Domestic Violence against Women and Children's Nutritional Health Outcomes: A Bargaining Power Approach in Pakistan

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Abstract: **- This paper mainly aims to examine the effects of domestic violence on maternal and children health using bargaining power model. The proposed model represents how domestic violence weakens woman's stability and influences her health care decisions by declining the probability of health inputs. Data from Pakistan Demographic and Health Survey (2012-13) is used and 13,558 women (aged 15-49) are arbitrarily chosen from different regions of Pakistan. A bargaining power approach is used to check the various impacts of domestic violence on mother's health inputs (antenatal visits, iron intake, breastfeeding and prenatal care) and children's nutritional health outcomes (stunting, wasting and underweight). In order to estimate the probability of women's health inputs and children's health outcomes, probit estimation technique is used. OLS technique is also used to analyze the reduced-form specification of mother's health inputs (number of antenatal visits). Results showed that domestic violence reduces the probability of woman's iron intake, breastfeeding and prenatal care by 10.8, 24.5 and 6.7 percent, respectively. Physical violence increases the probability of under nutrition (stunning, wasting and underweight) among children by 10.4, 10.9 and 15.0 percent, respectively. On the basis of empirical results, this study proposes auxiliary efforts for condensing high prevalence of domestic violence and its afterwards detrimental effects on maternal and child's health. Initiatives and programs are required on urgent basis for progressing women's empowerment, through easy access to education and economic opportunities that may not only counteract the risk of domestic violence but also improve the long term growth of many children in Pakistan.**

Keywords: **Domestic violence, women's bargaining power model, mother's health inputs, children's health outputs, Pakistan.**

JEL Classification: **J1, J12, J13, I15, J10**

I. INTRODUCTION

The common phenomenon of domestic violence has been confronted as a universal problem for its evil impacts on socio-economic and health areas (Heise, et al., 2002). The most widespread types of violence are physical and sexual exploitation of women by a close partner/husband (WHO, 2013). Exploitation of this class has been linked with a wide range of severe physical and psychological health problems. Women are more likely to suffer various physical, psychological, sexual and reproductive health disorders; for instance, melancholy, depression, physical injury, STD[1], and adverse pregnancy outcomes like anemia, still birth, miscarriages and low birth weight (Schei and Bakketeig 1989; Gasmararian, et al. 1995; Dietz, et al. 1999; Parker, et al, 1994; Golding, 1996; Curry, et al. 1998; Martin, et al. 1999). This paper mainly aims to examine the effects of domestic violence on maternal and children's health using women's bargaining power model. Although, in previous researches, this model has been used widely but this study tried to apply and analyze the bargaining power model, empirically. The proposed model also represents how domestic violence weakens a woman's stability and influences her health care decisions by declining the probability of health inputs. The estimation approach also allowed in distinguishing among different pathways through which domestic violence could influence women's health care during and after pregnancy and children's health. Figure 01 simply illustrates a diagrammatic pathway through which domestic violence could influence women's health care during and after pregnancy along with children's nutritional health outcomes. On the one hand, domestic violence may possibly have a direct effect on the expected child due to wife's beating during pregnancy. On the other hand, domestic violence directly may affect mother's health (dietary and psychosomatic status of women) and health inputs (quality of care woman achieves during and after pregnancy). Consequently, child's weight at the time of birth and his overall health status may also be affected. Generally, women, undergo from domestic violence, are at higher risks of poor health. Furthermore, a way through which domestic violence influences children's nutrition is associated to the demand for women's health inputs. Specifically, domestic violence lowers down the woman's bargaining power and consequently, affects her aptitude to formulate decisions

[1] Sexually Transmitted Diseases

regarding health care and nutrition of children. Rest of the study is structured as follows; section 2 provides reviews of literature on the prevalence of domestic violence and its effects on women and children's health, section 3 outlines the simple theoretical framework of bargaining power, section 4 discusses the methodology, data, variables computations and estimation strategy, section 5 is based on empirical results of descriptive and empirical analysis and last part briefly describes conclusions and policy implications.

II. LITERATURE REVIEW

This segment is simply divided into three parts. First section highlights the studies of domestic violence, reflecting how domestic violence weakens the relative bargaining power of woman in the intra-household decisions regarding own and children's health. Second segment describes how domestic violence along with some other demographics and socio-economic characteristics influences reproductive health care of women during and after pregnancy. Third part systematically reviews the studies to determine how domestic violence has an effect on the factors associated with children's nutritional outcomes i.e. stunting, wasting and underweight.

2.1 Domestic violence against women and Intra-household bargaining power

In this section, an effort has been made to describe the measures of intra-household women's bargaining power and how do they affect the allocation of resources. Lundberg and Pollak (1994) make uses of a non-co-operative bargaining model theoretically and concluded that sharing income between husband and wife may depend on the control over resources. Likewise, Friedberg and Webb (2005) discovered that power of decisions making depends on the share of household's earnings of both husband and wife and its allocation depends on bargaining power. Moreover, besides income and asset ownership, other researchers included other measures of bargaining power for example, level of education, variations in social settings and assets brought by woman in marriage (Quisumbing, 2000; Beegle, et al., 2001; Maitra, 2003). Although, the association between domestic violence and the bargaining power of woman is acknowledged in few studies but no definite causality between these two has been found yet. Tauchen, et.al (1991) used a non-cooperative model of the household that includes domestic violence as a factor of sharing well-being between partners. Koenig, et.al (2003) designed a model of domestic violence as a function of background determinants, household and person's own characteristics and women's empowerment. Physically abused women are likely to have less control over resources, less freedom of mobility to medical and health services, which results in both mental and physical illness and health related multiple issues. A multinational study, carried out by the WHO[2] (2004), concluded that abused women either physically or sexually by a spouse had a considerably higher probability of physical injuries, emotional suffering and suicidal deliberations (Garcia, et al., 2005). Beegle, et al. (2001) exercised some measures of bargaining power to find the sway on reproductive health within household in Indonesia. They investigated the husband and wife's assets ownerships, differences in the education, disparities in socio-economic status and educations of both partner's fathers. The study finally concluded that bargaining power directly influences the reproductive health decisions within the household because the women who own physical assets are more likely to exercise modern reproductive health services in contrasted to those who do not have. Haroon, Hussain, et al. and Mehwish, et al. used PDHS (2012-13) data and found that empowerment magnitudes might reduce the possibility of domestic violence due to women's intra-household decision, and different socio-demographic characteristics like media exposure, educational level of partners, working status, wealth status etc.

2.2 Domestic violence against women and reproductive health care during and after pregnancy

Due to the lack of data, work on domestic violence is limited. Even though, efforts are being made to deal with violence towards women of childbearing age (15-49), there have been a small number of studies focusing on domestic violence at some stage in pregnancy. The domestic violence plays a considerable role in reducing antenatal and prenatal care attendance and also mother's health care activities during pregnancy. A few researches are done on violence prototypes (Olagbuji, et al., 2010), whereas some are made on risk factors and complications as a result of violent behavior (Romero-Gutierrez, et al., 2011). Some emphasized on domestic violence meddling with woman's reproductive health care looking behaviors, like timely prenatal care (Koski, et al., 2011). Black and Breiding (2008) discovered many risk factors related to women's domestic violence, including smoking, alcohol and drug exploitation, melancholy, low confidence, desperate ideations and other medical setting. Moreover, researchers have disagreed that domestic violence behavior are communally modeled and its effect fluctuates across background, based on cultural multiplicity among demographic locations that inversely influences how women sufferers react to domestic violence activities. Antenatal care is very necessary element of mother's reproductive health and newborns during pregnancy (McCarthy and Maine, 1992). Earlier studies have proposed that demographic, socio-economic and behavioral factors including age of woman, time and expenditure of voyage to health care centers, large family size and low access to community support are related with poor antenatal care turnout (McCray, 2004). A work on maternal health care across Sub-Saharan African countries found that low education, rural dwelling together with low household income are all related to less number of antenatal visits (McTavish, et al., 2010). Breast milk is indisputably the model requirements for the healthy growth and cognitive growth of children

[2] World Health Organization

(Bandara, et al.; WHO, 2013). Breast feeding practices, for example, decision to begin breast feeding or not, recommend formula milk, duration of breast feeding, could be effected by various factors. These include weight at birth, age of mother, education, socio-economic status, income, maternal anxiety and symptoms of depression, social network, parent's routine dietary plans and living environment (Kramer, 2002; Fein, et al. 2008; Lutter, 2013; Hughes, et al. 2013). Previous researches proved that households with violent situation weakened the worth of mother and aptitude of husband and wife to manage child's nutritional requirements. As a result, the prospective to look after child's nutrition is affected badly (Victora, et al. 2013; Ramos and Stein, 2000; Kong and Lee, 2004). The literature on the issue is very limited and the outcomes of different studies are conflicting. A few works give evidences about the significant relationship between domestic violence and breastfeeding, but many had not discovered a considerable relationship between the two (Bullock and Libbus, 2001; Silverman, et al. 2006; Lau and Chan, 2007; Moraes, 2011). Prenatal care visits encourage high-quality health during the conception period, as they raise the probability of early testing, care that is based on an underlining medical checkup and prescriptions, and potential utilization of a trained and professional attendant at delivery. Nevertheless, studies dealt with domestic violence and mother precautionary health services revealed that women who experienced domestic violence are known to have an exclusive obstruction to preventive health care access, like prenatal care visits (Wilson, et al., 2007). McCloskey et al. (2007) discovered the relationships between husband's intervention with women's reproductive health care visits and searches for prenatal care throughout and after pregnancy. It was discovered that domestic violence limits women's educational attainment and employment prospective. Women, especially younger, who experience domestic violence, usually receive less education or often lose jobs, get low wages, and work fewer weeks in a year (Adams, et al., 2013; Meisel, et al., 2003). Domestic violence deviates across traditions and socio-economic status, and a society with an inherent socio-cultural outlook towards it recognized as a key interpreter of violence against women and a fence for its alleviation (Garcia-Moreno, et al., 2006). In addition, pregnancy related domestic violence itself a community health issue, as violence incidence is likely to begin or deepen during pregnancy and the prenatal phase (Diaz-Olavarrieta, et al., 2007). Pregnancy related domestic violence is concerned for high peri-natal and neo-natal mortality hazard amongst victim women as compared to non-victim pregnant women (Ahmed, et al., 2006).

