Impacts of Women's Education on Maternal Health in Bangladesh

By

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Abstract

The study focuses on the educational factors that influence the health of mothers. Improving women's health is a key objective for almost all the developing countries. A country's socio-economic status depends on its inhabitants' health, where mother's health is a must for a healthy nation. Recently, there has been an improvement in reducing the maternal and infant mortality rate in Bangladesh. However, the country is still struggling with the rate of health risks faced by adolescent mothers. Socioeconomic indicators such as educational status, knowledge about healthy food and health services are impacting the health risks of adolescent mothers. In my thesis, I seek to examine that how educational status itself as a social indicator has an impact on the health of the mothers. The estimation of the relation between educational status and mother's health was taken using two different estimation models: Probit Analysis and OLS Regression. I found a significant relationship between safe child birth and the educational background of the participant and her husband. Increase in educational level has a positive impact in increasing the rate of safe child birth. I found no correlation between a vast number of factors related to maternal health and education. Based on these findings, as an important step to improve maternal health ensuring the overall educational status of the nation is the most feasible measure for the government. However, for the long run, measures such as introducing health facilities and improved health centers might help in reducing the maternal health risks of the mothers.

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Abbreviations

- **LMRF:** Lion Mukhlesur Rahman Foundation
- **OLS:** Ordinary Least Squares
- **ARIMA:** Auto-Regressive Integrated Moving Average
- **NGOAB:** The NGO Affairs Bureau
- **ZCF:** Zero Club Foot
- **CC:** Cure Cleft
- **MMR:** Maternal Mortality Ratio
- **AoM:** Age of mother
- **edu1- edu5:** Education level of those women from primary level to higher studies.
- **hedu1-hedu5:** Husbands education level from primary level to higher studies
- **fedu1-fedu5:** Parents (father) education level of those women from primary level to higher studies
- **medu1-medu5:** Parents (mother) education level of those women from primary level to higher studies
- **hagri:** Husband doing agricultural work
- **hservice:** Husband doing service related work
- **hbusiness:** Husband doing business.
- **hmigrant:** Husband are migrant workers
- **son_only:** The family has only one son.
- **dau_only:** The family has only one daughter.
- **FMEx:** family monthly expenditure
- **HExp:** Health expenditure
- **FExp:** Food expenditure
- **FMIn:** Family monthly income
- **AP:** age during Pregnancy
- **PrgC**: Pregnancy complicacy

Key Words:

- Health Risk
- Educational Status
- Income Status
- Other Family Members' Educational Status
- Adolescent Mother
- Age of Marriage
- Occupation
- Health Care & Vitamin Intake

Chapter 1

Introduction

Bangladesh a country founded 48 years ago has been facing a lot of struggles to reach its goal for economic stability since its inception. Despite its improvement in sectors like politics, poverty, agriculture, industries, etc. the country is still struggling with its fight against some major issues like education, population growth, health and inequality. According to a report by BTI, the country is growing with a steady rate of 6% on average for the last ten years. They also reported that the country was successful in reducing the poverty gap to 6.5 %, but still struggling with the rapid increase in the population (Bertelsmann, 2018). At present the country's population is 168.07 million without the counting of the intake of 1 million Rohingya refugees, who took shelter in Bangladeshi camps after facing ruthless attack form the Myanmar armies (World Report, 2019). Dealing with this rapid growth in population (shown in Figure.1) and to provide basic facilities of survival to its country people, while it is difficult to maintain a high level of development in the educational sector in the long run. The country's natural resources and land for agriculture are at huge risk due to this trend of increased population. Akhter (2012) mentions in her article that
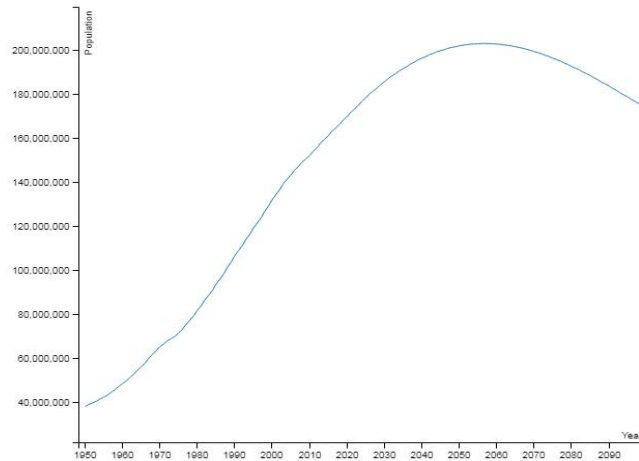
Figure 1: Bangladesh Population Growth.

Source: World Population Prospects, 2017.

though the country improved a lot in introducing primary and secondary education, 50% of the population aged above 15 years are unable to read and write at all. She added that therefore *"investigation in human capital is important"* and to increase productivity in workforce, investing on women's education is important as it increases their knowledge about nutrition for her and the family (Akhter, 2012). This will in the long run develop the country's economy and at the same time will be a medium to save the country and move it above the poverty line making its population as a source of development.

1.1. Motivation of the Study:

The motivation of the study is mostly the educational factors that have often been overlooked as influencing factors of maternal health; instead mother's strength and wellbeing have always been the major focus for such study. Bangladesh is often lauded as a role model in achieving the Millennium Development Goals for its remarkable progress in reducing child and maternal mortality (IFPRI, 2015). However, a UNICEF report shows that in Bangladesh 66% of all girls are married before the age of 18 and one third of these marriages occur before the age of 15. Also, owing to the high prevalence of child marriage, one third of adolescents aged between 15 and 19 bear children at such a tender age (UNICEF, 2017).

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Despite an overall improvement in the health risks faced by mothers of this struggling developing country, health and nutritional risks faced by adolescent mothers remains a major challenge for policy makers. Often, childbearing during adolescence is perceived as a cause of poverty rather than a consequence (Kamal, 2012), further highlighting the notoriety of its cyclical impacts. Adequate focus is not directed towards the health and educational status of the adolescent mothers. Studies in other parts of the world show an important role of education on maternal health risk.

Despite substantial implications of educational status as well as mother's knowledge of nutritional necessities or health and nutritional risks of adolescent mothers, studies evaluating the association and its significance are scarce, especially in the context of Bangladesh. This research aims to draw results on the impact of educational status on maternal health risks in Bangladesh.

1.2. Objectives of the Study:

The paper seeks to focus on how educational status itself, as a social indicator has an impact on the health of the mothers. Taking this lesson into account the paper aims to find out whether the educational status of a mother influences her health in Bangladesh.

The main aim of this study would be suggesting noteworthy policy guidelines; as it is essential to address the cyclical nature of educational status to formulate long term policies that might reduce health and nutritional risks permanently. This study will report on the following objectives:

- Look at the relationship between a mother's education and her family educational background with improvements in their nutritional attainment.
- Utilize the study results to recommend policies for improving the country's educational structure, that could also be applied to other developing countries sharing the same features as Bangladesh.

- Look at the impact of women's educational status on maternal health, which in the long run helps to improve their family's health conditions.

