	16.2	0.000	13.7	17.5	19.7	0.405	17.4	17.2	0.000
2-3	37.4		31.4		32.6	30.8	29.2		36.1	31.4	
4-6	30.5		35.9		35.7	36.9	34.3		31.3	32.3	
7+	12.8		16.5		17.9	14.8	16.9		15.1	19.0	
Utilization of ANC service											
ANC Checkups	81.0	0.000	71.8	0.000	70.8	71.3	74.9	0.000	61.9	65.9	0.000
No ANC Checkups	19.0		28.2		29.2	28.7	25.1		38.1	34.1	
Place of delivery											
At Home (*Mother's home or others home*)	40.9	0.000	96.4	0.000	96.2	97.3	94.9	0.000	63.0	62.8	0.000
At Hospital (*Public or Private*)	59.1		3.4		3.4	2.3	5.1		37.0	37.1	
Place of first PNC Check up											
At Home (*Mother's home or others home*)	40.9	0.000	96.4	0.000	96.2	97.3	94.9	0.000	63.0	62.8	0.000
At Hospital (*Public or Private*)	59.1		3.4		3.4	2.3	5.1		37.0	37.1	
Type of Providers											
Doctor	47.7	0.000	54.4	0.000	21.3	71.1	84.3	0.000	4.7	8.7	0.000
Paramedic	6.0		7.8		10.0	6.1	6.7		0.9	1.1	
Traditional Healer	0.7		35.5		68.0	19.4	5.6		4.3	4.9	
Others	0.2		2.1		0.7	3.4	2.8		0.3	0.3	
None	45.5		0.1		0.0	0.0	0.6		89.8	85.1	

are less likely to avail PNC services and also have less cases of PNC complication as compare to uneducated women. The relationship of household wealth index with PNC utilization both for mothers and newborn, following the Timing and complication is also very significant (p≤0.000). However, there is variant in significance level of respondents, occupying own vehicle as relationship of means of transportation is significant with mothers' PNC utilization (p<0.000), Timing for PNC visit (p≤0.002) and also with PNC complications (p≤0.001).

PNC Service Utilization and Type of Assistance: Table 3 describes the relationship of various characteristics of services and type of assistance provided. Analysis shows that birth order of child has a significant relationship with PNC utilization and also with complications (p≤0.000). Women were more likely to avail PNC services with increase of child birth, however it decreased with 7 and more births. Those proportion of respondents with high ANC utilization, were more prone to avail PNC service, following routine PNC visits but also more vulnerable to complications as well. Most of the women delivered at hospital utilized PNC while women who delivered at home utilized less PNC and suffered more with complication, although they paid routine PNC visits. Women are more

likely to attend doctors for PNC utilization of mothers and newborn as compare to paramedics and traditional healers, while in case of complications, they don't seek treatment from anyone.

Associating Factors of PNC Utilization: Table 4 highlights the factors associated with the utilization of PNC services with bi-variate and multivariate differential against selected socio-demographic and services characteristics. Bivariate and Multivariate results for PNC utilization reiterate that some important factors such as women's age, education, household economic status, residential classifications, birth order, ANC utilization and timing of PNC visits were found to be significant determinants of PNC in Pakistan. Women with higher age group were (AOR=0.976 CI=0.849-1.121) and (AOR=0.527 CI=0.527–1.175) less likely to utilize PNC services than younger women. Moreover, the odds of receiving PNC among educated women (AOR=2.238, CI=1973–2.539) and belonging to rich quintile (AOR=1.556 CI=1.339-1.808) were high. The birth order of child showed a significant positive effect on PNC utilization. Women with two to six birth orders of children are more active in availing PNC services (AOR=1.466 CI=1.200-1.791) (AOR=1.466 CI=1.163-1.848). Similarly, women who had utilized ANC

Table 4: Association of various Service Utilizations determinants of PNC among mothers 15-49 years in Pakistan with Binary and Multivariate Logistics regression (N=5,724)