2.3 Domestic violence against women and children's nutritional health outcome

Altarac and Strobino (2002) and Hobel and Culhane (2003) claimed that the impacts of domestic violence is not only confined to psychological and physical vulnerabilities but also related to mal-nutrition of children., Bhagowalia, et al. (2012) studied the relationship between domestic violence and child under nutrition in Bangladesh and concluded that poor psychological health, less control over economic resources, low decision making and less access to health care services. Rahman, et al. (2004) conducted a potential study in rural areas of Pakistan and exposed that infants have more growth abnormalities in their childhood phase whose mothers have gone through violence. Yount, et al. (2011) found that domestic violence causes harmful consequences on child's weight at birth and development in the initial two years with more possibilities of being stunted at two years of age and small height at seven years as well as in later life. found that some potential factors also lead a child to be stunned is probably in the course of biological and behavioral paths by means of unfavorable impacts on fetal development and pregnancy ending in company with own and child care. The relationship of various income groups and stunting children is obvious. A noteworthy difference is found in under nutritional rate among women and children belonging to lowest wealth quintile in contrasted to the highest wealth quintile. Cesare, et al. (2015) reported that children who belong to rich quintiles are better fed and nourished compared to those who are living under deprived and poor households in Pakistan. IFPRI (2008) reported that for empowering women, different social security interferences are required in less developing countries i.e. cash transfer, programs of micro credits and agricultural development. These interferences help in raising purchasing power and empowerment of women for making better decisions regarding own and children's health care with predictable encouraging high-quality nutritional requirement of children.

III. THEORETICAL FRAMEWORK

This segment represents a simple theoretical model that shows the impact of domestic violence on children's nutrition through one more pathway[3] i.e. demand for health inputs. This study employed a non-unified preferences structure to discover the influences of women's bargaining power on decisions regarding health inputs and consecutively, the effects of health inputs on children's nutritional health outcomes. Theoretical framework is based on a modified version of a household structural model proposed by Maitra (2004)[4]. The individuals are assumed to maximize a utility function subject to the budget constraints, vector of commodity and inputs prices, wages of individuals, household's total income and assets. Appendix A provides the detail of utility maximization model.

[3] The first two pathways including beating during pregnancy and the women's physical and mental health (showed in figure 01) can be predicted to have an inverse effect on child's health.

[4]This work tried to modify the model by revealing the effect of domestic violence, especially focusing on the children's nutritional health outcomes.

IV. METHODOLOGY

4.1 The Data

The study used data from Pakistan Demographic and Health Survey (2012-13) and 13,558 women (aged 15-49) are arbitrarily chosen from Gilgit Baltistan, Islamabad and four regions i.e. Punjab, Sindh, Khyber-Pakhtunkhwa and Balochistan of Pakistan.

4.2 Variables Descriptions and Computations

4.2.1 Dependent variables of women's health inputs

The estimation of four dependent variables of women's health inputs (number of antenatal visits, intake of iron tablets/syrups during pregnancy, child's breastfeeding and prenatal care from a trained health professional after delivery) are carried out. Women's antenatal visits play very crucial role because complications during pregnancy and childbirth have been revealed to be a main reason of death among women in less developing countries (WHO, 2014). *Firstly,* women's antenatal visit is computed by considering the number of visits to health professional before delivery. It is hypothesized that woman who experience domestic violence during pregnancy utilizes poor antenatal care attendance. Breastfeeding is considered as the most significant factors of child's survival, birth spacing, and prevention against infancy diseases. *Secondly,* a set of dummy to specify whether the child was breastfed and immunized or not is computed. It is anticipated that domestic violence may affect adversely the physical condition of abused woman during the initiation or delaying breastfeeding practice. Requirement for micro-nutrients rises considerably throughout pregnancy, and mother's insufficiency of iron and iodine are accounted to be interconnected with unfavorable birth endings, like low birth weights (Ramakrishnan, et al. 2012; Zimmerman, 2012). Mother's iron deficiency, anemia and premature pregnancy put the woman at higher risk of considerable reduction in fetus growth and further development, pre-term birth or low birth weights deliverance (Allen, 2000; Scholl, 2005). *Thirdly,* a dummy is computed as 1 if woman takes iron tablets during pregnancy and zero otherwise and hypothesis tests that whether or not domestic violence reduces woman's intake of iron during pregnancy. Prenatal care means the medicinal health check-ups and screening examination which assist in keeping mother and child healthy throughout pregnancy. *Fourthly,* for arresting the impacts of prenatal care, a dummy variable is constructed and proposed hypothesis will help to test that whether or not, prenatal care is badly affected by domestic violence.

4.2.2 Dependent variables of children's nutritional health outcomes

Children under nutrition are considered as main community health dilemma. The study aimed to review studies systematically for determining the factors related to children's stunting, wasting and underweight. So, for measuring the nutritional health outcomes of children, three dependent variables are constructed as dummy variables for identifying if the child is either moderately or severely stunted, wasted or underweight. The study used PDHS calculations of z-scores for height-for-age i.e. stunting, weight-for-height means wasted and weight-for-age stands for underweight[5]. Stunting shows the indications of chronic malnutrition, wasted shows the signs of acute malnutrition, whereas underweight reveals the effect of both chronic and acute malnutrition.

4.2.3 Independent Variables

The study mainly highlights the domestic violence against women and distinguished its two different kind i.e. physical violence and emotional/psychological violence. Physical violence describes the act that causes physical damage. It is calculated by inquiring woman the subsequent questions and if she answers "Yes" to any one or more of statement she is being constituted the evidence of physical violence. Husband's act of any physical violence against his wife includes;

i) Pushing, shaking or throwing something
ii) Slapping
iii) Twisting arm or pulling hair
iv) Punching by own fist or with something else
v) Kicking, dragging or beating
vi) Act for strangling or burning
vii) Threatening or attacking by a weapon (knife, gun etc.)

Emotional/psychological violence refers to words or actions that destroy or harm a woman's belief in her. It includes; embarrassing comments, community mockery, coercion, threats, forced captivity, isolation, instilling terror, nuisance, frequent inspection, forced to watcher, injury to preference and quiet conducts etc. A woman is considered to have experienced emotional/ psychological violence when she answers to at least one of the subsequent questions. Husband's act of any emotional/psychological violence against wife includes;

i) Saying or doing something to disgrace
ii) Threatening for hurting or harming
iii) Insulting or making feel bad
iv) Feelings of jealousy when seeing her talking with some other males
v) Accusing for unfaithfulness
vi) Restricting meetings with close female fellows
vii) Limiting contacts with own family members
viii) Constraining mobility

Two sets are used for measuring the domestic violence. *Firstly*, a dummy for two kinds of violence is exercised i.e. physical and emotional. *Secondly*, an aspect of physical violence based on the result of violence is used, showing that

[5] These measures were computed by employing the standard deviation derived growth reference curves (CDC) taken from the NCHS/FELS/CDC reference population

whether the woman had gone one of the subsequent consequences after experiencing violence like bruises, injuries or broken bones, and whether she had gone to avail health service or not. Table 01 comprises a detail description of independent variables, used in empirical study. The proposed theoretical model signified the regressions control for demographics characteristics of household by including its size, age and sex of household's head. For arresting the influences of regional peculiarities, dummy variables are computed i.e. place of residence. It is expressed as equal to 1 if household is a residence of rural area and 0 otherwise. Six separate dummies are constructed for Punjab, Sindh, Khyber-Pakhtunkhwa, Balochistan, Islamabad and Gilgit Baltistan. The poorest, poorer, medium, richer and richest quintiles are treated as continuous variables by assigning weights as 1, 2, 3, 4 and 5, respectively. Moreover, model controls a set of covariates, representing the other characteristics of the dwellings. It includes; floor material (natural-earth; rudimentary-wood planks or finished-cement, marble, tiles), flushing toilet, water piped into household, yard or building and the availability of electricity. A dichotomous variable is generated capturing the value 1 if the household has any of the above mentioned facilitates and zero otherwise. A dummy is created for physical assets, taking the value of one if household has one of the following assets i.e. radio, television, refrigerator, bicycle, car or motorcycle and zero otherwise. A dichotomous variable is computed to represent women's access to any mass media like newspaper, magazine, TV or radio by taking the value of one if woman gets access to any of the media and zero otherwise. Various characteristics of child are also included in the model to look the nexus among women's health inputs and domestic violence. Sets of dummy variables are generated by taking the value of 1 if the child is from multiple births or child is male or if he lives somewhere else and zero otherwise. Age of child (months) is measured as continuous variable. Age of women is divided into two groups i.e. less than 18 and above 35 years, for estimating the effects of health's inputs in younger and older aged women. Woman's education is a very crucial determinant and divided into four groups i.e. no education, primary education, secondary education and higher education. Dummy variable is computed for each level of education. Education of husband is used in the equivalent manners as women's education. Health inputs are also checked by the insertion of employment or working status of woman and dummy is designed as 1 if woman is working for pay and 0 otherwise. The effects of bargaining power on women's health inputs are also tested by the inclusion of decision making determinants. An index is created by assigning different weights to women's own health decision. This index quantifies the degree of women's participation in health care affairs i.e. decisions regarding her own health; either independently, in co-operation with partner, or in co-operation with some other members of family. All responses are measured on the basis of 3 point rating scale by assigning score 0 that represents decision is made by partner alone, 0.5 represents decision is made by husband and wife (joint) and 1 represents that decision is made independently by women on healthcare affairs a complex variable is computed i.e. pregnancy risks, by creating a dummy that takes the value 1 if the woman has any of the subsequent complexities: less than 18 years of age or above 35, less than 24 months have onwards since preceding delivery, and given birth to more than 4 children[6] and zero otherwise. The robustness of gender differences by including age and educational difference between husband and wife (years) are also checked. Continuous variables are made by deducting the age and education of women from husband's age and education.

4.3 Estimation Approach

4.3.1 Probit Model

In order to estimate the probability of women's health inputs (intake of iron tablets during pregnancy, whether the child was breastfed and prenatal care after delivery) and child nutritional health outcomes (stunning, waste and underweight), probit estimation technique is used. The subsequent formula is used for estimating probit model;

$$p = pr\left(y = \frac{1}{x\beta}\right) = \Phi(x'\beta) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (i)$$

$$F(x'\beta) = \Phi(x'\beta) = \int_{-\infty}^{x'\beta} \Phi(z)dz \dots\dots\dots\dots\dots\dots (ii)$$

$F(x'\beta)$ Cumulative distribution function of standard normal distribution

The predicted probabilities are limited between 0 and 1. OLS estimation technique is also used to analyze the reduce-form specification of mother's health inputs i.e. number of antenatal visits.