1.3. Explanation of terms:

1.3.1. Pregnancy Complicacy:

Pregnancy complicacy is used for participants who faced complications like feeling sick, vomiting, blood flow, fainting, bad appetite, body pain, severe headache, sleep deprivation, anxiety, depression, stress, lack of food during pregnancy.

1.3.2. Safe Child Birth:

Here, safe child birth describes giving birth to a healthy child along with the mother facing no complicacy with the help of trained delivery personnel. It also counts the post-delivery safety and health for both mother and child.

1.3.3. Legally Married:

This term in this research is used for the girls married after or at the age 18, which is the legal age of marriage for women in Bangladesh.

1.3.4. Health Expenditure:

This term describes the overall amount spent on family health, which might include going to a doctor, buying medicine and vitamin intake.

1.3.5. Son only or Daughter only family:

This term is used in this thesis for the families, who has only one child, either daughter or son.

1.3.6. Primary Level Education:

In the context of Bangladesh, primary level of education is basically completing Grade 1-5 within the age of 6-10 years. This age group is officially considered for the primary education, though the age rule is not strict for anyone.

1.3.7. Secondary Level Education:

Again, secondary level of education is completing Grade 6-10 within the age of 11-15 years. This age group can also vary in different situations.

1.3.8. Higher Secondary Level Education:

This higher secondary level of education is basically completing Grade 11 and 12 within the age of 16-18 years. Again, this age rule is not strict for any student.

1.3.9. Healthy_Food_Score:

The value of this variable is converted into a single variable by applying factor analysis, as running regression for all the variables for measuring the healthy diet will be time consuming and would not give a reliable results. By doing factor analysis, I converted the score of proper vitamin intake, milk intake, protein intake and fruit intake in one variable named Healthy Food Score.

1.4. Study Overview:

I am going to present an overview of the literature related to this topic and also present a country overview on this context in the coming chapters (Chapter 2), also I am going to describe the research methodology in detail so that the readers get a clear overview on how these data were collected (Chapter 3), present the strategy used for this analysis and discuss the results of the

empirical analysis (Chapter 4), discuss the association between the variables and describe the association in details (Chapter 5), discuss few possible policy recommendations (Chapter 6), and give concluding remarks along with discussing the limitations of this study (Chapter 7).

Chapter 2

Literature Review

2.1. Background on Education and its Correlation with Maternal Health:

There are several researches on the importance of education for mothers. Mostly it is considered as one of the most powerful media for improving a women's overall state. In modern countries women's education is taken as the fastest strategy to empower their lives and the overall society. It works as a cycle for these women, as they gain knowledge and confidence through education, and as a result their education provides them with the necessary knowledge about being healthy, gaining nutrition and education in the long run. It builds her up to take her own decisions and helps her to take decisions regarding her family's welfare. Moreover, different educational levels logically define the educational status of a person. This educational status can be defined from having zero educational background to higher educational background, which also describes the primary secondary and tertiary level of education. Educational status of a mother is something that describes all these levels of education before and after giving birth to a child or being a mother. This educational status is very important for any person and especially mothers, as this learning helps them to learn more about health, nutrition along with all other knowledge. The more educated the nation is, the faster they head towards success and development in terms of health, wealth and everything. Studies show that education influences the overall health of a mother. Mason and Lee (2005) mentioned in their article *"Mother's Education, Learning-by-Doing, and Child Health Care in Rural India"* that increasing educational prospects improves the health of children and the mothers. According to them, educated mothers are more likely to seek post and pre-natal care, and immunization services for both male and female children. Also, lack of education limits the mother's knowledge to learn from prenatal care and media campaigns. Uneducated mothers are

less likely to immunize themselves and their children, especially in case of girls, which technically affects their overall health and suffers as a whole in the long run (Mason & Lee, 2005). However, socioeconomic status is generally perceived to be highly intertwined with access to healthcare and nutrition and very few studies talk about the importance of family members educational and income status on mother's health. This section focuses on the issues that are essential for the analysis of this study, which are mainly related to the educational status of a mother, their knowledge about health, nutrition and their health situation.

2.2. Previous Researches on the Role of Education on Maternal Health:

According to a Chilean natural experiment conducted for the last 50 years by Koch et al. (2012), women's educational level has a huge role in decreasing maternal mortality rate. This study was conducted by renowned researchers around the globe from 1957-2007 with time series data of MMR collected from the National Institute of Statistics. They used control variables like educational years, fertility rate, birth order, income per capita, clean water, sanitary sewer and delivery by skilled attendants using autoregressive integrated moving average models (ARIMA), which can affect maternal mortality. They also added the health related maternal and educational policies applied in 1965, laws of 1989 implemented to ban abortion to see the impact of those on maternal mortality rate. Moreover, the death per 100,000 live births for maternal mortality decreased to 18.2 from 293.7, which showed a historic change in maternal health in Chile. Also, among all the factors the women's educational level was the most effective one to bring this change, which showed a decrease of 29.3 death per 100,000 live births for an increase in a year of maternal education. Koch et al. (2012) also found on this research that prohibiting abortion did not increase the maternal mortality rate. Whereas the study shows, Chile faced the highest mortality rate when they legalized the therapeutic abortion. Additionally, these data evidently showed that

not legalizing abortion did not increase the rate of mortality from abortion and decreased the death rate to -9.95 per 100,000 live birth within 1989 to 2007. The Chilean study also found that the decline in the maternal mortality rate also has an impact of skilled birth attendants. It showed that an additional 1% increase in deliveries done by skilled people with women's education decreased the mortality rate by -2.41 per 100,000 live births. They also added that increasing the level of educated mothers had the power of increasing the concern of taking early prenatal care, healthcare services, nutritional food and going to a skilled person for delivery. Koch et al. (2012) says that along with reducing the mortality rate, it also reduced the infant mortality rate in Chile. Over that, age of the mother on this Chilean study showed a significant effect on the maternal mortality rate, when the mother is aged older than thirty years during pregnancy. The death per 100,000 live births were thirty for an 1% increase in women getting pregnant with age more than 30 years. This natural experiment of Koch et al. (2012) presented Chile as a perfect model of healthy motherhood to represent to the world. Throughout the study they showed that education is the vital tool that helped the Chilean mothers to decrease maternal mortality rate as well as decreasing the trend of late motherhood and fertility, when the mothers are being more concerned about their maternal health without legalizing abortion. The authors successfully concluded that legalizing or illegalizing abortion did not have any significant effect on maternal mortality rate, whereas education of women had a lot to do in decreasing maternal mortality rate and increasing the quality of using maternal health services (Koch et al., 2012).