| | Utilization of PNC | | | |
| | Bi-variate | | Multi-variate | |
Characteristics	OR	95% CI	AOR	95% CI
Mother s Age				
15-29 (Ref)				
30-44	0.770*	0.692-0.856	0.976*	0.849-1.121
45> (above)	0.423*	0.293-0.610	0.527*	0.527-1.175
Type of place of residence				
Rural (Ref)				
Urban	2.175*	1.947-2.429	1.744*	1.546-1.966
Education Status of Mother				
Uneducated (Ref)				
Educated	2.881*	2.572-3.227	2.238*	1.973-2.539
Wealth Index				
Poor (Ref)				
Middle	1.487*	1.285-1.721	1.131*	0.955-1.341
Rich	3.271*	2.897-3.693	1.556*	1.339-1.808
Means of Transportation				
No own vehicle (Ref)				
Own vehicle capable to transport mother	1.378*	1.238-1.533	1.143*	1.021-1.280
Birth order				
7+ (Ref)				
4-6	1.508**	1.238-1.773	1.466**	1.163-1.848
2-3	2.042**	1.740-2.396	1.466**	1.200-1.791
1	2.021**	1.685-2.424	1.269**	1.062-1.515
Utilization of ANC				
Yes (Ref)				
No Utilization	0.247*	0.219-0.279	0.510*	0.441-0.590
Place of first PNC Check up				
At Hospital (Public or Private) Ref				
At Home (Mother's home or others home)	5.858*	5.206-6.591	6.119*	5.310-7.052
Timing for PNC check up				
Within first 24 Hours (Ref)				
Within 2-6 days	0.190*	0.126-0.288	0.149*	0.097-0.231
Within 7-42 days	0.167*	0.124-0.225	0.074*	0.054-0.101
Complications				
Minor Complications(Ref)				
Severe Complications	1.376*	1.235-1.533	0.688***	0.071-6.626

*P≤0.000 and ** P≤0.002 and ***P≤0.746 (not significant)

services were more likely to utilized PNC (AOR= 0.510, CI=0.441–0.590). The timing of PNC visits within first 6 days (AOR= 0.149, CI=0.097–0.231) and within six weeks (AOR= 0.074, CI=0.054–0.101) also has significant relationship with PNC utilization.

DISCUSSIONS

This study was aimed to explore the determinants of PNC utilization among women in Pakistan using data from the PDHS 2006-07. Specifically, socio-demographic and service related indicators were investigated to highlight the influencing factors affecting PNC coverage in Pakistan, resultantly increasing maternal and neonatal mortality. Postnatal care is considered a critical time for both mothers and newborns, enabling health personnel to identify post-delivery complications on time and to provide treatments promptly [16]. Despite the benefits of PNC, the majority of women don't practice routine PNC checkups and suffered with severe complications. This could be due to their low socio-demographic status and the fact that many of them have unplanned pregnancies [17].

Over all PNC utilization in mothers and babies is highest in Sindh and lowest in Balochistan province. First PNC utilization is higher in Punjab & lowest in Balochistan while frequency of 2nd & 3rd PNC is higher in Sindh. Complications in Obstetric history are more severe in Sindh & less in Balochistan and Utilization of mother & child PNC is more frequent in rural areas Number of PNC visits are higher among rural females with more severe complications [6]. Mother's age (15-29) has higher PNC visits as compared to least frequency in (45 & above), same for baby PNC [18]. Severe complications are observed more in age (45 & above). PNC utilization was observed more in uneducated sample with a higher number of complications [19].

The rich stratum had a higher PNC utilization and less severe complications as compared to the poor [19]. The sample having means of transportation has higher PNC utilization. It is interesting to note that baby PNC is more frequent among those having no vehicle Hospital delivery is associated with the higher utilization of PNC while new born PNC was found more frequent in home delivery [20]. PNC utilization increases with birth order 2-3 while decreases with 7-more [18]. In case of severe complications, the women with institutional delivery were less likely to consult doctor. Poor doctor patient relationship may be its reason. Odds of mothers with severe obstetric problems for PNC utilization are higher than with minor ones Women having birth order <4 have a higher PNC Utilization than with other birth orders. Odds ratio of institutional delivery is higher for PNC than home delivery Yet regarding 1st PNC utilization OR of mothers with home delivery is higher PNC utilization by rich and urban mothers is higher as compared to poor and rural mothers [21].

The use of PNC was low compared to the use of ANC and delivery at a facility. Parity, mother's education and household wealth were important determinants of PNC use [22]. Programmatic factors had relatively low impact on a woman's making a PNC visit: exposure to the mass media was the only program variable associated with a PNC visit [23-27]. Obtaining PNC appears to be a low priority for women in rural areas. Efforts to increase PNC use have had relatively little impact in Pakistan.

CONCLUSION

For the very first time, our paper has scrutinized the association between PNC utilization and maternal and neonatal mortality in Pakistan using a nationally representative population-based dataset of PDHS.

Findings have revealed quite interesting facts which needs attention and also important policy lessons to be learnt. Socio-economic status is a major determinant of PNC utilization where young mothers are more prone to avail PNC services. Factors influencing the services involve preference for hospitals and doctors for PNC services. It is also evident that poor and uneducated women suffer more with severe complications and don't seek treatment/advice from healthcare providers.

Thus there is a need to devise such strategies, ensuring availability, accessibility and affordability of PNC for mother and newborn despite of difference in geographical boundaries. Emphasis should be given on designing public health interventions to educate and raise awareness among mothers and families regarding importance of PNC, timing for PNC check-up and timely diagnosis of PNC complication.

Limitations: There was one considerable limitation for the study as the PDHS data is cross-sectional in nature, thus it's not possible to infer robust conclusions on the effects of the selected covariates.

