Socio-economic Determinants of Maternal Healthcare Behaviour: Evidence from Pakistan

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Abstract:

Maternal healthcare behaviour is a complex behavioural phenomenon. Studies refer to maternal healthcare behaviour as a determinant of individual, household and social factors such as accessibility, affordability and awareness regarding health care. Using the Pakistan Demographic and Household Survey, 2012-13, the study aims to identify the socio-economic determinants of maternal healthcare behaviour of women in Pakistan. Women's health is a neglected area of study in Pakistan; particularly at household level thus this study will provide an insight into this sensitive area. Empirical estimation is carried out through simple econometric procedure. The econometric specifications followed in the study identify the potential variables that could influence pre and postnatal healthcare behaviour of women in Pakistan. The estimates of this analysis depict that mother's predisposing factors such as educational level, previous fetal loss experience; spousal educational attainment and economic status are important determinants of maternal health behaviour (MHB) in Pakistan.

Keywords: Socioeconomic, determinants, women behaviour toward health,

1. INTRODUCTION

Maternal healthcare behaviour (MHB) is a complex behavioural phenomenon. Previous literature on developing and developed countries suggest that maternal healthcare is an important factor in determining better and quality health products and outcomes for mothers [see, Elo, (1992); Midhet, Becker and Berendes (1998); Celik & Hotchkiss (2000);

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Haq and Arshad (2007); Amin, Shah and Becker (2010)]. Women die of pregnancy-related reasons every year, more than one each minute [WHO (2005); Lawn, *et al.* (2005); Christiana, *et al.* (2008)]. There is harmony in accepting that health is prerequisite for development and growth. Millennium Development Goals (MDGs) draw great attention to health. Three out of eight goals, eight out of 18 targets and 18 out of 48 indicators focus on health [WHO (2005)].

The lack of maternal care is considered as an important determinant towards maternal mortality. Conway and Kutinova (2006) suggest that timely prenatal care can have significant effect on mother's health, resulting in low level of maternal deaths, decreased obesity and hospitalization. Jewell (2007) found that in LDC, richer households tend to have higher demand for prenatal care. In Madagascar, around 35% of women were unable to access formal maternal care due to varying reasons such as large distance to health facility, believing that formal maternal care is unnecessary, lack of money and poor quality of care [Hernandez and Moser (2013)].

The Government of Pakistan has prepared wide-ranging attempts to diminish maternal mortality. There are wide-ranging maternal and child healthcare plans in Pakistan. Regardless of these progressive programs, the condition remains miserable. Though the upgrading for none of the MDGs is pleasing in meeting its target, one of the alarming and least satisfactory is the MDG 5[1]. The Maternal Mortality Ratio (MMR) in Pakistan is 276 per 100,000 live births in 2010 according to UNICEF, signifying the dismal state of reproductive health care in the country. At this rate, the goal of achieving MMR of 140 maternal deaths per 100,000 live births for Pakistan will not be achieved by the end of 2015 [Planning Commission (2010)].

Safe motherhood includes a chain of schemes, practices, procedures and service delivery guidelines planned to guarantee that women receive first-class maternal care, prenatal, delivery and family planning services. The pillars for safe motherhood are improved Absolute Neutrophil Count (ANC), guideline towards family planning, and delivery by skilled/professional and obstetric care. The main

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[1] MDG 5 is reduction in MMR by three-quarters between 1990 & 2015 and achieve universal access to reproductive health in 2015.

objective of this study is to estimate the impact of socioeconomic determinants on the well-being of mothers. Thus the study is specifically focusing on:

- To examine the impact of individual, household and community characteristics on visit to doctor during pregnancy.
- To identify the most significant factors that may affect prenatal care behaviour.
- To identify the determinants of postnatal care.

Thus the study is overall focusing on maternal healthcare behaviour, which include prenatal visit and other prenatal treatment (including tetanus injections, intake of iron tablets, etc.). Finally, the study will also identify the determinants of postnatal care.