The above-mentioned Chilean experiment got high recognition for a deep investigation of the effect of policies implied before and after the interference. They also suggested these techniques to imply in different countries with different MDGs to reduce the overall maternal mortality rate. The positive part for making this experiment rich was its availability of consistent, large and

parallel time series data for 50 years. The Chilean rules and regulations made it possible to get the detailed reasons behind any maternal death that occurred within these years. This made the research more reliable in terms of the depth of finding the reasons for this increased MMR. The authors used piecewise regression analysis for this natural experiment, as it was kind of impossible to show any causal relationship among these time series data. This piecewise regression analysis was the best fit for this experiment, as the authors used separate segment and divided the independent variables with the interval of time with historical changes. This helped the independent variables in showing the diverse relationship among the variables staying in the same region. The huge timeseries data allowed the researchers to have in-built graphical illustrations, understand the trend of the variables after and before the policy interventions and allowed them to consider other corresponding variables like family planning, availability of health programs, knowledge about abortion and level of education. Also, after the interference in several time periods, the quantity of effect could be estimated along with controlling other variables at the same time due to the benefit of using multiple causal pathway modelling. Though the study method shows a very effective way to find the reasons of maternal mortality rate, this cannot be true for each country due to the lack of data. Especially the developing countries, which are suffering from the maternal mortality rate the most would not be able to conduct this kind of research due to lack of reliability and availability of this kind of data. Moreover, not all the countries have strict laws regarding the tracking of all these data related to the number of stillbirths, mortality rate, skilled people, age of the mother, health care opportunities, availability of health education, which makes it difficult for these countries to reach to a strong conclusion behind the reasons of MMR. Countries like Bangladesh would not have the policy to track the clinical registries, reasons behind the death, and legally surveying the relatives or the medical person to know the cause of death.

This is a huge lacking for any country to conduct this kind of research and reach reliable conclusions. Also, depending on the country's age, area, population density, environment and availability of basic needs it will give different results for different situations. The study could also have mentioned the indirect causes behind maternal mortality rate from the very beginning of the series instead of using this data from late 80's. The experiment also faces the problem of multi collinearity due to the multiple parallel time series. There was a high correlation with the independent variable and mortality rate and high correlation with the timing. As it was a long-term research, some of the variables varied with time which might have created biased results. However, the use of ARIMA models instead of OLS or others helped to rule out those causes that arose due to the change in historical backgrounds. Despite the lacking and undesirable possibilities, this kind of research could be implemented on other countries according to their data availability, surroundings and accessibility of all the information's related to maternal mortality to know the proper reason behind the mortality rate, which will help to implement some specific policies connected to the strategies outlined by MDGs to decrease the rate of maternal mortality.

Another study in Peru by Elo (1992) explored the same topic studying whether "formal education of women influences the use of maternal health-care services in Peru". The data was collected from the Peruvian Demographic and Health (DHS) for the year 1986 with a question-based survey on the last 5 years. The mentioned study focused on women with reproductive age and collected data on the use of contraceptives, preference of fertility, marriage rate, educational background of the respondent and her husband, work experience of respondent and her husband. The survey mainly focused on the information of the respondent's health care services, whether they took it or not during pregnancy or delivery, vaccine intake and treatment for the newborn child. As the

study focused on 17 different geographic regions in Peru, they used two staged cluster sampling method to keep the sample self-balanced. The target group for the survey was mainly the mothers, who gave birth at least 5 years before the survey and the number of surveys were done on 4999 women. They also focused on the ever-married mothers because the data of their husbands' work experience and education was important to get their economic status, as this matters a lot in terms of maternal health and taking care of them. Also, the data was collected for only the first born of the family, so that there is no repetition of data in the survey (Elo, 1992).

Elo (1992) created two dependent variables as a measure of up-to-date health care services, which are prenatal care and the delivery support. She took the binary values 1 for taking service and 0 for not, if the answers for the questions were yes or no respectively. The Peruvian study showed that mothers used prenatal care more than delivery assistance in terms of using proper health centers. This difference of taking health service was huge in the rural areas, where mother mostly preferred receiving prenatal care than delivery assistance. The author used the conceptual framework of Kroeger (1983) in her study to show the factors of utilization in three divisions based on developing countries. They described the three divisions in terms of factors like household size, age, sex, education in one group; features of diseases in another and features of health-care in the third group. They added that only education was the only dominant factors among all these to affect the utilization of health-care facilities. Moreover, the measurement of maternal education was divided into 4 different categories, as the educational level is not consistent in terms of sample size for all the level. Over that, the other explanatory variables were divided into categorical variables accordingly, as the data was different for rural areas. The author also used fixed effects model to capture the unmeasured cultural factors, which usually has an impact on the usage of

health services specially in developing countries. She also used the respondents' husband's educational background as a proxy variable, as this reflects husband attitude towards modern medical services and their decision to provide those services to their wife. Adding to that there are four more proxy variables used by the author in this study to measure the economic welfare of the family and its impact on the maternal health. Elo (1992) estimated logistic regression to check the comparative effects of the factors connected to maternal health. She used fixed effects model, which helped the study to test the capability of supervising the availability of health services. Also, the random sampling for clusters was a good decision for the test, as it would have been difficult for the research to select women with unique characteristics. The author excluded the participants with matching characteristics, while considering them as a dependent variable. In addition, the study suggested the government to take further initiatives, as there was a huge difference in the usage of health-care services depending on the places the respondents are living. Also, it suggested to pay more focus especially on the rural areas, where it is difficult for the people to reach the health facilities (Elo, 1992).

The study results ultimately gave importance to the education of mothers for utilizing the health-care facilities provided for them. Using fixed-effects model was a just use of it, as it helped the study to figure out the unobserved differences among the samples. As both the cross-sectional model and fixed effects model gave almost the same significant result for the importance of education for the use of delivery support and prenatal attention, it seems like a reliable and convincing use of the models for this study. Both the OLS regression and the fixed effects model give the similar estimate for the study. Elo (1992) also used the Hausman specification test to determine the differences between the co-efficient of both the models. This specification test helped the ordinary least square test to avoid the endogeneity problem of the dataset, as OLS

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regression cannot have any correlation between any independent variable and its error term. So, the Hausman specification test was important for avoiding endogeneity. Moreover, to avoid repetitive response the excluded variables that were mentioned at the very beginning also reduced the sample size, which has a higher possibility to affect the accuracy of the estimates of the explanatory variables. So, to avoid this problem the study could have used the respondents ID number to avoid repetition. This could have given a more convincing estimate without this kind of problem. As mentioned Elo (1992) that "the educational level of the Peruvian mother depends on birth cohort, place of residence and ethnic group native language", there could be a possibility that results are somehow biased due to the variation of region. The study does not mention that the sample size from all the regions were equal. As the level of education can be very different from one region to another, which is a very common case in developing countries, the response can be different for all those regions though being the same country. Some parts of a country are more inclined to education due to facilities and culture and some are not. There is a likelihood of getting biased result for a certain area and if the sample size from that certain area is larger, then the result will be inclined to those specific response. Also, the study did not mention response bias, which has a huge impact on any kind of study. The details of the survey environment are not explained, i.e. whether there was private space for each respondent to answer to these questions or not. The high possibility of facing response bias might have affected the result of the study to some extent. Respondents mostly tend to answer in a similar way, if they see others responding in a certain way. Also, lack of privacy sometimes forces the respondent to answer the true reason behind any problem. Thought this might not be common problem in a country like Peru, but it might be occurred in a huge number in developing countries especially in the South-east Asia, where culture and society have the higher authority over everything else. Social pressure and cultural context

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might not allow the respondent to answer and share their personal information in mostly rural areas. So, it is a huge issue for these kinds of countries to follow this type of study models to bring a broader change in the long run. Adding to that a country's overall condition and economic standard also plays a vital role on performing this kind of research. Among thousand other reasons, this can be one of them for the policy makers to reach to a conclusion and suggest a better policy for the improvement of the country and reduce the problem (Elo, 1992).