V. RESULTS AND DISCUSSION

5.1 Descriptive Analysis

5.1.1 Measures of domestic violence and women's health inputs

Table 02 represents the comprehensive descriptive statistics of each variable for all samples and sub-set of households with and without domestic violence. The statistics of all sample indicated that nearly 28 percent of women have gone through the experience of physical violence and out of which 28 percent have been the victim of less sever while 7 percent reported more sever domestic violence. Approximately, 31.3 percent women reported an act of emotional violence and 9.1 percent of women acknowledged about physical injuries (bruises or aches or broken bone etc.) as a consequence of domestic violence. In addition, 9.7 percent of women reported to have been hurt during pregnancy by husbands. Data showed that rural women are more prone to domestic violence i.e. 52.4 percent as compared to urban women (47.4 percent). Punjab indicated the maximum proportion of women,

[6] These risk classifications are measured by Rutstein and Rojas (2003)

experiencing domestic violence (28.9 percent) whereas Islamabad showed the minimum percentage of domestic violence (7 percent only). The pattern of experiencing physical violence by women fluctuates cyclically across the five wealth quintiles. The figures showed surprising outcomes by reporting the highest degree of domestic violence among richest quintile (22.9 percent) and lowest among poorest and middle quintiles (18.4 percent). Education of husband moves inversely to the domestic violence. Approximately, 55.7 percent of household reported domestic violence where husbands are uneducated and 12.4 percent where the husbands are highly educated. Similarly, women with no education have experienced maximum level of domestic violence (68.6 percent) which decreases initially with primary education (13.4 percent) but surprisingly seems increasing with middle education (31.3 percent) however, minimizes as education increases (23.9 percent). Likewise, disparities in age and education between husband and wife are slightly higher in households with domestic violence. Working women experience more violence (21.8 percent) than non-working women (19.1 percent). Similarly, woman who decides about own health care, reported (32.0 percent) of having experience physical violence in contrasted to those who do not experience violence i.e. 28.2 percent. The characteristics of child showed almost same results for mothers experiencing violence or without violence. Households having physical assets reported less incidences of violence as compared to those households without violence. Table 03 shows the descriptive statistics for mother and children's health inputs. Vaccinations against escapable diseases i.e. tuberculosis, measles, polio and tetanus are keys in supporting and encouraging children's good health. The statistics showed that children whose mothers undergo from domestic violence and children whose mothers, do not undergo from domestic violence, have a very little probability differences in using health inputs. For example, 45 percent of women (with violence) whereas, 47 percent women (without violence), take iron tablets throughout their pregnancy. Likewise, 97.05 percent of children are breastfed whose mothers are not gone through domestic violence while 97.01 percent children are breastfed whose mothers have not experienced domestic violence. Number of antenatal visits found more among women i.e. 3.63 percent (without violence) than 3.598 percent (with violence). In the same way, 74.2 percent women (with violence) got prenatal care with a trained health care professional whereas 75.4 percent (without violence) do not (figure02).

5.1.2 Measures of children's nutritional health outcomes

Three nutritional status indices are stated in Standard Deviation units from the Multicenter Growth Reference Study. Undernourishment among children increases the risk of poor health and fatal outcome that might ultimately leads to lower level of mental and intellectual development (figure03). Table 04 includes the descriptive statistics for children's nutritional outcomes with and without violence. Slight substantial variations are observed amongst the proportion of stunted children (households with violence) i.e. 40.8 percent and those without violence (38.4 percent). Similarly, the proportion of wasted and underweight children are 49.1 and 37.8 percent (with violence) and 44.8 and 34.6 percent (without violence), respectively.

Stunned children (Height-for-Age)

In Pakistan, approximately, 44.8 percent children (under 5 years of age) are found as stunted. Examination by different age cohorts proves that stunting rises with time, reaches at the highest of 52.8 percent among children age 24-35 months. Stunning is more common among male children i.e. 47.9 percent as compared to female children (41.7 percent). Nutritional status of mother is measured by calculating their Body Mass Index[7] (BMI), which influences the intensity of health outcomes of children. The statistics of weight and height measurements of women (aged 15-49) shows that 14 percent women are thin, 46 percent lie under normal category while 40 percent fall under overweight/obese class. Children born to mothers whose BMI <18.5, have the maximum intensities of stunting i.e. 55.4 percent, whereas those whose mother's BMI >25, have the minimum intensity of stunning i.e. 35.3 percent. Children, who live in rural areas, found more stunted i.e. 48.2 percent as compared to urban children i.e.37.1 percent. Children are found more likely to be stunted in Sindh (56.7 percent) in contrasted to those who are residing in Islamabad (22.2 percent). Opposite association is being examined between wealth quintiles and stunned children. Children belonging to the poorest quintile are approximately 3 times more prone to be stunted (61.6 percent) as compared to children belonging to the riches quintile (23 percent). In general, mother's education has an opposite relationship with stunted children; stunting range from 20.5 percent among children whose mothers are more educated as compared to those whose mother are uneducated (55.3 percent).

Wasted children (Weight-for-Height)

In Pakistan, 10.8 percent children are found to be wasted. Wasting is more common among younger children whose age is 6-8 months (20 percent) as compared to those who are running in between 48-59 months (4.8 percent) only. Wasting is more widespread among male children (11.7 percent) compared to (9.9 percent) of female children. Children whose mothers BMI < 18.5 are expected two times more wasted, compared to those whose mothers BMI >25 or more. Urban children are less probable to be wasted (9.9 percent) than rural children (11.2 percent). Wasting is found more among children, who live in Sindh (13.6 percent) and less among

[7] BMI is an index of weight-to-height which is usually applied to categorize underweight, overweight and obesity in adults. It is simply calculated by dividing the weight in kilograms to the square of the height in meters (kg/m^2).
BMI ≤ 17.0 shows moderate or severe thinness
BMI < 18.5 indicates underweight/thin
BMI 18.5-24.9 shows normal weight
BMI ≥ 25.0 alarms overweight/obese

children reside in Gilgit Baltistan (8 percent). In the richest wealth quintile, children are 2 times less likely to be wasted (8.2 percent) than in the poorest households (17.3 percent). The children of educated mothers are less prone to be wasted (6 percent), compared to those whose mothers are uneducated or less educated (14 percent).

Underweight children (Weight-for-Age)

In Pakistan, 30 percent of children are found to be under weighted. The percentage of underweight children is maximum (33.9 percent) among aged 9-11 and those 12-17 months. Again, more boy children are found to be underweight (32.8 percent), compared to girl children (27.1 percent). Children whose mothers BMI <18.5 are more likely to be underweight (44.2 percent), compared to those whose mother's BMI > 25 or more (18.5 percent). Children, who live in rural areas, are more probable to be underweight (32.5 percent), contrasted to urban children (24.1 percent). In Sindh, 42.3 percent children are underweight than 12.6 percent in Gilgit Baltistan. Children belonging to the lowest quintile are 3 folds more probable to be underweight (47.8 percent), compared to 15.6 percent children in the highest quintiles. Likewise, children whose mothers are not educated (38.7 percent) are approximately 4 folds probable to be underweight than to those whose mothers are highly educated (9.9 percent).

5.2 Quantitative Analysis

5.2.1 Determinants of mother's health inputs

Tables 05 and 06 present the main empirical outcomes. These outcomes indicated that number of antenatal visits mitigates the prevalence of domestic violence by 36.1 percent. In the same way, physical violence reduces the probability of a child being breastfed by 24.5 percent, after controlling the set of other characteristics. Due to the prevalence of physical violence, probability of receiving prenatal care by a trained professional and intake of iron tablets/syrups during pregnancy decreased 6.7 and 10.8 percent, respectively. The statistics revealed that any physical results from violence, remained insignificant for all health inputs, but not for iron tablets (though the probit coefficient found only significant at the 10 percent level). It reduced the probability of women's intake of iron tablets by 20.4 percent. The second kind of domestic violence i.e. emotional violence, negatively affected the health inputs but the coefficient values of antenatal visits, breastfeeding and prenatal care remained insignificant. However, results implied that woman who suffers from emotional distress demands less likely the intake of iron tablets during pregnancy (22 percent). It is observed, ceteris paribus, the characteristics of households (sex and age of the head) remained insignificant for all health inputs but not for its size. Family size is found to be a strong factor of antenatal visits. The coefficient values of household size suggested that women who live in bigger families are found 4.9, 4.8 and 4.7 percent, respectively less probable to utilize antenatal care than those who live in smaller households. While considering the outcomes of other characteristics of dwellings, rural women's visits for antenatal care are lesser (76.2, 75.6 and 74.8 percent), respectively than urban women, in all three specifications. Although, probability of rural women's intake of iron tablets and prenatal care during pregnancy decreases but its coefficients values remained statistically insignificant at all levels than urban counterparts. Rural women showed encouraging approach towards breastfeeding practice. The findings showed that probability of rural women's breastfeeding increases by 33.2, 32.9 and 32.0 percent, respectively, compared to urban women. Among regions, Sindh and Islamabad showed higher antenatal visits and the coefficient values are highly significant. Balochistan showed minimum antenatal care during pregnancy i.e. -0.731, -0.784 and -0.837 percent, respectively. Women, in Islamabad, take more iron tablets i.e. 46.2, 50.2 and 43.7 percent where Balochistani women take around 38.9, 37.7 and 40.1 percent less iron tablets than women in other geographic stratums. Women, in Islamabad, are also less likely to breastfeed their young ones by 67.8, 67.6 and 63.5 percent in contrasted to those who live in other regions. Women, in Balochistan, showed positive attitudes towards breastfeeding but the coefficient values remained insignificant in three specifications. Considering the prenatal care, again the women in Islamabad are highly concerned about their health checks up after delivery whereas the women in Balochistan are less likely to avail prenatal care by 57.1, 58.9 and 57.6 percent respectively. Wealth quintiles showed statistically significant coefficient values with all health inputs but not with breastfeeding which proved that women belonging to richer or the richest class are highly concerned with their health care before and after delivery, compared to poorer or the poorest households. Multiple facilities available at home, promote women's health care as its coefficient is statistically significant and increased antenatal visits by 24.4, 25.0 and 24.6 percent, respectively. Prenatal care increased with the availability of physical assets by 8.0 and 7.7 percent than those who do not have; while other three health inputs remained insignificants. The vital role of media in promoting women's health care by telecasting programs and publishing articles to raise awareness about reproductive health is always acknowledged. Media exposure showed positive associations with all four health inputs but its coefficient values found insignificant in case of antenatal visits and breastfeeding. The probability of women's iron tables increases by 7.9 and 8.1 percentage points of those who are in touch with media as compared to those who are lack of it. Similarly, media exposure helps women to be more concerned with their health care professionals. The probability of prenatal care increases by 18.3, 18.2 and 18.4 percent through media co-operation and revolution. While considering the characteristics of the child i.e. multiple births, although it increases women's health inputs but its coefficient values found insignificant in antenatal visits and prenatal care regressions. The variable is also dropped in case of breastfeeding because it predicted success perfectly. The probability of iron's intake found increasing if the woman is pregnant with more than one child (65.8, 63.7 and 66.0 percent) than those who are pregnant