2. REVIEW OF LITERATURE

Review of literature in this study is organized on geographical income basis, for instance, fist we present the review of literature from developed countries second, we focus developing societies and finally we also present the review of studies that attempt to study this phenomenon in Pakistan. Paringer (1983) analyzed that the absenteeism from work due to ill health is significant for both males and females in US. Poor health has larger impact on male work loss than it does on female work loss. The differential impact of health status on work loss for men and women may be due to the gender differences in cure of illness. Research indicates that women invest more in their own health by taking more preventive measures and medical services, which is also consistent with the longer life expectancy of women compared to men. Family responsibilities reduce the work loss especially among women. Married women show stronger determination towards work and stronger labour force participation due to dual responsibilities and they also tend to invest more in their health in order to lower illness rates.

Prenatal care for a western urban district of Turkey is analysed by Ciceklioglu, *et al.* (2005). The measures used to evaluate the content of services include number of maternal weight gain checks, measurement of blood pressure and fetal heartbeat measurements, guidance about healthy lifestyles, lab examinations, and tetanus inoculation.

Their study highlighted remarkable associations between the amount of prenatal care and individual features in addition to those among the content of care and type of care sources. Jewell and Triunfo (2006) investigated the impact of prenatal care on birth weight in Uruguay, South America. Their estimates find a positive impact of improved utilization of prenatal care on birth weight. A rise in Body Mass Index (BMI), parity, or age increases birth weight at a decreasing rate, where as a rise in cigarettes leads to a fall in birth weight at an increasing rate. They also found that an infant born to a poor mother gains more benefit from increased prenatal care.

Carolan and Frankowska (2010) examined the association between advanced maternal age (35-39 years) and undesirable prenatal outcomes in high-income countries. They estimated that women aged greater than 35 years were at a statistically significant increased risk for unexplained fetal loss compared to younger women and stillbirths rose as women aged without any clear cause. Higher education and higher socioeconomic status are linked with better prenatal and neonatal outcomes.

In case of developing countries, Bhatia and Cleland (1995) for south region of India found that there is significant impact of economic status, educational level and religion of mother on the MHB in the region. The analysis showed notable imbalance in utilization of antenatal and postnatal care as the postnatal care was taken by less than one fifth of the mothers. Regardless of antenatal checkups conducted by medical practitioners, most of the deliveries took place at homes.

Gawtkin (2000) investigated that poor population faces worse healthcare services and outcomes than the better off almost everywhere in case of developing regions. They found that the poor use less health-care services, have less satisfactory health-related behaviour and are at a drawback with respect to other determinants of health status. The inequality in utilization of health services and nutritional facilities is mostly due to the difference in economic status within developing countries.

Westeneng (2008) related the complicated relationship between maternal well-being and poverty by working on Indonesian Family Life Survey. The study argues that infant mortality has always been the center of attention for researchers whereas miscarriages and stillbirths have

always been neglected. Westeneng included miscarriages and stillbirths in her paper and analyzed how people at rural level cope with maternal health shocks. The research states that maternal mortality indicates loss of human capital and ill health is costly not only at household level but also at community level. Poverty raises the vulnerability whether it is income poverty or educational poverty or bad living standard and lack of better quality health institutes.

Amin, *et al.* (2010) investigated that household economic status, as indicated by wealth index; acts as the most important determinant in affecting healthcare behaviour. Mothers belonging to well-off house-holds were significantly more inclined to utilize modern trained antenatal care, institutional delivery, and postnatal care than those belonging to poor economic status. They suggested that formal education and improved wealth status can have a reinforcing impact on the maternal healthcare utilization.

Fawole and Adeoye (2015) examined the impact of household women's position on maternal care utilization in Nigeria. They investigated that women empowerment and control over financial resources contributes significantly in utilization of maternal healthcare services. Their study analyzed that working women were more inclined towards their own health care as they would be more aware of the healthcare benefits than those who do not work. Women who did not accept physical violence against themselves were also more likely to receive antenatal and delivery care. Among other determinants, education status of women also acts as an important factor in seeking medical help for themselves.

Coming towards Pakistan, Midhet, Becker and Berendes (1998) investigated the risk factors linked with maternal mortality in sixteen rural districts of Baluchistan and NWFP. Their findings suggest that distance to hospitals and the unavailability of prenatal care act as important reasons of maternal mortality. Also, women who had previously suffered from pregnancy losses were more cautious in utilizing MHC services. Moreover, the staffing patterns of peripheral health facility in the district and accessibility of essential obstetric care act as significant determinants of maternal mortality. Nisar and White (2003) present the socio-economic factors that influence the utilization of

antenatal decision among the reproductive age women in Karachi. The analysis showed that the higher income group of women was twice likely to take antenatal care than lower income group. Since the sample had only 25% literate women therefore education didn't show significant association with receiving antenatal care. Overall the knowledge regarding antenatal care and nutritional needs was greater among women who utilized antenatal care compared to those who did not.