2.3. Women's Education in Bangladesh:

The education system of Bangladesh has been divided into 4 different sectors; primary, secondary, higher secondary and higher studies, which includes the undergrad and master's level education. According to a study of Bangladesh Bureau of Statistics from 2010-2015 the rate of enrollment in primary level education was higher for girls than boys. Also, the enrollment rate for girls increased by 9.2% as compared to that of boys at primary level. Whereas, the sad part for the country is the increase of enrollment is not consistent in terms of secondary education and the performance of girls are not improving in secondary education (Bangladesh Bureau of Statistics, 2017). In another article Haque (2018) points out some of the reasons behind the dropout of female students from the secondary level of education. He added that among these reasons poverty is the main one along with early marriage, distance from the school and poor organization of the education system (Haque, 2018). Girls coming from poor backgrounds are mostly kept at home to do the household chores after a certain age, which somehow is an effect of the cultural, social or religious views. Early marriage is another reason behind this rapid drop out of girls from school. Lack of education among the parents or low economic status force them to marry off their daughters at an early age, which hinders their education especially in the rural areas. Also, many rural areas in Bangladesh

are still facing the lack of proper educational institution. Though institution for primary education is available, the availability of institution for secondary schooling is not that much. So most of the time due to insecurity and to save transport cost most of the parents in the rural areas decide to drop out their daughters from the school (Haque, 2018). But the scenario is different for the upper middle-class people, as they tend to educate their girls to higher levels. Also, the city dwellers are more likely to educate their girls, as they have easier access to more facilities. Being a country where majority is leading a life below the poverty line, they are the majority who are deprived of education and other facilities, especially the women. This results in a larger unemployment rate among the women and affecting the country's economy and overall progress in the long run.

2.4. Women's Maternal Health in Bangladesh:

In terms of maternal health, Bangladesh made a notable development in achieving the millennium development goal 5 by 2010. The rate of maternal mortality decreased by average 5.9% per 100,000 live births each year (Gugsa et. Al, 2016). Though the country was lagging in terms of increasing the educational facilities, it improved its maternal health facilities by increasing access to family planning facilities, access to safe abortion, increasing the number of health centers in areas, which barely had any facilities before. But still, most of the rural and remote areas does not have access to proper health centers and mostly people are not that much familiar with the use of it due to lack of knowledge. Lack of education is keeping them ignorant of the importance of mother's health, proper food intake, vitamin intake and going for routine health checkup during pregnancy. The term "maternal health" needs to be explained to the people especially those who are ignorant, as the term itself describes the importance of the health of mother's during child birth, pregnancy and post pregnancy period including the time of family planning and prenatal care.

2.5. Overview on Education and Maternal Health:

This shows that education is a vital factor for adolescent mothers to improve prenatal care, immunization coverage for both mother and child. This will help us in understanding the effect of education of mothers in Bangladesh on their health and will help me to focus on the main part of the study that I want to present in the paper. As most of the women and their children in developing countries are becoming the victim of health diseases, it mainly shows their lack of knowledge and ignorance in this certain area of motherhood. Though some other aspects like religious, social and cultural sectors of a society are still not mentioned to see the impact on women health, the above-mentioned reasons are the main aspects that should be addressed to improve the health of a nation. This type of improvement on the overall services must be obtained to get a clarity to ensure the strength of both women and their children's health. This kind of explanation would contribute to the country's economy and at the same time might not create any question regarding health assurance of people among the nation. Lessening the health risk of mothers via improved education might make a developing country well developed and economically successful in most of the aspects.

Chapter 3

Research Methodology

3.1. Study Time and Study Setting (Study Area):

A descriptive cross-sectional study was conducted at Zero Clubfoot Clinic of LMRF from July 2016 to December 2016. LMRF is an organization duly registered for children's charity under Social Welfare and NGOAB, working in entire Chittagong division of Bangladesh since 2001. Its key purposes are elimination of clubfoot and cleft lip deformity through providing direct treatment/surgery at free of cost or at minimal cost through Zero Clubfoot and Cure Cleft projects respectively. Under these 2 projects, it treated 3600+ clubfoot patients and performed 6500+ cleft surgeries so far. For this study purpose, primary data was collected with the help of Zero Clubfoot Clinic of LMRF which is located in 07 different districts of Bangladesh: Chittagong, B.Baria, Feni, Laxmipur, Noakhali, \Comilla & Chandpur. This data was collected from July 2016 to December 2016. Data was collected from July 05, 2016 to December 15, 2016 (LMRF, 2001).
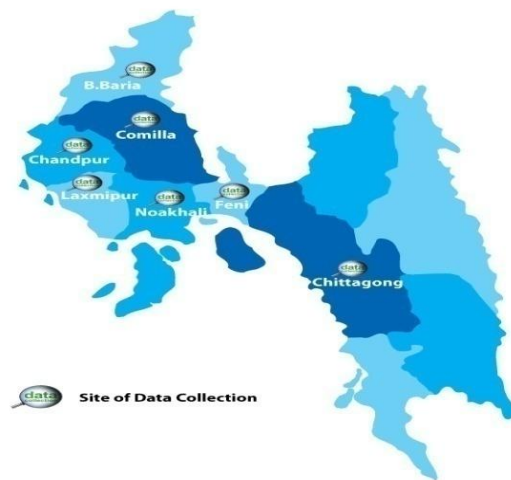
Figure 2: Districts of Bangladesh, Geographical Distribution of Participants.

3.2. Participants Selection & Sampling:

Study participants were selected purposively from those attending the Zero Clubfoot Clinic of LMRF, as the attendee of this Clinique will mostly cover all standards of people from these areas. Participants of this study were beneficiaries of any of these two projects of Zero Clubfoot (ZCF) treating inborn crippling deformity of foot and Cure Cleft (CC), treating in born bifurcation of lip & palate. Mothers having children less than 5 years with or without one of these two inborn deformities were selected as a sample unit. Mother with mental illness and unwilling to take part in the interview were excluded. The sample has been selected based on prevalence of malnutrition mostly and other associated diseases of both adolescent mothers and their children less than five years in Bangladesh. Non-probability convenient sampling technique was used to draw study sample. Considering budget & time constrain I have collected 496 samples.

3.3. Data collection tool development:

A semi-structured survey questionnaire was used to collect data. Several literature and tools were reviewed before finalizing the study tools. The final questionnaire comprised 84 questions which divided into four section: A-General & socio-demographic information (26), B- Pregnancy and delivery related information (29), C- Food and nutrition related knowledge (11) and D- Food and nutrition practices (18). The English version of the questionnaire was translated into Bengali and back translated into English. Field test was done before final data collection to check the suitability of the tools. After, pretesting, necessary modification and rephrasing were done to develop the final questionnaire.

3.4. Data Collection Procedure:

All eligible participants attending at Zero Clubfoot Clinic of LMRF were approached and offered to participate in this study. After describing the purpose of this study those who willingly agreed to sign the consent form were selected as study participants. Interviews were conducted in person in the hospital's waiting room to ensure the privacy. Each interview lasted around 20-30 minutes and enough time was given to participants to minimize recall bias and assumption.