with single fetus. The sex of child did not influence by women's health inputs including prenatal care, breastfeeding and iron tablet's intake. The coefficient value found negative and statistically significant (at 10 percent) in case of antenatal visits which showed that male child reduced women's health input by 30.7, 30.6 and 31.5 percent, respectively. The associations between age of child and antenatal visits found insignificant at the same time women's intake of iron tablets and prenatal care undergone inversely with child's age. Women cut iron ingestion and prenatal care by 7.0 percent 4.70 percent, respectively as child grew old. On contrary, probability of child being breastfed increased by 16.0 percent as he grew. Child lives with mother or elsewhere did not influence by any health inputs and remained statistically insignificant in all estimations. Age always acts as a substitute in awareness build-up that enlightened women decisions making power regarding health care. The findings showed that women belonging to lower age cohort found at higher risk of availing less antenatal visits and prenatal care than older aged group, although, the coefficient found statistically insignificant. However, the relationship between women's older age and antenatal visits found inconsistent. Women, in higher age group (more than 35) are at a higher risk of taking less iron tablets and breastfeeding but the coefficient remained statistically insignificant. In the multivariable analyses, the older women showed less likely to go for prenatal care by 24.1, 23.9 and 23.6 percent, respectively. Women's education is found directly link to the increased use of all health inputs. Educated women go for antenatal visit 5.1 times more than uneducated women. Similarly, the probability of iron tablets and prenatal care increased by 29.5 and 17.9 percent, respectively with increased level of education. Working women showed less interest to go for antenatal visit, breastfeeding and prenatal care but take iron tablets approximately 8.0 percent more than non-working women. The likelihood of employed women to go for prenatal care is 17.9,18,3 and 16.8 percent, respectively less than the non-working women Women's decisions making showed positive association with all health inputs but its coefficient found statistically significant in case of antenatal visits and prenatal care. The probability of women's prenatal care increased by nearly 43 to 42 percent antenatal visits and prenatal cares, respectively, in all three estimations. Pregnancy risk found statistically significant and inversely related to all health inputs. By demanding more health inputs, women might reduce the risk of still-births and pregnancy complications which give women a productive pregnancy experience or complication free pregnancy. Frequent antenatal visits of pregnant women are effective and helps in reducing pregnancy risk by 9.3 and 9.4 percent; respectively. The probability of iron tablets reduced the pregnancy risks by 2.4, 2.3 and 2.5 percent, respectively. World Health Organization (WHO) suggested that pregnant females should take iron supplement on daily basis for decreasing the risk of iron deficiency that causes anemia and low birth weight. Prenatal care is proposed to alleviate the complications of preeclampsia, and later to reduce risks of underweight children, premature delivery as well as associated morbidity or mortality. The findings showed that receiving prenatal care in advance lessens the pregnancy risk by 2.6 percent. No significant association between any health input and age difference of husband and wife is found whereas, educational difference between partners showed significant relationship with iron tablets only. Table 07 presents the marginal effects of women's health inputs. Marginal effects (at the mean) and average marginal effects of mother's health inputs and domestic violence against married women are almost identical. A negative marginal change in mother's health inputs and domestic violence is being observed. Table 08a and Table08b present the tabularization and the mean values of estimated predicted probabilities of mother's health inputs. Average values of estimated predicted probabilities are 46.3, 97.05 and 74.5 percent for iron tablets, breastfeeding and prenatal care, respectively which are identical to actual frequencies. Table08c shows the outcomes of percent correctly predicted values and the study used estat classifications for measuring true and false predictions. As the predicted probability is > 0.5 so, it could be easily predicted that all mother's health inputs are equivalent to one. The specified values are 69.57, 97.86 and 79.89 percent for iron tablets, breastfeeding and prenatal care, respectively that showed overall satisfaction about the proposed models.

5.2.2 Determinants of children's nutritional health outcomes

Child's nutritional outcomes are reported in Table 09. Domestic violence showed no direct significant effect on the probability of stunted or wasted children but to a very small extent on underweight. Children whose mothers received iron tablets during pregnancy are 14.2 and 3 percent less prone to be stunted, wasted and underweight, respectively. Likewise, more antenatal visits reduced the short term (wasted) and long term (stunning) nutritional outcomes. Vaccination is a foundation of child's health intrusion to decrease the morbidity and mortality. Vaccination against certain diseases reduced the stunning, waste and underweight children by 8.5, 7.7 and 8.4 percent, respectively. Among regions, it is observed that stunned, wasted and underweight children are highest in Balochistan and lowest in Islamabad. Exposure to media helped in lessening the probability of stunned, wasted and underweight children by 12, 13 and 16 percent, respectively. In general, mother's education is accounted as a protecting shield against child's under nutrition (Chirande, et al. 2015; WHO, 2011). The probability of stunting, wasted and underweight children decreased with women's education by 17, 20 and 21 percent, respectively. The findings showed that low pervasiveness of stunting, wasting and underweight is observed between children of working mothers. Mother's employment increases the economic gain that leads to have encouraging impact on children's nutritional intake. On the other hand, children born to non-working mothers may have had insufficient access to high quality nutrition as they might lack the economic resources to obtain ample food for the children (Ergin,et al. 2007). Table 10 presents the marginal

effects of mother's health inputs in addition to nutritional health outcomes of children. The marginal and average effects of mother's health inputs, child's health outcomes and domestic violence against women are more or less the same. Negative marginal change in mother's health inputs and children nutritional health outcomes is found. It is clearly observed that mothers who are not fully concerned with health care throughout pregnancies, their children suffer from short term and long term malnutrition in their early lives which on turn badly influence their ongoing physical activities in development process. Table11a and Table11b present the tabularization and the mean values of estimated predicted probabilities of child's health outcomes. Average values of estimated predicted probabilities are 38.9, 45.9 and 35.4 percent for stunting, wasted and underweight, respectively, found identical to actual frequencies. Table11c shows the correctly predicted values and as the predicted probability is greater than 0.5 thus it could be anticipated that all child's health outcomes are equivalent to one. The specified values (correctly) are 67.22, 66.74 and 71.79 percent for stunting, wasted and underweight, respectively that is on average, presents satisfactory predictions of the models.

VI. CONCLUSION AND POLICY IMPLICATIONS

Results confirmed the proposed hypotheses that domestic violence is considerably detrimental to the victim women and their children's growth. Particularly, it is established the fact that domestic violence significantly decreases the probability of breastfeeding, vaccinations against certain diseases, iron intake and appropriate prenatal care throughout pregnancy. Furthermore, the main contributing factors, determining the quality utilization of antenatal care, iron intake and prenatal health care are richest wealth quintile, urban regions, availability of multiple facilities at household, women's better education and decisions making power. The outcomes showed that high pregnancy risk, rural accommodations and prevailing orthodoxy society in the most deprived region (Balochistan) causes obstruction to potential antenatal and prenatal care, breastfeeding practices and iron intake. The incidences of domestic violence and its consequences for sufferers and perpetrators call the consideration of the media, researchers, associations, community and officially authorized agencies for combating this lawless phenomenon through proper strategy and campaign. On the basis ofempirical results, the study proposes auxiliary efforts are needed to condense high prevalence of domestic violence and its afterwards detrimental impacts on maternal and child's health. Initiatives and programs are required on urgent basis to progress women's empowerment, through easy access to education and economic opportunities that may not only counteract the risk of domestic violence, but also improve the long term growth of many children in Pakistan.

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Table 01 Description list of independent variables (socio-economic determinants) of ever married women (aged 15-49).

Variables	Type
Demographics Characteristics of Household	
Household size	Continuous
Age of the head of household	Continuous
Head of household is male	Dichotomous
Other Characteristics of the Dwellings	
Place of Residence	
Rural	Dichotomous
Urban (Reference Category)	Dichotomous
Regions/Province	
Sindh	Dichotomous
Punjab	Dichotomous
Khyber-Pakhtunkhwa	Dichotomous
Balochistan	Dichotomous
Islamabad	Dichotomous
Gilgit Baltistan (Reference Category)	Dichotomous
Wealth Quintiles	
Poorest quintile	Continuous
Poorer quintile	Continuous
Middle quintile	Continuous
Richer quintile	Continuous
Richest quintile	Continuous
Other Characteristics of the dwelling	
Floor material	Dichotomous
Has flushing toilet	Dichotomous
Water piped into household, yard or building	Dichotomous
Has electricity	Dichotomous
Physical Assets	Dichotomous
Media Exposure	Dichotomous
Characteristics of the child	
Child is from multiple birth	Dichotomous
Child is male	Dichotomous
Age in months	Continuous
Child lives elsewhere	Dichotomous
Women's Status (other indicators)	
Age of women<18	Dichotomous
Age of women>35	Dichotomous
Educational attainment	
No education (Reference Category)	Dichotomous
Primary	Dichotomous
Secondary	Dichotomous
Higher	Dichotomous
Employment status	

Working	Dichotomous
Non-working (Reference Category)	Dichotomous
Woman decides about her own health care (Weighted Index)	Continuous
Pregnancy Risk	Dichotomous
Gender Differences	
Education difference between husband and wife (years)	Continuous
Age difference between husband and wife (years)	Continuous
Mother's Height/Age	Continuous
Mother's Weight/Height	Continuous

Source: Author's compilation of Pakistan Demographic and Health Survey (2012-13)'s data

Table 02 Descriptive statistics of socio-economic and demographic characteristics of households with and without domestic violence