Haq and Arshad (2007) study the impact of poverty status in hindering the MHC services in regions and provinces in Pakistan. Prenatal Care, institutional delivery, postnatal care and utilization of Family Planning Services (FPS) are used as a proxy to assess the utilization of MHC services. Home birth dominates over institutional delivery especially in rural areas and among lower economic groups. Women of high economic background utilize the private facilities whereas majority of middle class women avails public hospitals or clinics. Postnatal care is given less importance across regions and provinces in Pakistan. Ali, Bhatti and Kuroiwa (2008) examined the determinants constraining women's access to emergency obstetric services. Their analysis showed that poor hospital infrastructure, high staff absenteeism and geographical obstacles like distance and time to reach the facility cause many maternal deaths. Cultural factors such as female doctors should examine women; delayed access and unavailable human capital also endanger the life of mothers.

The use of antenatal care (ANC), post-natal care (PNC) and family planning can reduce maternal mortality. The findings suggest that rural women are responsive towards policies that eradicate the financial and physical barriers to accessing MHC services. Transportation barriers act as the main hurdle in use of ANC. The household wealth, mother's education and mass media exposure play a significant role in utilizing PNC services. Husband's education and approval of family planning were the most important drivers for the utilization of family planning services [Agha and Carton (2011)].

Mahmood and Bashir (2012) investigated the equity among the utilization and availability of health facilities among the married women. Wealth and other socioeconomic factors act as main determinants caus-ing health care differential especially in access to private and public

health services. Their results show improved inequality in access of MHC services. Educational level of women showed monotonic relation-ship with institutional delivery and prenatal care. Women's educational attainment has a strong impact in attaining MHC services. Overall, their results enhance the previous evidence that women who are least educated, poor and residing in rural areas encounter bigger constraints in accessing prenatal and delivery services from skilled health personal, which contributes to higher rates of maternal mortality and morbidity.

The state of health in Pakistan reveals that Pakistan currently lags behind in immunization coverage, contraceptive use and infant and child mortality rates. The rural poor are at a greater disadvantage when it comes to primary and tertiary health services and are not benefited much from public health services. Private health facilities and their provision have improved enormously due to the poor and diminished role of public health services [Afzal and Yusuf (2013)].

After reviewing the literature, the study reaches at consensus that a fairly good number of studies deal with health but studies particularly focusing on maternal (both prenatal and postnatal) healthcare in Pakistan are scarce. Of there, a few studies are more inclined toward medical literature but very few capture the socio-economic determinants along with community and medical history of women. The survey of literature also identifies that there is a need of research on exploration of a composite variable that can capture the maternal health. Only visiting the healthcare may not capture the healthcare behaviour, thus the present study is an attempt to fill this gap. Further, a handful of studies used survey data for a smaller region of the country, which is not helpful for generalization of results for a national level policy. Some studies, which exploit Pakistan Demographics Health Survey (PDHS) 2013-14 in exploring this issue but the present study distinguishes itself from earlier studies and contributes in literature principally in two ways: (1) The inclusion of explanatory variable which is not used literature in Pakistan, for instance, medical history (previous pregnancy losses) and distance to medical facility; and (2) the unique comprehensive dependent variable which is constructed through inclusion of blood test during pregnancy, received tetanus injection, urine tests and intake of iron tablets. Thus this variable gives more in-depth analysis of maternal healthcare behaviour.

3. DATA

The study exploits nationwide survey, (PDHS) 2012-13. PDHS is conducted by National Institute of Population Studies (NIPS) and executed through Pakistan Planning and Development Division (Islamabad). United States Agency for International Development (USAID) provided the financial assistance and technical assistance is provided by ICF international Calverton, Maryland USA.

PDHS provides information about marriage, fertility preferences, and maternal healthcare utilization. Moreover, the data is collected from urban as well as rural areas from all provinces of Pakistan, making it suitable for across country analysis. Furthermore, there is a scarcity of maternal care data sets and information, thus this survey is very useful for research in health care research studies.