3.5. Data Processing and Management:

All questionnaires were checked manually after the interviews for missing data and inconsistencies, which were cross checked by repeating the question. Internal consistency was checked among the interviewer. Data were entered in Microsoft Excel and after cleaning all data, transferred into the general-purpose statistical software package Stata software version 12. Study findings were verified through internal consistency checking and comparing with other qualitative and quantitative findings.

3.6. Ethical Clearance:

Verbal as well as written (for those who could write) informed consent was taken from the respondents and, they were informed about the purpose of this study. Participation in the study was the beneficiary of ZCF & CC project of LMRF. They voluntarily participated and told that utmost confidentiality will be maintained. The risks and benefits were explained to participants and they were not provided with any sort of compensation. The data will not be used subsequently for any other purpose other than this study and anonymity of individuals will be maintained at all levels of data analysis. They could decline any question that might seem uncomfortable or

sensitive. They could also withdraw and discontinue participation at any time. Severely ill and/or disinterested mothers were excluded from the study sample.

3.7. Procedure:

As all my dependent variables take two values only "1" and "0" that represents 'Yes and No' respectively, so, I need to test the likelihood ratio and to do that I had to run the probit regression.

3.7.1. Probit Regression:

The word "probit" comes from the word's probability and unit (Stephanie, 2016). Probit regression is used when the outcome variables are in binary terms. This means that the dependent variables will only give two likelihoods like yes or no. This regression type estimates the likelihood of a value to fall into one of those yes or no binary variables.

3.7.2. Ordinary Least Square Estimation:

The research model will also follow OLS (Ordinary Least Squares) for some of our continuous variable.

Model:

$$Y_i = \beta_1 + \beta_2 education + \beta_3 fedu + \beta_4 hedu + \beta_5 legalmar + \beta_6 FMEx + \beta_7 hservice + \beta_8 migrant + \beta_9 AoM + \beta_{10} hagri$$
$$+ \beta_{11} hbusiness + \beta_{12} son\_only + \beta_{13} daughter\_only + \beta_{14} medu + \beta_{15} HExp + \beta_{16} FExp + \beta_{17} FMIn$$

Where, Y_i are the health risks indicators that are related to the mother's maternal health, basically the dependent variables and the variables on the right side of the equation are the indicator variables of educational status of the overall family along with the control variables that might have impact on the overall results.

3.7.3. Factor Analysis:

This analysis is used only for "Healthy_Food_Score" variable, as this variable separately will take a lot of time in terms of measuring the healthy diet plan of the mothers. This technique will take maximum variation from all the variables of protein intake, milk intake, vitamin intake and fruit intake variables and put them into a common score, which I named "Healthy_Food_Score". The main aim of factor analysis is to reduce a huge chunk of variables into a smaller number of factors.

3.7.4. Dependent Variable:

Miscarriage, Pregnancy Complicacy, Safe Child Birth & Healthy Food Score.

3.7.5. Independent Variables:

Mother's Education, Husband's Education, Parents Education. (The overall education variable mentioned includes Primary, Secondary, Higher Secondary and Higher level of Education). Here, other than the person's education variable, all other variables are used as a control to see the overall impact and how these variables has an impact.

3.7.6. Control Variables:

The variables that remains constant throughout the research are known as control variables. It is important for any research to have control variables, as they might have a huge impact on the results of any research. In between conducting a research control variable should be removed, as there is high possibility of the correlation of dependent and independent variable to get nullified. For this study, the control variables are Husband's Occupation, Legally married, Age of marriage, Family Expenditure, Family Income, Health Expenditure, Age during Pregnancy, Son only or Daughter only family.

Additionally, to check the robustness of these model logistic regressions can also be done.

Chapter 4

Summary Statistics & Results

To understand the impact of educational status on health risks of adolescent mothers, we see at the marginal effects of all the independent variables that how much the probability of the dependent variable changes, when we change one independent variable keeping other variables constant. We found that, the family with overall good educational background has less health risks for the mothers in some occasions, that is, they have a negative relation. Further, we found that for husbands who are more educated, their wives tend to have less health risks and for fathers with good educational status, their daughter tend to have less health risks. Whereas, women's educational status has a positive relation with having pregnancy complicacy. The summary statistics have been shown in detail in Table 1, 2,3 and 4 in the Appendix section. In table 1 for the probit regression we can see that when higher educational status increases by 1 unit the proportion of having safe child birth increases on an average by 0.42 unit for model 1 and 0.36 unit for model 3, which includes all the control variables. Also, for 1 unit increase in husband's higher education in Table-1, having a safe child birth increases on an average by 0.27 unit and 0.33 unit for model 1 and model 3 respectively. This result of the regression between the dependent and experimental variable shows a positive relationship and are highly significant with or without having any effect of the control variables. Again, in Table-2 (Appendix) we see significant negative relation between husband's and family's education, but positive relation with the mother's education. If husband's or family's higher education increases by 1unit, then the pregnancy complicacy of a mother decreases on an average by 0.29 unit and 0.25 unit respectively, when there are control variables. Surprisingly, mother's education has a positive relation with the pregnancy complicacy. Without control, it (Table-2) shows a very significant result that if mother's

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higher education increases by 1 unit then pregnancy complicacy increases by 0.43 units on an average. But with control variables it doesn't show any significant result, which shows that pregnancy complicacy is not only related on women's education, but other socio-economic factors play a significant role on it. Moreover, in Table-3 (Appendix) we can see that parents educational background especially father's higher education has significant negative relation in his daughter having miscarriage during pregnancy. 1 unit increase in father's education decreases the rate of his daughter facing miscarriage by 0.12 unit on an average. Even husband's secondary education has a significant negative relation in his wife facing miscarriage. I also ran an OLS regression (with and without control variables) to check the relationship of healthy food intake with education background. The results for the OLS regression on Table-4 (Appendix) with and without control variables are significant for husband's education. Without control variables, a one percentage increase in the proportion of husband's higher education is associated with an increase in healthy food intake of their wife by almost 66 percentage points on an average. Again with control variables, a one percentage increase in the proportion of husband's higher education is associated with an increase in healthy food intake of their wife by almost 52 percentage points on an average.

Chapter 5

Data Description & Discussion

5.1. Association between Educational Status & Health Risks:

Table 1-4 shows the results of association between the overall educational status with the health risks of mothers' using the probit regression and OLS estimation methods. The main independent variables are the indicators of educational status along with the other control variables that has an impact like legal age of marriage, husband occupation, family income, family expenditure, age of pregnancy, family with only daughter or son. The dependent variables are the health risks indicators-miscarriage, safe child birth, pregnancy complication, healthy food intake during pregnancy. The results do not follow a consistence pattern for some of the indicators of educational status. The results significantly show that for different educational status, the impacts on health risks are different.