Variables	All sample		Households (HH) with DV		Households (HH) without DV		Mean Difference: HH with DV and HH without DV
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Domestic Violence (DV)							
Physical violence	0.280	0.450	0.280	0.450	---	---	---
Physical violence less sever	0.280	0.450	0.280	0.450	---	---	---
Physical violence more sever	0.070	0.254	0.070	0.254	---	---	---
Emotional violence	0.313	0.463	0.313	0.463	---	---	---
Any physical results from violence	0.091	0.288	0.091	0.288	---	---	---
Women hurt during pregnancy by husband	0.097	0.296	0.097	0.296	---	---	---
Demographics and other Characteristics of Household							
Household size	8.810	5.039	7.520	3.848	9.31	5.351	1.790
Age of the head of household	46.77	13.438	45.400	13.072	47.310	13.542	1.910
Head of household is male	0.915	0.278	0.902	0.298	0.921	0.271	0.019
Place of Residence							
Rural	0.531	0.499	0.524	0.499	0.534	0.498	0.010
Urban	0.468	0.499	0.475	0.499	0.465	0.498	-0.010
Region							
Punjab	0.280	0.449	0.289	0.453	0.276	0.447	-0.013
Sindh	0.216	0.412	0.223	0.416	0.214	0.410	-0.009
Khyber-Pakhtunkhwa	0.198	0.399	0.187	0.390	0.203	0.402	0.016
Balochistan	0.144	0.351	0.136	0.343	0.146	0.354	0.010
Gilgit Baltistan	0.089	0.285	0.090	0.287	0.089	0.285	-0.001
Islamabad	0.070	0.255	0.072	0.258	0.069	0.254	-0.003
Wealth Status							
Poorest quintile	0.183	0.386	0.184	0.388	0.182	0.386	-0.002
Poorer quintile	0.190	0.392	0.192	0.394	0.189	0.392	-0.003
Middle quintile	0.191	0.393	0.184	0.388	0.193	0.395	0.009
Richer quintile	0.196	0.396	0.208	0.406	0.191	0.393	-0.017
Richest quintile	0.239	0.426	0.229	0.420	0.242	0.428	0.013

Husband's Level of Education							
No education	0.686	0.463	0.557	0.497	0.564	0.496	0.007
Primary	0.134	0.341	0.142	0.349	0.132	0.339	-0.010
Secondary	0.317	0.465	0.177	0.381	0.179	0.383	0.002
Higher	0.234	0.423	0.124	0.330	0.125	0.330	0.001
Characteristics of the Child							
Child is from multiple birth	0.013	0.113	0.013	0.113	0.013	0.113	0.000
Child is male	0.532	0.499	0.537	0.498	0.529	0.499	-0.008
Age of child (in months)	23.15	16.123	23.82	16.132	20.77	15.88	-3.050
Child lives elsewhere	0.013	0.115	0.014	0.120	0.013	0.113	-0.001
Women's Status (other indicators)							
Woman is working	0.198	0.399	0.218	0.413	0.191	0.393	-0.027
Woman's Level of Education							
No education	0.562	0.496	0.686	0.464	0.687	0.464	0.001
Primary	0.135	0.341	0.134	0.341	0.135	0.341	0.001
Secondary	0.178	0.382	0.313	0.464	0.320	0.466	0.007
Higher	0.124	0.330	0.239	0.426	0.233	0.423	-0.006
Woman decides about her own health care	0.292	0.336	0.320	0.343	0.282	0.333	-0.038
Gender Differences							
Educational difference between husband and woman	0.624	1.123	0.622	1.127	0.625	1.121	0.003
Age difference between husband and woman	5.414	5.396	5.499	5.400	5.380	5.394	-0.119
Characteristics of the Dwelling							
Flooring material: Finished type (e.g. marble, parquet, ceramic tiles, bricks)	0.853	0.354	0.304	0.460	0.276	0.447	-0.028
Flushing toilet (Improved, not shared by 2-3 HH)	0.284	0.451	0.855	0.352	0.852	0.355	-0.003
Water piped into household/building (source of water)	0.413	0.492	0.432	0.495	0.406	0.491	-0.026
Household has electricity	1.170	1.145	1.07	0.870	1.170	1.145	0.100
Other income and assets							
Household has radio	0.43	1.32	0.31	1.021	0.43	1.324	0.12
Household has television	0.87	1.27	0.76	1.004	0.87	1.272	0.11
Household has refrigerator	0.73	1.30	0.61	1.033	0.73	1.307	0.12
Household has bicycle	0.53	1.32	0.39	1.032	0.53	1.326	0.14
Household has motorcycle	0.60	1.32	0.47	1.038	0.60	1.322	0.13
Household has car/truck	0.37	1.32	0.24	1.006	0.37	1.32	0.13
Total Observations	**13558**		**3808**		**9750**		

Source: *Pakistan Demographic and Health Survey (2012-13)*

Table 03 Descriptive statistics of selected health inputs of children and ever married women (aged 15-49) households with and without violence

Variable	All sample		Households with DV		Households without DV		Mean Difference: HH with DV and without DV
Health Inputs	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	
Child was breastfed	0.971	0.170	0.9701	0.170	0.9705	0.171	-0.001
Child ever received vaccination	0.835	0.372	0.827	0.379	0.851	0.355	-0.024
Child received all vaccinations[8]	2.482	1.509	2.449	1.518	2.565	1.482	-0.116
Mother received iron tablets/syrup during pregnancy	0.463	0.499	0.459	0.498	0.470	0.499	-0.011
Number of antenatal visits during pregnancy	3.56	5.472	3.598	5.631	3.63	5.052	-0.100
Delivery in Govt: or Pvt. hospital or MCH[9] or RCH[10]	0.532	0.500	0.527	0.499	0.540	0.498	-0.013
Prenatal care with a trained health professional	0.745	0.435	0.742	0.437	0.754	0.430	-0.012
Total Observations	**4939**		**1423**		**3516**		

Source: Author's compilation of Pakistan Demographic and Health Survey (2012-13)'s data

Table 04 Descriptive statistics of selected children's nutritional health outcomes with and without violence in Pakistan

Variables	All sample		Households with DV		Households without DV		Mean Difference: HH with DV and without DV	
Health Outcomes	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.		
Proportion of stunted children	0.389	0.487	0.408	0.491	0.384	0.486	0.024	…
Proportion of wasted children	0.458	0.498	0.491	0.500	0.448	0.497	0.043	…
Proportion of underweight children	0.353	0.478	0.378	0.485	0.346	0.475	0.032	…
Total Observations	**2560**		**1994**		**566**			

Notes: The descriptive statistics show the children less than 4 years of age whose mothers were selected for domestic violence module

[8] All vaccinations include BCG, DPT (3), Polio (3) and Measles
[9] Mother Child Health Centre
[10] Rural Health Centre

Table 05 Determinant of mother's health input (Antenatal Visits and Iron Tablets) and domestic violence against ever-married women aged (15-49)

Dependent Variable: Women's Health Inputs	Specification I	Specification II	Specification III	Specification I	Specification II	Specification III
Explanatory Variables	OLS Antenatal Visits	OLS Antenatal Visits	OLS Antenatal Visits	Probit Iron Tablets	Probit Iron Tablets	Probit Iron Tablets
Domestic Violence (DV)						
Physical violence	-0.361 (-1.730)**	---	---	-0.108 (-1.340)	---	---
Emotional violence	---	-0.193 (-0.960)	---	---	-0.220 (-2.870)***	---
Any physical results from violence	---	----	-0.084 (-0.26)	---	---	-0.204 (-1.630)*
Women hurt during pregnancy by husband	-0.021 (-0.070)	-0.141 (-0.480)	-0.291 (-0.95)	-0.138 (-1.180)	-0.081 (-0.710)	-0.122 (-1.040)
Demographics Characteristics of Household						
Household size	-0.049 (-2.010)***	-0.048 (-1.970)**	-0.047 (-1.92)*	-0.001 (-0.100)	-0.001 (-0.110)	-0.001 (-0.080)
Age head of household (years)	0.001 (0.160)	0.001 (0.150)	0.001 (0.16)	-0.001 (-0.250)	-0.001 (-0.300)	-0.001 (-0.210)
Head of household is male	-0.079 (-0.250)	-0.095 (-0.310)	-0.091 (-0.29)	0.034 (0.290)	0.025 (0.220)	0.031 (0.260)
Other Characteristics of the Dwellings						
Place of Residence						
Rural/Urban	-0.762 (-3.610)***	-0.756 (-3.580)***	-0.748 (-3.54)***	-0.077 (-0.970)	-0.074 (-0.920)	-0.073 (-0.910)
Regions/Province						
Punjab	0.114 (0.330)	0.109 (0.310)	0.065 (0.19)	0.171 (1.350)	0.162 (1.290)	0.158 (1.260)
Sindh	1.317 (4.05)***	1.279 (3.830)***	1.276 (3.82)***	0.101 (0.780)	0.132 (1.010)	0.092 (0.710)
Khyber-Pakhtunkhwa	-0.481 (-1.350)	-0.543 (-1.540)	-0.613 (-1.74)*	0.518 (3.860)***	0.547 (4.090)***	0.508 (3.820)***
Balochistan	-0.731 (-2.000)**	-0.784 (-2.160)***	-0.837 (-2.31)***	-0.389 (-2.730)***	-0.377 (-2.650)***	-0.401 (-2.820)***
Islamabad	1.557	1.528	1.463	0.462	0.502	0.437

	(3.450)***	(3.370)***	(3.25)***	(2.650)***	(2.870)***	(2.520)***
Wealth Quintiles	0.689	0.690	0.702	0.107	0.103	0.110
	(6.240)***	(6.240)***	(6.35)***	(2.580)***	(2.470)***	(2.630)***
Facilities at home	0.244	0.250	0.246	-0.004	-0.001	-0.002
	(2.370)***	(2.420)**	(2.38)**	(-0.100)	(-0.040)	(-0.060)
Physical Assets	-0.093	-0.095	-0.094	0.033	0.034	0.032
	(-1.040)	(-1.050)	(-1.05)	(0.960)	(0.980)	(0.930)
Media Exposure	0.151	0.150	0.148	0.079	0.081	0.079
	(1.280)	(1.270)	(1.26)	(1.780)*	(1.830)*	(1.770)*
Characteristics of the Child						
Child is from multiple birth	0.533	0.550	0.588	0.658	0.637	0.660
	(0.680)	(0.700)	(0.75)	(2.080) **	(2.010)**	(2.090)**
Child is male	-0.307	-0.306	-0.315	-0.073	-0.068	-0.074
	(-1.870)*	(-1.870)*	(-1.92)*	(-1.170)	(-1.090)	(-1.190)
Age of child in months	0.056	0.054	0.0568	-0.070	-0.070	-0.070
	(0.860)	(0.830)	(0.87)	(-2.820)***	(-2.820)***	(-2.790)***
Child lives elsewhere	-0.019	-0.061	-0.120	-0.168	-0.143	-0.205
	(-0.010)	(-0.040)	(-0.08)	(-0.300)	(-0.250)	(-0.360)
Women's Status (other indicators)						
Age of women<18	-0.513	-0.527	-0.555	0.077	0.089	0.109
	(-0.430)	(-0.440)	(-0.460)	(0.160)	(0.190)	(0.230)
Age of women>35	0.079	0.087	0.077	-0.030	-0.028	-0.028
	(0.360)	(0.390)	(0.35)	(-0.350)	(0.340)	(-0.330)
Educational attainment	0.630	0.641	0.639	0.295	0.296	0.295
	(5.060)***	(5.160)***	(5.14)***	(6.310)***	(6.330)***	(6.310)***
Working Status	-0.309	-0.319	-0.319	0.079	0.079	0.081
	(-1.410)	(-1.450)	(-1.45)	(0.940)	(0.940)	(0.960)
Women takes decisions about own health care	0.433	0.430	0.39	0.054	0.056	0.052
	(1.660)*	(1.670)*	(1.650)*	(0.53)	(0.54)	(0.52)
Pregnancy Risk	-0.093	-0.093	-0.094	-0.024	-0.023	-0.025
	(-3.650)***	(-3.640)***	(-3.69)***	(-2.500)***	(-2.390)***	(-2.530)***
Gender Differences						
Age difference between husband and wife (years)	0.010	0.011	0.009	0.005	0.006	0.005
	(0.620)	(0.650)	(0.57)	(0.870)	(0.940)	(0.850)
Education difference between husband and wife (years)	0.122	0.124	0.128	0.095	0.092	0.094
	(1.380)	(1.400)	(1.44)	(2.830)**	(2.750)**	(2.810)**
Constant	1.089	1.074	1.0200	-0.860	-0.832	-0.875
	(1.890)**	(1.860)**	(1.77)*	(-3.930)***	(-3.800)***	(-4.010)***
R- squared	**0.3021**	**0.300**	**0.300**	---	---	---