Sample design in PDHS is based on 1998 census sampling frame. The survey excluded Federally Administrative Tribal Areas, Azad Jammu & Kashmir and restricted military and protected areas. Two areas of Baluchistan province (Punjgur and Dera Bugti) were dropped because of their deteriorating law and order situations. Overall, 24 areas (mostly in Baluchistan) were replaced, mainly because of their adverse law and order situation. The questionnaire used in PDHS provides extensive information at household levels as well as individual levels.

i. Measurement of Healthcare Behaviour

To study the maternal health seeking behaviour and its determinants, the dependent variables include pre- and post-natal care during pregnancy:
1. Prenatal Healthcare
2. Postnatal Healthcare

ii. Prenatal care

Prenatal care is defined as the regular preventive checkup from a health professional throughout the period of pregnancy to avoid any unwanted health problems. The Prenatal health care behaviour is measured through;

- Number of antenatal visits during pregnancy
- MHB index that allows us to analyze the pattern of relationships of several categorical dependent variables to health seeking behaviour.

MHB has been generated combining four binary variables including;

a) Blood test during pregnancy (Yes/No),
b) Number of Tetanus injections (Yes/No),
c) Urine tests (Yes/No) and
d) Iron tablets intake (Yes/No).

Both of these prenatal variables are sequential in nature. Number of antenatal visits is in binary form and it includes 7193 total women who responded to this question. Then among the total sample 5329 women responded to have had antenatal visits during pregnancy and were questioned regarding the nature of test received during those visits. 18 percent women among 5329 did not take any test during those antenatal visits during pregnancy.

iii. Postnatal Care

Postnatal care is defined as the health checkup of mother after 6 week period following delivery. The statistics for maternal healthcare shows that at least half percent of the women population utilized postnatal care after delivering their child. Unlike prenatal care, the function of postnatal care as a strong pillar of safe motherhood is comparatively unexploited in literature. Recent studies of Agha and Carton (2011) and Dar (2013) have used postnatal care from trained service providers as a component of MHC in Pakistan.

iv. Description of Independent Variables

The independent variables are divided into three categories: (a) individual; (b) household; and (c) community characteristics. Mother's individual characteristics, household characteristics, and community characteristics are regressed separately for pre and postnatal care. The detailed description of independent variables is given in Table 1.

Table 1. Description of Variables

Explanatory Variable	Description
Individual Characteristics	Age: Mother's age in years from 15-49 years
	Mother Education: Number of years of education 0-16. This variable is used as a proxy for awareness towards own healthcare and also for the affordability of services.
	Previous Pregnancy Losses: PPL shows if a woman has ever had a pregnancy loss. (Yes/No)
	Knowledge about pregnancy complication has been taken for postnatal care only (Yes/No). This variable is used as a proxy for awareness towards any complications
	Husband's Education: Number of years of education 0-16. Spousal educational attainment is also used as a proxy for awareness.
Household Characteristics	Wealth Index: Wealth index is used as the proxy for household welfare and affordability of the maternal care.
	Number of living children is used as a proxy for experience and parity level
	Distance to Health Facility measures the feasibility & ease in seeking medical help and is used as a proxy for accessibility of medical help
Community Characteristics	Region: dummy variable for urban/rural status, =1 for rural & =0 for urban. This variable is also used as a proxy for accessibility of medical facility

The rate of antenatal and postnatal care plays a fundamental function for the mother's health and outcome of pregnancy. Table 2 demonstrates that about 26 percent of Pakistani women did not visit medical facilities for antenatal care during their latest pregnancy, 19 percent did not receive any of the tests in the MHB index and about fifty five percent utilized postnatal care.

The statistics show that average age of women who availed pre and postnatal care is 32 years and the average education level of women is approximately 4 years of education which is not sufficient for proper awareness towards own healthcare. 33 percent of women reported to have the history of pregnancy losses and 40 percent of women population is aware of the pregnancy related complications during pregnancy. Spousal education level indicates an average of 6 years of schooling which is considerably low for information and knowledge regarding benefits of healthcare utilization. Around 38 percent of mothers belong to poor economic status and 19 percent belong to middle class showing high disparity in healthcare among different economic groups. The

average number of living children in household is about 3. Among the region, 53 percent of women belong to rural areas and 43 percent have the problem in utilization healthcare due to large distances to healthcare facilities.