The results obtained are discussed below:

5.1.1. Educational Status of Adolescent Mothers:

Education of adolescent mothers has significant impact on having pregnancy complicacy, safe child breath and vaccine intake. Education of mothers is positively related with pregnancy complicacy, safe child birth and negatively related with miscarriage. The result is significant for safe child birth and for pregnancy complicacy at 0.1% level. The more the mothers get educated they face more pregnancy complication, but it also increases the number of having safe child birth. When higher educational status increases by 1 unit the proportion of having safe child birth increases by 0.42 unit on an average without control variables. We can also see that proportion of safe child birth is increasing by 0.36 unit on an average, when mother's higher education increases

by 1 unit, when including the control variables. This shows that along with the education of mothers' other factors also has a significant impact on the overall health of them. Bhuiya and Streatfield (1991) stated on their study that the behavior of educated mothers is different for boys and girls during pregnancy. However, in this study I did not get any significant impact of mother's education on safe child birth or healthy food intake, when mothers are having only a daughter or only a son in the family. This can be an impact of the social treatment of gender inequality or the cultural context of a country to treat their children in that way, other than the role of education. On the other hand, mothers educational background plays a vital role in taking care of their health, as they get to learn more about health education through their studies.

5.1.2. Husbands Educational Status:

This indicator does not follow the same pattern as the previous one. Here, husband's educational status gives significant results for miscarriage and pregnancy complicacy at 0.1% and 5% level of significance. This indicator is very important for the health of adolescent mothers. The more educated the husband are getting the more it reduces the health risks of mothers. Husband's higher education has significant negative relation with wife's pregnancy complicacy. If higher education of husband increases by 1 unit, on an average the rate of pregnancy complicacy decreases by 0.29 unit. Also, husband's secondary education level has a strong significant negative relation with miscarriage of mothers too. It shows if husband secondary education increases by 1unit, miscarriage rate of their wives decreases by 0.12 unit on an average. But surprisingly, the rate of miscarriage doesn't decrease, when the husbands are gaining higher education. This can be a result of the perception that already creates socially from childhood and education might not bring much change on that thought. So, it is not always that the more husband's get educated mothers are less likely to have miscarriage. Rather, a certain level of education has a significant impact on the

overall miscarriage rate. Adding to that, husband education also has strong significant positive impact on having safe child birth of mother. If husband's higher education increases by 1 unit, the rete of having safe child birth increase by .33 unit on an average. The more husbands get educated; it is more likely for the mothers to have safe delivery. It also has positive relation with healthy food intake of mothers. Mothers tend to take more healthy food and vitamins, when their husbands are educated. Citing the importance of husband's education, Caldwell said that higher educated men plays a more important role in taking care of a child and their medical system compared to the men with less schooling (Caldwell, 1990).

5.1.3. Husbands Occupational Status:

The relation of this indicator is not the same as the previous one. Husband's occupational status gives significant results for pregnancy complicacy only at the same 5% level. The higher-level occupation they have, it is more likely to have pregnancy complicacy for the adolescent mothers. Husbands, who are farming are less likely to provide healthy food and vitamin to their wives, than the husbands who are immigrant or doing service. The immigrant husbands have strong significant impact on health risks like pregnancy complicacy of their wives. Though they are more likely to provide healthy food and vitamins, their wives are more likely to have miscarriage. 1 unit increase in the rate of being immigrant, increases the overall pregnancy complicacy rate by 0.203 unit on an average. For the husband, who are doing service related job, 1 unit increase on rate service related occupation increases the rate of pregnancy complicacy by 0.25 unit on an average. Though the people, who are doing business doesn't have any impact on their wife's health risk. This cannot be well defined by keeping educational background as a reason, as all these sectors of jobs other than service does not require any specific level of education in Bangladesh. There are other factors that has an impact on getting these jobs, rather than having education.

5.1.4. Educational Status of Parents:

It also shows that parents educational status has a significant effect on the overall health of their daughters being a mother. Especially father's educational status has a strong significant negative result with having pregnancy complicacy and miscarriage. The more the fathers are educated the rate of miscarriage and pregnancy complicacy decreases. When father's higher education rate increases by 1 unit, the rate of having miscarriage and pregnancy complicacy decreases consecutively by 0.13 unit and 0.25 unit on an average with 1% significant level. This might be because the daughters are well known of taking care of their health since the childhood and that has an impact in the long run. Also, when parents are educated, it is more likely that they educate their children and as a result the children are aware of the health issues.

5.1.5. Family Members:

For this indicator, it shows a very significant result at 0.1% level, when a family is having only a son or a daughter. Having an only child shows a significant impact on the overall pregnancy complicacy rate. Having an only child, be it a daughter or son, it shows that 1 unit increase of having an only child increases the rate of pregnancy complicacy by 0.26 unit on an average. Depending on the social context, people are more likely to have more kids to secure their future uncertainties. Mostly it is believed that children will look after their parents during the old age and this somehow tends to increase the urge of having more babies (Kimura et al., 2010). Different study shows that frequent pregnancy after having miscarriage increases the likelihood of having miscarriage again. However, due to the lack of education or ignorance majority of the people does not have this knowledge and keeps on trying to have children, which causes a huge negative impact on the overall mother's health. These shows a huge lack of knowledge, which can be lessened through the light of education.

Chapter 6

Policy Recommendations

Most of the policies shows that an educated society would contribute to the society's economy, health structure and reduce poverty, which is the main goal of any developing country. The aim of this study was also to find some valid correlation between education and maternal health. The study gave me some significant relationship between education and some of the factors of measuring the maternal health. But, surprisingly it gave some opposite trend of result then expected from the usual trend of correlation we find from other researches that were conducted before. There is also a possibility that education itself does not have any major impact on most of the maternal health issues in Bangladesh other than some specific heath related factors. A country where other issues like poverty, proper sanitation, lack of residence, etc. has a higher hand on maternal health, might not find education as a major issue for low maternal health. Instead education alone itself can be one of the reasons behind the lower economic development. Considering the few factors that I found can be affected by education of the family members or the mother itself, some policies can be recommended on the context of this thesis. The educational institutes of the government and non-government organization, health institutes of the country, can also use this study results to improve the educational and health condition of the country with the strategy used for developing these sectors. This study will also contribute to CEU's academic resource, by having a positive impact on the people widely coming from diverse academic area and culture, which might help their community in the long run in terms of this kind of problems.

Depending on the analysis and the country's overall condition, this study proposes some key policy implications:

i.Increasing Access to Educational Institute: The study shows that mother's with higher educational background have lesser chance of miscarriage and higher probability of having a safe child birth, where both the mother and child are healthy. It is also the same relation in case of their husband's and father's educational background. It shows that the overall educational background is playing a significant role in improving the condition of having a safe child birth and decreasing the miscarriage rate.

- The government can give more importance to the overall educational status of the nation. It can implement a policy that students should at least complete their secondary education to receive any kind of government facilities for higher studies. To ensure their education, the government can give some incentives like giving a stipend/scholarship after the completion of studies each year. Though this will be infeasible for the government in the short run to provide the facilities, this policy can help getting a more educated young generation and a healthy nation in the long run.

- The government can invest more in the educational institutions by providing special transport only for those who are coming from distant areas, study loans at least till the secondary schooling, free stationaries and books. Most importantly the government can establish schools in the rural areas, where most of the students gets dropout from school due to lack of communication facilities.