REFERENCES

1. Qureshi, Mirani and Hirani, 2006. The long distance between promises and realities. Social Watch Pakistan.

2. National Institute of Pakistan Studies, 2004 National Institute of Population Studies (NIPS) [Pakistan] and Macro International Inc, (2008). Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan: National Institute of Population Studies and Macro International Inc.

3. Pakistan Health and Demographic Survey (PDHS) 2006-07, National Institute of Population Studies, Islamabad, Pakistan June 2008.

4. Hunte, P. and F. Sultana, 1992. Health seeking behaviour and the meaning of medications in Balochistan, Pakistan. Soc. Sci., 34: 1385-1397.

5. Lawn, J.E., S. Cousens and J. Zupan, 2005. Neonatal Survival 1: 4 million neonatal deaths: When? Where? Why? Lancet, 365: 891-900.

6. Fort, A., M. Kothari and N. Abderrahim, 2006. Postpartum care: levels and determinants in developing countries. Calverton, MD, USA: Macro International Inc.

7. Stephenson, R. and M. Hennink, 2004. Barriers to family planning service use among the urban poor in Pakistan. Asia. Pac. Popul. J., 19: 5-26.

8. UNICEF, 2004. Maternal Mortality. The Challenge. Retrieved from http://www.childinfo.org/areas/maternalmortality/.

9. Bibi, S., S. Ghaffar, S. Memon and S. Memon, 2012. Severe acute maternal morbidity (SAMM) in postpartum period requiring tertiary Hospital care. Iran J. Reprod. Med., 10(2): 87-92.

10. Wagstaff, A. and M. Claeson, 2004. The Millennium Development Goals for Health: Rising to the Challenges, World Bank.

11. Khan, Y.P., S.Z. Bhutta, S. Munim and Z.A. Bhutta, 2009. Maternal health and survival in Pakistan: Issues and Options, 31: 920-929.

12. Hasan, D. and A. Khanum, 2000. Health care utilization during terminal child illness in squatter settlements of Karachi. J. Pak. Med. Assoc., 50(12): 405-9.

13. Shaikh, B. and U. Hatcher, 2004. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. Journal of Public Health, 27(1): 49-54.

14. Fatimi, Z. and I. Avan, 2002. Demographic, Socio-economic and Environmental determinants of utilization of antenatal care in rural setting of Sindh, Pakistan. J. Pak. Med. Assoc., 52: 138-142.

15. WHO, 2005. The World Health Report. Make Every Mother and Child Count, Geneva, Switzerland: World Health Organization.

16. Yesudian, P.P., 2005. Impact of women's empowerment, autonomy and attitude on maternal health care utilization in India. Global Forum for Health Research, Forum, pp: 8.

17. Annet, N., 2004. Factors influencing utilization of postnatal services in Mulgan and Mengo hospitals Kampala, Uganda. [http://www.uwc.ac.za/library/theses/main_frame.htm]. (Unpublished M.Sc. thesis), University of the Western cape, Cape Town, South Africa.

18. Shariff, A. and G. Singh, 2002. Determinants of Maternal health Care in India: Evidence from a Recent Household Survey. In Working papers series 85 NCAER Publications, New Delhi, India.

19. Mumtaz, *et al*., 2012. Adressing disparities in Maternal Health care in Pakistan: Gender, Class and exclusion. BMC Pregnancy and Child birth [http://www.biomedcentral.com/1471-2393/12/80.

20. Khan, S. and D. Strobin, 2010. Maternal Health, What Matters: A study of individual and contextual factors related to maternal health care Utilization. Population Association of America, Annual meeting Progress.

21. Singh, A., S.S. Padmadas, U.S. Mishra, S. Pallikadavath, F.A. Johnson, *et al*., 2012. Socio-Economic Inequalities in the Use of Postnatal Care in India. PLoS ONE, 7(5): e37037. doi:10.1371/journal.pone.0037037.

22. Karim, M., 2002. Socio-economic, demographic and health situation inThatta District. Karachi.

23. Agha, S. and C.W. Carton, 2011. Determinants of Institutional delivery in Pakistan, International Journal of equity Health DOI: 10.1186/1475-9276-10-31

24. D'Souza, R.M., 2003. Role of health seeking behaviour in child mortality in the slums of Karachi, Pakistan. J. Biosoc. Sci., 35: 131-144.

25. Mumtaz, *et al*., 2012. Adressing disparities in Maternal Health care in Pakistan: Gender, Class and exclusion. BMC Pregnancy and Child birth [http://www.biomedcentral.com/1471-2393/12/80.

26. Sadiq, H. and A.D. Muynck, 2002. Health care seeking behavior of pulmonary tuberculosis patients visiting Rawalpindi. J. Pak. Med. Assoc., 51: 10-16.

27. World Health Organization, 2005. Postpartum Care of the Mother and Newborn: A Practical Guide.