Table 2. Summary Statistics

	Mean	S.D
Prenatal Care		
1. No. of Antenatal visits	0.741	0.438
2. MHB index	0.819	0.384
Postnatal Care		
1. Women health checked after delivery	0.552	0.497
Individual Characteristics		
1. Age	29.58	8.569
2. Women Education	3.823	3.903
3. Previous Pregnancy loss*	0.326	0.472
4. Knowledge about Pregnancy Complications*	0.405	0.498
5. Husband Education	6.645	5.426
6. Husband's Skilled Employment	0.541	0.498
Household Characteristics		
1. Wealth Index*		
i. Lowest		
ii. Second	0.191	0.329
iii. Middle	0.192	0.393
iv. Fourth	0.184	0.395
v. Highest	0.238	0.426
2. No. of Children	3.336	2.421
3. Distance to Health Facility*	0.431	0.490
Community Characteristics		
1. Region*		
i. Urban		
ii. Rural	0.535	0.498
N=7193		

Note: *Categorical variables.

4. METHODOLOGY

The study has its theoretical foundation on three popular models extensively used in healthcare behaviour literature. Moore (1969) emphasizes that individual, community and environmental variables explain healthcare behaviour. Two other models presented by Anderson (1968, 1995) further extend the earlier models by incorporating three major factors including: (1) predisposing factors (socio-cultural charact-

eristics of individuals), (2) enabling factors which include family and community characteristics and finally (3) need factors (genetic aspects and psychological factors). Whilst the theoretical foundation is based on these models we have tried to include maximum number of variables available in PDHS. Now we discuss the empirical specification of the model.

This study uses Probit regression model for all estimated equations on cross-sectional data of PDHS 2012-13 data. Probit models are used extensively in social science literature. The models are also very popular in health sciences while estimating the discrete choices. Many studies in literature like Scott, *et al.* (1996) for Australian data set, Yip, *et al.* (1998) for China, Gertler and Van der Gaag (1990) and Mwabu, *et al.* (1993) used these models with different specifications to explore the health care behaviour. Some other studies provide the comparison of different econometric methods but provide a strong evidence in favour of probit or logit model when it comes to demand for different healthcare choices, see for instance, Dow (1995), Kenkel (1990) and Bolduc, *et al.* (1996). Based on this strong evidence from health science literature, this study opts the similar econometric method to explore this issue. The main aim is to recognize the socioeconomic determinants of maternal healthcare behaviour amongst married women in Pakistan; we start with a simple model:

$$MHB_i = \beta_i + \Sigma I_i + \Sigma H_i + \Sigma C_i + \mathcal{E}_i \qquad \text{... (1)}$$

where, MHB_i is maternal health seeking behaviour of a woman, I_i represents Individual characteristics of a woman, H_i is Household characteristics and C_i represents community level characteristics.

1. $Pr(NVD_i=1) = \beta_0 + \beta_1 Age + \beta_2 MEduc + \beta_3 PPL + \beta_4 HEduc + \beta_5 WI + \beta_6 HC + \beta_7 DHF + \beta_8 Region + \mathcal{E}_0$

2. $Pr(MHB_i=1) = \beta_0 + \beta_1 Age + \beta_2 MEduc + \beta_3 PPL + \beta_4 HEduc + \beta_5 WI + \beta_6 HC + \beta_7 DHF + \beta_8 Region + \mathcal{E}_0$

3. $Pr(PNC_i=1) = \beta_0 + \beta_1 Age + \beta_2 MEduc + \beta_3 PPL + \beta_4 HEduc + \beta_5 KPC + \beta_6 WI + \beta_7 HC + \beta_8 DHF + \beta_9 Region + \mathcal{E}_0$

where, *NVD* is Number of visits to the doctor, *MHB* is Maternal Health Behaviour index, *PNC* is Postnatal care, *MEduc* is Mother's Education, *PPL* is Previous Pregnancy losses, *HEduc* is Husband's Education, *KPC* is knowledge about pregnancy complications, *WI* is Wealth Index, *HC* is Number of Household children, *DHF* is Distance to Health Facility and region represent urban/rural dummy. The error term is represented by ε_0.

The independent variables are divided into three categories: (a) individual; (b) household; and (c) community characteristics according to the awareness level among women, accessibility of health service and the affordability of the services. All the variables are regressed separately on three different binary dependent variables.