This young population will contribute to the country's future economic status with time and the overall population will know more about health education, which will decrease the health risks of the mothers. As our study shows that overall family's education has an impact on maternal health, these policies will decrease the health risks in the long run. Although at the beginning this policy seems costly for the government, but this would be the more efficient and effective policy for the

welfare of the country, as the cost of secondary expense will be returned in increasing return in form of the youth's income from both male-female and build a healthy nation. The extra expense that the government spends on the health sector for decreasing mortality rate might be saved by this policy.

ii.**Introducing Health Facilities & Improved Health Centers:** As the study shows that other than pregnancy complicacy, miscarriage, and safe child birth most of the factors related to maternal health are not connected with access to education in Bangladesh, this might be possible that there is no major connection between education and maternal health.

- So, in case of focusing on maternal health, the government should increase their budget in providing proper access to hospitals and health centers, especially in the rural area and should ensure that the help is reaching out to them properly. As many of the remote areas of Bangladesh are still deprived of having hospitals or health centers, measures to build health centers in those areas will help to decrease the health risks that the mothers are facing.

- These centers can also provide information about sanitation and start campaigning for healthy education in remote places, which the village people are lacking behind from the city dwellers. Proper access to health center and knowledge of health education can improve the overall health of them and help the country's economy. People who live in villages are less likely to have access to the health center and to have shortage of medical facilities like doctors' appointment, modern technology and advanced treatment like the cities. Study shows that majority of the women's facing maternal health problem are coming from rural areas, due to the lack of proper health knowledge (Tsawe & Susuman,

2014). So, health education and health facilities are mostly important for those, who are staying in remote areas.

Less use of maternal health facilities in rural Bangladesh is also a result of financial instability, social misbeliefs, cultural practice like using traditional way of giving birth instead of professional way of birth. All these misbeliefs and abnormal practices can only be removed by introducing health education to these specific areas. But this policy might face administrative infeasibility and will require a huge budget and time from the government, which is a long-term process for them to provide. Though long term, it would not be impossible for the government to keep this measure in mind for the long run benefits.

Chapter 7

Conclusions

The government should play a vital role giving more importance to mother's health and especially education. A country, where the mothers will face fewer health risks needs proper education system. Educational status of a person in a family is one of the important indicators of health risks. This study shows that the more educated the family are, it is more likely for the mothers to have safe delivery. This happens due to the proper gain of knowledge and health education. When a mother is educated, she knows the proper measures of health care and tends to maintain it accordingly. Other factors, husband's and overall family's educational status plays the most vital role among all of them. The study shows that educated husbands wife tend to have less health risks comparing to the less educated one. The more he gets educated he knows more about the proper take care of adolescent mother. Also, it shows that educated fathers tend to have healthy daughters, who faces less health risk being a mother. Still, the study does not show the importance of education on all the factors of maternal health, despite pregnancy complicacy, miscarriage, healthy food intake and safe child birth. For a country like Bangladesh, where providing basic needs like food, shelter, water and sanitation are difficult, the basic need of education comes later after meeting these needs. Before education, the lack of food, water and sanitation will get an upper hand to have an impact on maternal health. The government can increase their budget in providing proper access to educational institute and introducing health education, especially in the rural areas and should ensure that the knowledge is reaching out to the people properly. Proper gain of knowledge and access to education can improve the overall health of family members and help the country's economy to flourish in the long run.

7.1. Limitations:

The results of the study could be limited by several factors. First, the study relied on the self-reports of the adolescent mothers. Though they responded, there was a problem of response bias, while doing this survey. Respondents tend to avoid some of the questions, which limited the study. Another limitation is the lack of information that occurred due to declined response from participants. Most of the participants declined to answer almost the same questions, which also limited the study for collecting few of the data.

Appendix:

Table 1: Probit Estimates of Overall Health Outcomes of Mothers (Safe Child Birth)

	Safe Child Birth1	Safe Child Birth2	Safe Child Birth3
	b/se	b/se	b/se
edu2 (d)	0.142927	0.132974	0.132648
	(0.09)	(0.10)	(0.10)
edu3 (d)	.2940046**	.2695491**	.2608564**
	(0.09)	(0.10)	(0.10)
edu4 (d)	.41998***	.3754004***	.364641***
	(0.06)	(0.08)	(0.08)
edu5 (d)	.4238124***	.3228994*	.31597*
	(0.05)	(0.15)	(0.15)
hedu2 (d)	0.14386	0.137264	0.138781
	(0.08)	(0.09)	(0.09)
hedu3 (d)	0.125061	0.120279	0.115534
	(0.08)	(0.09)	(0.09)
hedu4 (d)	0.132356	0.143488	0.143975
	(0.10)	(0.11)	(0.11)
hedu5 (d)	.2700647**	.3383887***	.3257239**
	(0.10)	(0.10)	(0.10)
fedu2 (d)	0.026506	0.043762	0.000396
	(0.06)	(0.06)	(0.07)
fedu3 (d)	0.051729	0.037798	-0.01022
	(0.07)	(0.08)	(0.09)
fedu4 (d)	-0.13453	-0.1668	-0.21274
	(0.11)	(0.11)	(0.12)
fedu5 (d)	0.219767	0.209102	0.16025
	(0.18)	(0.19)	(0.22)
legal_mar ~)	0.023538	0.0196	0.017623
	(0.05)	(0.05)	(0.05)
AoM	-0.0024	-0.00249	-0.00225
	(0.00)	(0.00)	(0.00)
FMEx	1.54E-06	3.02E-07	4.68E-08
	(0.00)	(0.00)	(0.00)
HExp		5.82E-06	6.76E-06
		(0.00)	(0.00)
Fexp		-1.16E-06	-1.34E-06
		(0.00)	(0.00)
FMIn		4.51E-07	5.14E-07

		(0.00)	(0.00)
AP		0.007211	0.007639
		(0.01)	(0.01)
house_wife~)		0.004171	-0.00278
		(0.11)	(0.11)
hagri (d)		-0.10198	-0.10663
		(0.09)	(0.09)
hservice (d)		-0.03738	-0.03266
		(0.09)	(0.09)
hbusiness ~)		0.061673	0.053303
		(0.08)	(0.08)
hmigrant (d)		0.103431	0.099942
		(0.08)	(0.08)
son_only (d)		0.061351	0.066422
		(0.06)	(0.06)
dau_only (d)		-0.03392	-0.02905
		(0.07)	(0.07)
medu2 (d)			0.108309
			(0.06)
medu3 (d)			0.086243
			(0.10)
medu4 (d)			0.057768
			(0.20)
medu5			
N	483	418	417

Marginal effects
Note: *p**p***p<0.01

Table 2: Probit Estimates of Overall Health Outcomes of Mothers (Pregnancy Complicacy)