F- statistic	**30.86**	**30.75**	**30.67**	**---**	**---**	**---**
Observations	**1889**	**1887**	**1887**	**1889**	**1889**	**1887**

Specification I uses a dummy for physical violence as an indicator of domestic violence
Specification II uses a dummy for emotional violence as an indicator of domestic violence
Specification III on the other hand, uses the indicators for whether the mother has undergone from any physical results as a consequences of violence.
*Note: Figures in parenthesis are absolute values of t and z statistics, * significant at 10 percent, ** at 5 percent and *** at 1 percent level.*

Table 06 Determinants of women's health inputs (Breastfeeding and Prenatal Care) and domestic violence against ever-married women (aged 15-49).

Dependent Variables: Women's Health Inputs	Specification I	Specification II	Specification III	Specification I	Specification II	Specification III
Explanatory Variables	Probit Breastfeeding	Probit Breastfeeding	Probit Breastfeeding	Probit Prenatal Care	Probit Prenatal Care	Probit Prenatal Care
Domestic Violence (DV)						
Physical violence	-0.245 (-1.490)	---	---	-0.067 (-0.730)	---	---
Emotional violence	---	-0.135 (-0.940)	---	---	-0.003 (-0.040)	---
Any physical results from violence	---	---	-0.400 (-1.430)	---	---	-0.159 (-1.220)
Women hurt during pregnancy by husband	-0.123 (-0.540)	-0.030 (-0.140)	-0.106 (-0.480)	-0.094 (-0.750)	-0.051 (-0.410)	-0.124 (-0.980)
Demographics Characteristics of Household						
Household size	0.024 (1.200)	0.024 (1.180)	0.024 (1.190)	-0.008 (-0.750)	-0.008 (-0.730)	-0.008 (-0.790)
Age head of household (years)	0.002 (0.340)	0.002 (0.340)	0.001 (0.765)	0.001 (0.430)	0.001 (0.430)	0.001 (0.400)
Head of household is male	0.095 (0.480)	0.111 (0.570)	0.112 (0.570)	-0.031 (-0.230)	-0.034 (-0.250)	-0.030 (-0.230)
Other Characteristics of the Dwellings						
Place of Residence						
Rural/Urban	0.332 (2.240)**	0.329 (2.240)**	0.320 (2.170)**	-0.108 (-1.140)	-0.106 (-1.120)	-0.101 (-1.070)
Regions/Province						
Sindh	-0.182 (-0.710)	-0.167 (-0.650)	-0.163 (-0.630)	0.181 (1.260)	0.174 (1.210)	0.163 (1.130)

Punjab	-0.335 (-1.290)	-0.347 (-1.330)	-0.323 (-1.240)	-0.089 (-0.600)	-0.098 (-0.660)	-0.096 (-0.660)
Khyber-Pakhtunkhwa	-0.483 (-1.850)*	-0.458 (-1.750)*	-0.459 (-1.770)*	-0.328 (-2.220)**	-0.352 (-2.400)**	-0.333 (-2.280)**
Balochistan	0.261 (0.750)	0.263 (0.760)	0.266 (0.770)	-0.571 (-3.870)***	-0.589 (-4.020)***	-0.576 (-3.930)***
Islamabad	-0.678 (-2.270)**	-0.676 (-2.250)**	-0.635 (-2.140)**	0.838 (2.540)***	0.818 (2.480)***	0.808 (2.460)***
Wealth Quintiles	0.035 (0.450)	0.039 (0.500)	0.034 (0.440)	0.239 (4.930)***	0.241 (4.960)***	0.244 (5.020)***
Facilities at home	0.018 (0.250)	0.014 (0.200)	0.010 (0.140)	0.050 (1.000)	0.050 (1.010)	0.051 (1.020)
Physical Assets	-0.010 (-0.160)	-0.012 (-0.180)	-0.005 (-0.080)	0.080 (1.960)**	0.080 (1.950)**	0.077 (1.890)**
Media Exposure	0.084 (0.990)	0.083 (0.980)	0.087 (1.030)*	0.183 (3.400)***	0.182 (3.390)***	0.184 (3.410)***
Characteristics of the Child						
Child is from multiple birth	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)	0.504 (1.070)	0.515 (1.090)	0.501 (1.060)
Child is male	0.023 (0.200)	0.020 (0.170)	0.021 (0.180)	-0.048 (-0.670)	-0.050 (-0.680)	-0.055 (-0.760)
Age of child in months	0.160 (4.920)***	0.161 (4.920)***	0.160 (4.900)***	-0.046 (-1.620)*	-0.047 (-1.63)*	-0.047 (-1.63)*
Child lives elsewhere	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)
Women's Status (other indicators)						
Age of women<18	0.000 (omitted)	0.000 (omitted)	0.000 (omitted)	-0.366 (-0.800)	-0.376 (-0.820)	-0.345 (-0.750)
Age of women>35	-0.179 (-1.150)	-0.180 (-1.160)	-0.186 (-1.190)	-0.241 (-2.600)***	-0.239 (-2.590)***	-0.236 (-2.550)***
Educational attainment	0.061 (0.710)	0.071 (0.830)	0.071 (0.830)	0.177 (2.290)***	0.179 (2.970)***	0.174 (2.880)***
Woman decides about her own health care	0.184 (1.00)	0.189 (1.02)	0.202 (1.08)	0.422 (1.64)*	0.424 (1.63)*	0.421 (1.62)*
Working Status	-0.013 (-0.090)	-0.005 (-0.030)	-0.011 (-0.070)	-0.179 (-1.890)**	-0.183 (-1.940)**	-0.168 (-1.780)*
Pregnancy Risk	0.011 (0.630)	0.011 (0.630)	0.012 (0.700)	-0.026 (-2.020)**	-0.026 (-2.030)**	-0.026 (-2.040)**
Gender Differences						

Age difference between husband and wife (years)	-0.011 (-1.050)	-0.011 (-1.060)	-0.011 (-1.050)	0.002 (0.250)	0.002 (0.250)	0.003 (0.370)
Education difference between husband and wife (years)	-0.019 (-0.290)	-0.022 (-0.350)	-0.022 (-0.340)	0.001 (0.020)	0.002 (0.050)	0.002 (0.060)
Constant	1.316 (3.300)***	1.328 (3.330)***	1.352 (3.410)***	-0.124 (-0.490)	-0.134 (-0.520)	-0.131 (-0.510)
Observations	**2902**	**2901**	**2899**	**1883**	**1883**	**1881**

*Note: Figures in parenthesis are absolute values of z statistics, * significant at 10 percent, ** at 5 percent and *** at 1 percent level.*

Table 07 Marginal effects (at the mean and average marginal effect) margins, dydx (*) at means of mother's health inputs and domestic violence against ever-married women aged (15-49)

Dependent Variables: Women's Health Inputs	**Antenatal visits**		**Iron Tablets**		**Breastfeeding**		**Prenatal care**	
Explanatory Variables	Marginal effects at the mean	Average marginal effects	Marginal effects at the mean	Average marginal effects	Marginal effects at the mean	Average marginal effects	Marginal effects at the mean	Average marginal effects
Domestic Violence (DV)								
Physical violence	-0.372	-0.372	-0.014	-0.011	-0.004	-0.008	-0.013	-0.013
Emotional violence	-0.071	-0.071	-0.086	-0.072	-0.001	-0.001	-0.014	-0.013
Any physical results from violence	-0.099	-0.099	-0.054	-0.045	0.007	0.015	-0.038	-0.037
Women hurt during pregnancy by husband	-0.287	-0.287	-0.019	-0.016	-0.005	-0.010	-0.030	-0.029
Demographics Characteristics of Household								
Household size	-0.049**	-0.049**	0.000	0.000	0.001	0.001	-0.002	-0.002
Age head of household (years)	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Head of household is male	-0.078	-0.078	0.010	0.008	0.002	0.005	-0.007	-0.007
Other Characteristics of the Dwellings								
Place of Residence								
Rural/Urban	-0.753***	-0.753***	-0.028	-0.023	0.007***	0.015***	-0.026	-0.025
Regions/Province								
Sindh	1.316***	1.316***	0.050	0.052	-0.004	-0.008	0.042	0.040
Punjab	0.119	0.119	0.052	0.043	-0.007	-0.016	-0.024	-0.023

Khyber-Pakhtunkhwa	-0.500	-0.500	0.054***	0.182***	-0.011*	-0.023*	-0.081***	-0.078***
Balochistan	-0.750***	-0.750***	-0.057***	-0.125***	0.005	0.011	-0.140***	-0.135***
Islamabad	1.565***	1.565***	0.070***	0.162***	-0.015***	-0.031***	0.199***	0.191***
Wealth Quintile	0.695***	0.695***	0.017***	0.035***	0.001	0.002	0.060***	0.058***
Facilities at home	0.242***	0.242***	-0.016	-0.000	0.000	0.001	0.012	0.012
Physical Assets	-0.093	-0.093	0.014	0.011	-0.000	-0.000	0.019*	0.018*
Media Exposure	0.151	0.151	0.018*	0.027*	0.002	0.004	0.045***	0.043***
Characteristics of the Child								
Child is from multiple birth	0.537	0.537	0.252***	0.209***	0.000	0.000	0.123	0.119
Child is male	-0.309*	-0.309*	-0.028	-0.023	-0.007	0.001	-0.014	-0.013
Age of child in months	0.060	0.060	-0.028***	-0.023***	0.011***	0.007***	-0.011	-0.010
Child lives elsewhere	-0.001	-0.001	-0.064	-0.053	0.000	0.000	0.000	0.000
Women's Status (other indicators)								
Age of women<18	-0.558	-0.558	0.046	0.038	0.000	0.000	-0.085	-0.081
Age of women>35	0.064	0.064	-0.012	-0.010	-0.004	-0.008	-0.058***	-0.056***
Educational attainment	0.627***	0.627***	0.117***	0.097***	0.001	0.003	0.043***	0.041***
Working Status	-0.305	-0.305	0.033	0.028	-0.000	-0.001	-0.041*	-0.040*
Women takes decisions about own health care	0.451*	0.451*	0.024	0.020	0.004	0.009	0.026	0.025
Pregnancy Risk	-0.092***	-0.092***	-0.023***	-0.020***	0.000	0.001	-0.006***	-0.006***
Gender Differences								
Age difference between husband and wife (years)	0.009	0.009	0.002	0.002	-0.000	-0.001	0.001	0.001
Education difference between husband and wife (years)	0.124	0.124	0.036***	0.030***	-0.000	-0.001	0.001	0.001
Number of observations	**1887**		**1889**		**2898**		**1881**	