5. RESULTS AND DISCUSSION

In this section we discuss the regression results of the equations predicting the MHB. Using the above empirical specification, the impact of socioeconomic determinants on prenatal and postnatal outcomes is presented in Table 3 along with the coefficients and standard errors for each estimate. The study presents and subsequently discusses the results for each outcome. All the variables used in the study have signs consistent with the existing literature for MHB of women in Pakistan.

It is estimated that over half a million women die of pregnancy-related reasons every year, more than one each minute. According to a global study 34% of child deaths occur in South Asia because of lack of facilities at childbirth [Black and Bryce (2003)]. The situation in Pakistan is even more alarming. According to Siddiqi, *et al.* (2004) approximately 400,000 infant and 16,500 maternal deaths occur annually in Pakistan. One in 38 Pakistani women dies from pregnancy related causes as compared to 1 in 230 women in Sri Lanka. Almost one half of women are anemic throughout their pregnancies. The maternal mortality ratio in rural Baluchistan is 785 maternal deaths to 100,000 live births, compared to the national average of 340 per 100,000[2]. Lack of proper policy focusing towards maternal health is discussed in detail [Rizvi and Nishtar (2008)].

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[2] NIPS, 2001

Table 3. Regression Results for MHC Behaviour of Women

Ind. Variable \ Dep. Variable	Prenatal care		Postnatal care
	No. of Antenatal visits	MHB Index	Postnatal Check-up
Individual Characteristics			
1. Age	-0.004	-0.006	-0.022*
	(0.003)	(0.004)	(0.006)
2. Women Education	0.077***	0.062**	0.033***
	(0.006)	(0.006)	(0.004)
3. Previous Pregnancy losses	0.128***	0.033	0.151***
	(0.038)	(0.047)	(0.034)
4. Knowledge about Pregnancy complications	-	-	0.538***
			(0.033)
5. Husband Education	0.008**	0.021***	0.006*
	(0.004)	(0.005)	(0.007)
6. No. of children	-0.066***	-0.071***	-0.067***
	(0.011)	(0.014)	(0.011)
7. Husband's Skilled Employment	0.105**	0.059	0.043
	(0.038)	(0.047)	(0.044)
Household Characteristics			
1. Wealth Index*			
i. Lowest (ref.)	-	-	-
ii. Second	0.162**	0.245***	0.029
	(0.048)	(0.065)	(0.048)
iii. Middle	0.427***	0.352***	0.182***
	(0.054)	(0.069)	(0.048)
iv. Fourth	0.676***	0.473***	0.421***
	(0.065)	(0.078)	(0.053)
v. Highest	1.012***	0.783***	0.799***
	(0.089)	(0.099)	(0.071)
2. Distance to Health Facility	-0.248***	-0.204***	-0.211***
	(0.037)	(0.046)	(0.038)
Community Characteristics			
1. Region*			
i. Urban	-	-	-
ii. Rural	-0.053	-0.031	-0.154***
	(0.043)	(0.081)	(0.038)
Constant	0.0411***	0.334**	-0.519***
	(0.107)	(0.135)	(0.096)
No. of Observations	7193	5329	7193
R2/ Pseudo R2	0.196	0.156	0.138

Notes: *= $p < 0.10$, ** = $p < 0.05$, *** = $p < 0.01$. Standard errors are given in parenthesis below the coefficients. Pseudo R2 is reported for prenatal and postnatal care.

The empirical investigation found age of the mother to be negatively associated with healthcare behaviour. Age of the mother indicates that older women tend to put less emphasis in utilizing maternal care. Young mothers are more likely to receive antenatal care from a skilled health provider than older mothers [PDHS report (2013)]. Although insignificant for prenatal, age is statistically significant for the postnatal healthcare behaviour. Age of the mother in general influences use of pre- and post-natal services among the respondents. This result is consistent with existing literature on the relationship between age and MHB. Weller, *et al.* (1987) had shown that age alone may not affect the behaviour but combined with the desirability and planning of pregnancies are associated with irregular utilization. Bhatia and Cleland (1995) had indicated that age is linked with low MHC utilization, particularly in women above twenties.