	PrgC 1	PrgC 2	PrgC 3
	b/se	b/se	b/se
edu2 (d)	.2059244*	0.126985	0.134857
	(0.10)	(0.11)	(0.11)
edu3 (d)	.2621317**	0.176454	0.183506
	(0.09)	(0.10)	(0.10)
edu4 (d)	.3454819**	.3116076*	.3225334*
	(0.11)	(0.13)	(0.13)
edu5 (d)	.4363517***	.3767074*	0.320536
	(0.11)	(0.17)	(0.20)
hedu2 (d)	-0.04897	-0.04898	-0.05654
	(0.08)	(0.09)	(0.09)
hedu3 (d)	-0.10664	-0.16141	-0.15887
	(0.08)	(0.09)	(0.09)
hedu4 (d)	-0.14444	-.2483087*	-.2536853*
	(0.10)	(0.10)	(0.10)
hedu5 (d)	-0.06585	-.2743672*	-.2886701*
	(0.13)	(0.12)	(0.11)
fedu2 (d)	-.1397367*	-.1956874**	-.1807108**
	(0.06)	(0.06)	(0.07)
fedu3 (d)	-0.12065	-.1542522*	-0.15045
	(0.07)	(0.08)	(0.08)
fedu4 (d)	-.2278802**	-.2509194**	-.2501764*
	(0.08)	(0.10)	(0.10)
fedu5 (d)	-0.01276	-0.00936	-0.02269
	(0.16)	(0.18)	(0.19)
legal_mar ~)	-.115243*	-0.06416	-0.06056
	(0.05)	(0.05)	(0.05)
AoM	0.001088	0.002145	0.002184
	(0.00)	(0.00)	(0.00)
FMEx	-1.87E-06	-.0000103*	-9.82e-06*
	(0.00)	(0.00)	(0.00)
HExp	469	1.73E-06	1.17E-06
		(0.00)	(0.00)
Fexp		-4.53E-07	1.13E-08
		(0.00)	(0.00)
FMIn		5.33E-06	5.04E-06
		(0.00)	(0.00)
AP		-0.00499	-0.00453
		(0.01)	(0.01)
house_wife~)		-0.01231	-0.02491

		(0.10)	(0.10)
hagri (d)		0.045804	0.031346
		(0.09)	(0.09)
hservice (d)		.2557505**	.2543856**
		(0.08)	(0.08)
hbusiness ~)		0.117389	0.117247
		(0.08)	(0.08)
hmigrant (d)		.2168315**	.2036256*
		(0.08)	(0.08)
son_only (d)		.2687085***	.2681828***
		(0.06)	(0.06)
dau_only (d)		.272025***	.274184***
		(0.07)	(0.07)
medu2 (d)			-0.06581
			(0.07)
medu3 (d)			0.082145
			(0.10)
medu4 (d)			-0.03789
			(0.24)
medu5			
N	469	407	406

Marginal effects
Note: *p**p***p<0.01

Table 3: Probit Estimates of Overall Health Outcomes of Mothers (Miscarriage)

	Miscarry 1	Miscarry 2	Miscarry 3
	b/se	b/se	b/se
edu2 (d)	.0934669	.0745328	.0685444
	(.0890246)	(.0915024)	(.0899673)
edu3 (d)	.0567002	.0603988	.066294
	(.0700428)	(.0734073)	(.0719754)
edu4 (d)	.0658832	.0632462	.0714835
	(.109355)	(.1170632)	(.1193655)
edu5 (d)	.1904862	.2019395	.249611
	(.1946825)	(.2765302)	(.2965388)
hedu2 (d)	-.1185968**	-.1226012**	-.1196813**
	(.0413756)	(.0435689)	(.0429045)
hedu3 (d)	-.06679	-.0468101	-.0544812
	(.0508483)	(.0586758)	(.0578236)
hedu4 (d)	.0005524	.0120274	.0001629
	(.0695041)	(.0816465)	(.0786624)
hedu5 (d)	-.0005586	-.0138282	-.0052509
	(.0898471)	(.1108236)	(.114245)
fedu2 (d)	-.0139516	-.0167163	-.0044366
	(.040893)	(.0424003)	(.047523)
fedu3 (d)	-.0250128	-.03036	-.0184319
	(.0506123)	(.0503275)	(.0566356)
fedu4 (d)	-.0031991	.0284035	.0425504
	(.0667938)	(.0790393)	(.0885631)
fedu5 (d)	-.1213562*	-.0958212	-.1290406***
	(.0498919)	(.0764377)	(.038973)
legal_mar ~)	-.0345452	-.0487538	-.0466555
	(.033938)	(.0362495)	(.0359917)
AoM	-.0007775	-.0011658	-.001136
	(.0010679)	(.0010445)	(.0010294)
FMEx	-8.52e-07	2.59e-07	2.52e-07
	(9.29e-07)	(1.23e-06)	(1.21e-06)
HExp		-1.17e-06	-1.23e-06
		(1.97e-06)	(1.91e-06)
Fexp		-6.65e-06*	-6.61e-06*
		(2.64e-06)	(2.58e-06)
FMIn		-2.83e-07	-2.22e-07
		(2.20e-07)	(2.08e-07)
AP		.0014799	.001465

		(.0039024)	(.0038571)
house_wife~)		-.0537814	-.0454027
		(.0792545)	(.0778453)
hagri (d)		.0492913	.0618102
		(.073818)	(.0760262)
hservice (d)		.1151206	.126754
		(.0750269)	(.0782461)
hbusiness ~)		.0804856	.0837057
		(.065747)	(.0668164)
hmigrant (d)		.0835238	.1091643
		(.0717818)	(.0763225)
son_only (d)		.0116241	.0116856
		(.0407476)	(.0403628)
dau_only (d)		.0426365	.0357876
		(.0521976)	(.0517673)
medu2 (d)			-.0259468
			(.0453155)
medu3 (d)			-.0626412
			(.0513523)
medu4 (d)			.3797334
			(.2407242)
medu5			
N	479	415	414

Marginal effects
Note: *p**p***p<0.01

Table 4: OLS Regression for Overall Health Outcomes of Mothers (Health_Food_Score)

VARIABLES	(1) Health Food Score	(2) Health Food Score
edu2	0.01	-0.01
	(0.169)	(0.163)
edu3	0.20	0.06
	(0.162)	(0.157)
edu4	0.29	0.17
	(0.201)	(0.203)
edu5	0.19	0.31
	(0.290)	(0.354)
hedu2	0.01	0.08
	(0.139)	(0.147)
hedu3	0.14	0.10
	(0.133)	(0.146)
hedu4	0.41**	0.33*
	(0.162)	(0.172)
hedu5	0.66***	0.52**
	(0.185)	(0.218)
fedu2	-0.11	-0.18*
	(0.095)	(0.106)
fedu3	0.00	-0.13
	(0.106)	(0.120)
fedu4	-0.29*	-0.39**
	(0.149)	(0.158)
fedu5	-0.04	-0.45
	(0.240)	(0.285)
legal_mar	0.06	-0.11
	(0.077)	(0.079)
AoM	0.01***	0.01***
	(0.003)	(0.003)
FMEx	0.00***	0.00
	(0.000)	(0.000)
medu2		0.27***
		(0.100)
medu3		0.20
		(0.138)
medu4		0.41
		(0.357)
medu5		0.56*
		(0.335)
HExp		0.00**
		(0.000)
Fexp		0.00*
		(0.000)

hagri		0.11
		(0.143)
hservice		0.36***
		(0.121)
hbusiness		0.26**
		(0.122)
hmigrant		0.30**
		(0.126)
son_only		-0.12
		(0.093)
dau_only		-0.10
		(0.105)
Constant	-0.62***	-0.33
	(0.196)	(0.317)
Observations	451	389
R-squared	0.142	0.201

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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