*Note: *, **, *** are the absolute values of z statistics, significant at 10, 5 and 1 percent level, respectively.*

Table 08a Tabularization of mother's health inputs

Tabulate	**Iron Tablets**			**Breastfeeding**			**Prenatal Care**		
	No	Yes	Total	No	Yes	Total	No	Yes	Total
Frequency	4,007	3,447	7,454	400	13,158	13,558	1,900	5,552	7,452
Percent	53.76	46.24	100.00	2.95	97.05	100.00	25.50	74.50	100.00
Cumulative	53.76	100.00		2.95	100.00		25.50	100.00	

Table 08b Estimated predicted probabilities of mother's health inputs

Variables	**Obs.**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Iron tablets	7454	0.463	0.499	0	1
pprobit	2898	0.979	0.026	0.753	1
Breastfeeding	13558	0.971	0.170	0	1
pprobit	2898	0.979	0.026	0.73	1
Prenatal care	7452	0.745	0.435	0	1
pprobit	2978	0.409	0.233	0.003	0.962

Table 08c Percent correctly predicted values of probit model for mother's health inputs (estat classification)

Iron tablets				**Breastfeeding**				**Prenatal care**			
-------- True --------				-------- True --------				-------- True --------			
Classified	D	~D	Total	Classified	D	~D	Total	Classified	D	~D	Total
+	562	247	809	+	2835	62	2897	+	1327	277	1604
-	327	750	1077	-	0	0	0	-	101	175	276
Total	899	997	1886	Total	2835	62	2897	Total	1428	452	1880

Classified + if predicted Pr(D) >= 0.5
True D defined as Iron tablets, Breastfeeding and Prenatal care!=0

		Iron tablets **(%)**	Breastfeeding **(%)**	Prenatal care **(%)**
Sensitivity	Pr(+ | D)	63.22	100.00	93.93
Specificity	Pr(-| ~D)	75.23	00.00	38.72
Positive predictive value	Pr(D + |)	69.74	97.86	82.73
Negative predictive value	Pr(~D - |)	69.94	00.00	63.41
False + rate for true ~D	Pr(+| ~D)	24.77	100.00	61.28
False - rate for true D	Pr(- | D)	36.78	00.00	7.07
False + rate for classified +	Pr(~D | +)	30.53	2.14	17.27
False - rate for classified –	Pr(D - |)	30.36	00.00	36.59
Correctly Classified		**69.57**	**97.86**	**79.89**

Table 09 Determinants of children's nutrition health output: Stunted, Wasted and Underweight, health inputs and domestic violence against ever-married women (aged 15-49).

Dependent Variables: Children's health outcomes	Specification I	Specification II	Specification III	Specification I	Specification II	Specification III	Specification I	Specification II	Specification III
Explanatory Variables	Probit Stunted	Probit Stunted	Probit Stunted	Probit Wasted	Probit Wasted	Probit Wasted	Probit Underweight	Probit Underweight	Probit Underweight
Mother's Health Inputs									
Antenatal Visits	-0.012 (-1.350)	-0.012 (-1.390)	-0.013 (-1.460)	-0.019 (-2.210)***	-0.019 (-2.240)***	-0.019 (-2.270)***	-0.015 (-1.700)*	-0.015 (-1.730)*	0.016 (-1.830)*
Iron tablets	-0.142 (-1.980)**	-0.145 (-2.020)**	-0.141 (-1.960)**	-0.030 (-0.420)	-0.031 (-0.440)	-0.031 (-0.430)	-0.031 (-0.420)	-0.029 (-0.390)	-0.025 (-0.330)
Breastfeeding	-0.246 (-1.460)	-0.256 (-1.510)	-0.240 (-1.420)	-0.094 (-0.540)	-0.090 (-0.520)	-0.091 (-0.530)	-0.087 (-0.500)	-0.093 (-0.530)	-0.076 (-0.430)
Prenatal care	-0.021 (-0.230)	-0.022 (-0.240)	-0.019 (-0.210)	-0.006 (-0.070)	-0.006 (-0.070)	-0.011 (-0.120)	-0.040 (-0.440)	-0.039 (-0.430)	-0.050 (-0.540)
All Vaccinations	-0.085 (-3.500)***	-0.085 (-3.500)***	-0.087 (-3.590)***	-0.076 (-3.130)***	-0.077 (-3.160)***	-0.077 (-3.180)***	-0.084 (-3.370)***	-0.084 (-3.400)***	-0.088 (-3.520)***
Domestic Violence (DV)									
Physical violence	0.104 (1.280)	---	---	0.109 (1.350)	---	---	0.150 (1.790)*	---	---
Emotional violence	---	0.032 (0.420)	---	---	0.068 (0.900)	---	---	0.070 (0.890)	---
Any physical results from violence	---	---	0.316 (2.610)***	---	---	0.149 (1.220)	---	---	0.464 (3.670)***
Women hurt during pregnancy by husband	0.037 (0.330)	0.121 (1.090)	0.032 (0.280)	0.140 (1.220)	0.108 (0.980)	0.132 (1.150)	0.045 (0.380)	0.010 (0.090)	0.146 (1.240)
Demographics Characteristics of Household									
Household size	-0.010 (-1.080)	-0.009 (-1.030)	-0.010 (-1.080)	0.008 (0.890)	0.009 (0.920)	0.009 (0.930)	-0.001 (-0.120)	-0.001 (-0.080)	-0.001 (-0.140)
Age head of household	0.007 (2.600)***	0.007 (2.610)***	0.007 (2.680)***	0.001 (0.570)	0.001 (0.560)	0.001 (0.600)	0.001 (0.520)	0.001 (0.510)	0.001 (0.570)

Head of household is male	0.161 (1.350)	0.156 (1.300)	0.152 (1.280)	-0.038 (-0.330)	-0.043 (-0.380)	-0.042 (-0.370)	0.082 (0.670)	0.074 (0.610)	0.071 (0.590)
Other Characteristics of the Dwellings									
Place of Residence									
Rural/Urban	0.046 (0.580)	0.047 (0.590)	0.041 (0.520)	0.046 (0.590)	0.048 (0.600)	0.051 (0.640)	-0.016 (-0.190)	-0.015 (-0.180)	-0.013 (-0.160)
Regions/Province									
Sindh	-0.434 (-3.430)***	-0.444 (-3.520)***	-0.439 (-3.470)***	-0.293 (-2.400)***	-0.305 (-2.510)***	-0.305 (-2.500)***	-0.591 (-4.610)***	-0.606 (-4.740)***	-0.608 (-4.750)***
Punjab	-0.400 (-3.090)***	-0.419 (-3.230)***	-0.403 (-3.120)***	-0.432 (-3.410)***	-0.431 (-3.390)***	-0.443 (-3.510)***	-0.658 (-4.980)***	-0.661 (-4.980)***	-0.666 (-5.050)***
Khyber-Pakhtunkhwa	0.068 (0.510)	0.024 (0.190)	0.081 (0.620)	0.101 (0.780)	0.085 (0.660)	0.082 (0.640)	0.047 (0.360)	0.018 (0.140)	0.057 (0.430)
Balochistan	0.449 (3.330)***	0.417 (3.110)***	0.461 (3.440)***	1.017 (7.210)***	0.999 (7.150)***	1.000 (7.150)***	0.471 (3.480)***	0.446 (3.310)***	0.480 (3.560)***
Islamabad	-0.201 (-1.190)	-0.234 (-1.380)	-0.208 (-1.240)	-0.329 (-1.970)**	-0.335 (-2.010)***	-0.352 (-2.130)***	-0.450 (-2.610)***	-0.462 (-2.670)***	-0.467 (-2.720)***
Wealth Quintiles	-0.028 (-0.660)	-0.031 (-0.720)	-0.021 (-0.490)	-0.047 (-1.120)	-0.047 (-1.120)	-0.046 (-1.080)	-0.016 (-0.350)	-0.015 (-0.340)	-0.018 (-0.410)
Facilities at home	-0.047 (-1.200)	-0.047 (-1.210)	-0.049 (-1.260)	-0.006 (-0.160)	-0.005 (-0.120)	-0.005 (-0.130)	-0.022 (-0.530)	0.023 (0.570)	0.025 (0.610)
Physical Assets	-0.010 (-0.300)	-0.010 (-0.290)	-0.010 (-0.300)	-0.054 (-1.570)	-0.053 (-1.570)	-0.053 (-1.560)	-0.051 (-1.440)	-0.050 (-1.420)	-0.050 (-1.420)
Media Exposure	-0.122 (-2.720)***	-0.123 (-2.750)***	-0.123 (-2.740)***	-0.135 (-3.020)***	-0.135 (-3.030)***	-0.136 (-3.030)***	-0.164 (-3.550)***	-0.164 (-3.560)***	-0.165 (-3.570)***
Characteristics of the Child									
Child is from multiple birth	-0.594 (-1.800)*	-0.573 (-1.740)*	-0.601 (-1.820)*	-0.396 (-1.280)	-0.393 (-1.270)	-0.391 (-1.260)	-0.511 (-1.510)	-0.500 (-1.480)	-0.520 (-1.540)
Child is male	-0.012 (-0.190)	-0.015 (-0.240)	-0.008 (-0.130)	0.074 (1.200)	0.075 (1.210)	0.073 (1.190)	-0.074 (-1.170)	-0.075 (-1.170)	-0.075 (-1.170)
Age of child in months	-0.127 (-4.850)***	-0.128 (-4.880)***	-0.130 (-4.940)***	-0.001 (-0.030)	-0.001 (-0.040)	-0.000 (-0.000)	-0.113 (-4.190)***	-0.113 (-4.210)***	-0.115 (-4.250)***
Child lives elsewhere	1.172 (1.200)	1.075 (1.100)	1.099 (1.120)	0.985 (1.070)	0.947 (1.030)	0.895 (0.980)	1.491 (1.570)	1.422 (1.500)	1.362 (1.440)
Women's Status (other indicators)									
Age of women<18	0.013 (0.030)	0.003 (0.010)	0.059 (0.130)	0.099 (0.230)	0.097 (0.230)	0.116 (0.270)	-0.178 (-0.400)	-0.182 (-0.410)	-0.120 (-0.270)