Mother's Education is used as a proxy for awareness and affordability of healthcare facilities and it shows a significant impact on the utilization of both pre and postnatal services. Educated women, especially with secondary and above level, indicate a much profound behaviour towards maternal health. As shown in Table 4, women with one to five years of schooling and above are 3 percent more likely to receive antenatal and postnatal care compared to those without any schooling. This analysis is consistent with the previous researches which indicated that the coefficients for different categories of women's educational attainment show that women with middle and higher education have a greater probability of visiting a health care facility for antenatal care as compare to illiterate women [see, Elo (1992)].

One explanation of higher educational impact can be that higher educated women are more likely to seek higher quality services and have a greater ability to use health care inputs to produce better health. This is supported by Streatfield, *et al.* (1990), who showed that higher educated women are more likely to be aware of healthcare benefits and therefore, are more likely to use preventive health care services.

The estimates show that women with terminated pregnancies or pregnancy losses tend to be more cautions and have a greater likelihood of utilizing MHC services. In Table 4, the coefficient for pregnancy losses shows that women who have faced previous fetal loss are 3 percent

more likely to utilize prenatal care and 5 percent more likely to receive postnatal healthcare. This finding is consistent with the existing literature. Mahmood and Bashir (2012) had indicated that women with a previous fetal loss or still birth have higher likelihood of receiving antenatal care, tetanus inoculations and postnatal care as compared to women with no maternal history.

Table 4. Average Marginal Effects for Prenatal and Postnatal Care

Dep. Variable / Ind. Variable	No. of Antenatal Visits	MHB Index	Postnatal Check-up
Individual Characteristics			
1. Age	-0.001	-0.002	-0.002*
	(0.001)	(0.001)	(0.001)
2. Women Education	0.029***	0.023***	0.021***
	(0.002)	(0.004)	(0.011)
3. Previous Pregnancy losses	0.033***	0.007	0.051***
	(0.009)	(0.010)	(0.010)
4. Knowledge about Pregnancy Complications	-	-	0.181***
			(0.011)
5. Husband Education	0.002**	0.047***	0.002*
	(0.001)	(0.015)	(0.001)
6. No. of Children	- 0.022***	-0.021***	-0.023***
	(0.002)	(0.003)	(0.003)
7. Husband's Skilled Employment	0.027**	0.013	0.014
	(0.009)	(0.012)	(0.012)
Household characteristics			
1. Wealth Index*			
vi. Lowest (ref.)	-	-	-
vii. Second	0.052**	0.068***	0.009
	(0.015)	(0.018)	(0.017)
viii. Middle	0.129***	0.094***	00.064***
	(0.017)	(0.019)	(0.019)
ix. Fourth	0.191***	0.121***	0.151***
	(0.018)	(0.020)	(0.021)
x. Highest	0.251***	0.176***	0.275***
	(0.020)	(0.022)	(0.024)
Community Characteristics			
1. Region*			
iii. Urban			
iv. Rural	-0.014	-0.008	-0.054***
	(0.011)	(0.011)	(0.013)
2. Distance to Health Facility	-0.064***	-0.045***	-0.070***
	(0.019)	(0.010)	(0.012)

Husband's level of education is considered to be an indication of economic welfare of the household as it interprets into higher level of earnings. Also, husband education level depicts the health knowledge and awareness towards the medical care utilization. Husband's educational level shows statistically significant coefficients for all the dependent variables. The average marginal effect shows that the probability of significant MHB increases by about 4.7 percent with a unit rise in spousal education. Spousal skilled employment level shows positive and significant impact on receiving antenatal care, as skilled employment can result into higher earnings and hence more likelihood of receiving maternal care.

Knowledge about pregnancy complication variable is used in case of postnatal care only. The justification behind this variable is that women who have been told about pregnancy complication will be more cautious towards their health and the infant's health. As shown by Table 4, the coefficient for pregnancy complication knowledge shows positive and significant probability of receiving postnatal care. The likelihood of receiving postnatal care increases by 18 percent with one unit increase in the pregnancy complication knowledge.

Household's income and property can have a positive impact on MHB [see, Celik and Hotchkiss (1994)]. But PDHS does not include the questions of household income. However, it provides wealth index for each household. The wealth index coefficient shows positive and significant results for maternal health seeking behaviour, depicting that women who belong to wealthier households tend to seek higher maternal care than the ones belonging to less affluent households, ceteris paribus. Likelihood of receiving prenatal care for women belonging to rich household is approximately 25 percent higher compared to women belonging to poor households and a 27 percent higher probability of receiving postnatal care compared to poor women. This result is highly consistent with the existing literature [see, Gwatkin, *et al.* (2007); Mehmood and Bashir (2012)].

Number of living children in the household is used as a proxy for parity level of women and experience. The estimates for number of household children for all the outcomes are negative and statistically significant, indicating that women who have higher number of living

children tend to put less attention to healthcare. Table 4 shows a 2 percent fall in receiving pre and postnatal care if there is a unit rise in number of living children. This result is highly in accord with previous studies that suggest women who belong to large households are subject to less empowerment and decision making as compare to women belonging to households with fewer members [see, Mumtaz and Salway (2007); Dar (2012)].

The variable of distance to health service and region is used as a proxy for accessibility of service to the women. As shown in existing research (see, Banda, 2013) long distance to medical healthcare facilities contributes to low utilization of such facilities. With a one unit increase in distance to facility, the likelihood of receiving antenatal and postnatal care falls by 6.4 percent and 7 percent respectively. The urban/rural status shows significant result for receiving postnatal care. This indicates that the rural women are 5 percent less likely to seek maternal health care compared to urban women due to easy availability of institutional facilities in urban areas. The availability of lady health worker in nearby regions provides ease of utilizing the services.

6. CONCLUSION

Regardless of the progress made in recent decades in improving maternal health outcomes in Pakistan, the situation of maternal health and maternal mortality remain unacceptably high and alarming. The use of maternal health services is widely accepted as a crucial indicator of good health of both mother and child. This thesis has investigated the impact of socioeconomic indicators on MHB of women in order to improvise the available information regarding maternal health to the policy makers and administrations of welfare programs.

The socioeconomic indicators that are found to be mainly significant are mother's education, knowledge about pregnancy complications, parity level, distance to facility and wealth index. The regression results confirm the significance of higher schooling received by women. Higher education and higher socioeconomic status improves the awareness and knowledge about the health facilities and importance of healthcare utilization and is associated with better prenatal and postnatal

outcomes [Caralon and Frankowaska (2010)]. On the other hand, husband's education indicates positive result and shows that only primary education is not sufficient to understand the vital role of modern medicine and improved health services.

The empirical investigation shows that younger women are more cautious and seek higher maternal care services. Age is also associated with experience; hence advanced aged women tend to put less emphasis on care by health professionals as they try to find easy remedies for their own healthcare sitting at home. Similarly, mothers who have faced pregnancy losses are more cautious and attach more importance to their healthcare. Therefore, higher the number of pregnancy losses, higher will be the health seeking behaviour.

Another important finding is that women's health knowledge has emerged to be a strong influence on maternal health seeking behaviour of women. The variable of pregnancy complication knowledge shows that women with the information of health outcomes put more importance on healthcare after delivery as compare to those who are not informed about such complications.

Among the household characteristics, household's wealth index appears as one of the most significant determinants of MHB. While this might not be an unusual finding, it indicates alarming effect of poverty over MHB of women. Women belonging to less affluent households are associated with low prenatal and postnatal care compared to those who belong to better economic status. Poor population of Pakistan faces worse healthcare conditions compared to the upper class population.

With respect to parity, women with higher number of children showed negative and statistically significant impact on health seeking behaviour. Higher number of living children represents the experience of women with respect to childbirth; hence it is associated with low utilization of maternal care utilization. Statistically significant and negative impact of distance to the health facility emphasizes the need of improvised and easily accessible but inexpensive public health programs.

Healthcare policy makers repeatedly argue over the regional disparities in deliverance of healthcare facilities. Regarding this disparity issue the effects of urban/rural status are of particular interest. Living in

rural areas was found to have a negative and statistically significant effect on the probability of using postnatal care, but we found no significant urban/rural difference with respect to prenatal care utilization.

The study arrives at important policy implications. First, there is a need to educate women about health care utilization and its importance. For this, government can start different programmes that visit households and educate married women about maternal health and its consequences. Second, our results show that wealth is an important determinant in maternal healthcare and economic reasons are the biggest hurdles in determining the healthcare behaviour. A careful, well-designed and well-targeted policy is required in form of providing facility free of cost or on subsidized rates. Finally, creating awareness towards family planning should be the priority agenda of government.

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