Age of women>35	0.034 (0.410)	0.037 (0.440)	0.050 (0.590)	-0.016 (-0.190)	-0.014 (-0.170)	-0.014 (-0.170)	0.006 (0.070)	0.010 (0.110)	0.023 (0.270)
Educational attainment	-0.174 (-3.660)***	-0.178 (-3.750)***	-0.178 (-3.750)***	-0.203 (-4.260)***	-0.206 (-4.330)***	-0.204 (-4.300)***	-0.215 (-4.370)***	-0.219 (-4.470)***	-0.218 (-4.430)***
Working Status	-0.149 (-1.760)*	-0.155 (-1.830)*	-0.155 (-1.830)*	-0.224 (-2.670)***	-0.226 (-2.700)***	-0.225 (-2.680)***	-0.226 (-2.530)***	-0.229 (-2.570)***	-0.219 (-2.450)***
Pregnancy Risk	0.000 (-0.050)	-0.001 (-0.120)	-0.001 (-0.110)	-0.004 (-0.410)	-0.004 (-0.400)	-0.004 (-0.460)	0.000 (-0.030)	0.000 (-0.040)	-0.001 (-0.120)
Gender Differences									
Age difference between husband and wife (years)	-0.000 (-0.050)	-0.000 (-0.060)	-0.000 (-0.020)	0.004 (0.690)	0.004 (0.700)	0.004 (0.650)	0.000 (0.010)	0.000 (0.030)	0.000 (0.050)
Education difference between husband and wife (years)	0.031 (0.910)	0.033 (0.990)	0.027 (0.800)	0.017 (0.510)	0.017 (0.520)	0.017 (0.500)	0.006 (0.180)	0.007 (0.200)	0.003 (0.100)
Constant	-0.229 (-0.840)	-0.240 (-0.880)	-0.231 (-0.850)	-0.197 (-0.720)	-0.192 (-0.710)	-0.205 (-0.750)	0.064 (0.230)	0.067 (0.240)	0.064 (0.230)
Observations	**1881**	**1881**	**1879**	**1881**	**1881**	**1879**	**1881**	**1881**	**1879**

*Note: Figures in parenthesis are absolute values of z statistics, * significant at 10 percent, ** at 5 percent and *** at 1 percent level.*

Table 10 Marginal effects (at the mean and average marginal effect) margins, dydx (*) at means of mother's health inputs, children's health outcomes and domestic violence against ever-married women aged (15-49).

Dependent Variables Children's health outcomes	**Stunted**		**Wasted**		**Underweight**	
Explanatory Variables	Marginal effects at the mean	Average marginal effects	Marginal effects at the mean	Average marginal effects	Marginal effects at the mean	Average marginal effects
Mother's Health Inputs						
Antenatal Visits	-0.005	-0.004	-0.007***	-0.007***	-0.006	-0.005
Iron tablets	-0.055***	-0.050***	-0.013	-0.011	-0.009	-0.008
Breastfeeding	-0.090	-0.082	-0.038	-0.034	-0.026	-0.023
Prenatal care	-0.008	-0.007	-0.003	-0.003	-0.018	-0.016
All Vaccinations	-0.032***	-0.030***	-0.030***	-0.027***	-0.031	-0.028
Domestic Violence (DV)						
Physical violence	0.042	0.038	0.029	0.026	0.025	0.023
Emotional violence	0.050	0.046	0.008	0.007	0.010	0.009
Any physical results from violence	0.118***	0.108***	0.042	0.037	0.157***	0.141***
Women hurt during pregnancy by husband	0.010	0.009	0.069	0.061	0.059	0.053
Demographics Characteristics of Household						
Household size	-0.004	-0.003	0.003	0.003	-0.001	-0.000
Age head of household (years)	0.003***	0.002***	0.001	0.001	0.001	0.000
Head of household is male	0.059	0.054	-0.015	-0.014	0.027	0.024
Other Characteristics of the Dwellings						
Place of Residence						
Rural/Urban	0.553	0.014	0.020	0.017	-0.005	-0.004
Regions/Province						
Sindh	-0.159***	-0.146***	-0.117***	-0.103***	-0.213***	-0.192***
Punjab	-0.156***	-0.143***	-0.170***	-0.150***	-0.235***	-0.212***
Khyber-Pakhtunkhwa	0.030	0.027	0.042	0.037	0.024	0.022
Balochistan	0.174***	0.160***	0.402***	0.355***	0.174***	0.157***
Islamabad	-0.083***	-0.076***	-0.130***	-0.115***	-0.163***	-0.147***

Wealth Quintile	-0.009	-0.008	-0.019	-0.016	-0.006	-0.006
Facilities at home	-0.018	-0.016	-0.002	-0.002	-0.009	-0.008
Physical Assets	-0.004	-0.004	-0.021	-0.019	-0.018	-0.016
Media Exposure	-0.046***	-0.042***	-0.053***	-0.047***	-0.058***	-0.053***
Characteristics of the Child						
Child is from multiple birth	-0.223	-0.204	-0.158	-0.140	-0.186	-0.167
Child is male	-0.004	-0.003	0.029	0.026	-0.026	-0.024
Age of child in months	-0.049***	-0.045***	-0.000***	-0.000***	-0.041***	-0.037***
Child lives elsewhere	0.411	0.377	0.380	0.336	0.496	0.446
Women's Status (other indicators)						
Age of women<18	0.022	0.020	0.045	0.040	-0.043	-0.039
Age of women>35	0.018	0.016	-0.006	-0.006	0.007	0.007
Educational attainment	-0.066***	-0.060***	-0.080***	-0.070***	-0.077***	-0.069***
Working Status	-0.058**	-0.053**	-0.088***	-0.077***	-0.077***	-0.069***
Women takes decisions about own health care	-0.030	-0.027	-0.008	-0.009	-0.021	-0.019
Pregnancy Risk	-0.001	-0.001	-0.002	-0.001	0.000	0.000
Gender Differences						
Age difference between husband and wife (years)	-0.000	-0.000	0.002	0.001	0.000	0.000
Education difference between husband and wife (years)	0.011	0.010	0.006	0.005	0.001	0.001
Number of observations	**1879**		**1879**		**1879**	

*Note: *, **, *** are the absolute values of z statistics, significant at 10, 5 and 1 percent level, respectively.*

Table 11a Tabularization of stunned, wasted and underweight children

Children's Health Outcomes									
Tabulate	**Stunned** (height/age)			**Wasted** (weight/height)			**Underweight** (weight/age)		
	No	Yes	Total	No	Yes	Total	No	Yes	Total
Frequency	1562	998	2560	1,387	1,173	2,560	1655	905	2560
Percent	61.02	38.98	100.00	54.18	45.82	100.00	64.65	35.35	100.00
Cumulative	61.02	100.00	---	54.18	100	---	64.65	100.00	---

Table 11b Estimated predicted probabilities of children's health output (Stunned, Wasted, and Underweight).

Variables	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Stunned Children	2560	0.389	0.488	0	1
pprobit	1885	0.373	0.162	0.029	0.870
Wasted Children	2560	0.459	0.499	0	1
pprobit	1885	0.374	0.162	0.029	0.870
Underweight Children	2560	0.354	0.479	0	1
pprobit	1885	0.374	0.162	0.028	0.870

Table 11c Percent correctly predicted values of probit model for children's health output (Stunned, Wasted, and Underweight) (estat classification).

Stunned				**Wasted**				**Underweight**			
-------- True --------				-------- True --------				-------- True --------			
Classified	D	~D	Total	Classified	D	~D	Total	Classified	D	~D	Total
+	257	173	430	+	386	182	568	+	234	136	370
-	443	1006	1449	-	443	868	1311	-	394	1115	1509
Total	700	1179	1879	Total	829	1050	1879	Total	628	1251	1879

Classified + if predicted Pr(D) >= 0.5				
True D defined as Stunned, Wasted and Underweight Children!=0				
		Stunned (%)	Wasted (%)	Underweight (%)
Sensitivity	Pr(+ | D)	36.71	46.56	37.26
Specificity	Pr(-| ~D)	85.33	82.67	89.13
Positive predictive value	Pr(D + |)	59.77	67.96	63.24
Negative predictive value	Pr(~D - |)	69.43	66.21	73.89
False + rate for true ~D	Pr(+| ~D)	14.67	17.33	10.87
False - rate for true D	Pr(- | D)	63.29	53.44	62.74
False + rate for classified +	Pr(~D | +)	40.23	32.04	36.76
False - rate for classified –	Pr(D - |)	30.57	33.79	26.11
Correctly classified		**67.22**	**66.74**	**71.79**

Appendix A

The model, assumes that both partners have individual utility functions that depend on the consumption of goods and services (M), leisure (L) and children's quality i.e. health (H_c). The utility function of each individual is of subsequent type[11]:

$$U^i_{max} = U^i(M, L, H_c) \dots (1)$$

Every individual has a threat point or reserve utility ($\bar{U}^i$), suggesting that individual would gain utility, independently outside the household. It is assumed that the reserve utility level of each individual (i) depends on two things. Firstly, power to make decisions in the household i.e. decisions linked to health (D) and secondly, a vector of prices (P). The model also assumed that ability for making decisions is a function of bargaining power of each individual, represented by (τ).

$$\bar{U}^i = \bar{U}^i\{\tau, P\} \dots (2)$$

Along with other determinants of bargaining power, the study mainly used domestic violence in household. Moreover, woman's work status and differences in age and education between partners are also incorporated. The model hypothesized that higher bargaining power would result in resource allocation decisions of that partner's preferences that ultimately increase his reserve utility.

The demand for health inputs depends on the bargaining power of each individual, household (H_h), community characteristics (C_c) and input's prices(P_D).

$$D = D(\tau, H_h, C_c, P_D) \dots (3)$$

Children's nutritional health outcomes (H_c) depends on mother's health inputs (D), community factors (C_c) as well as risk factors of woman's health (δ). The community issues may directly influence health outcomes i.e. access to medical facilities, sanitation infrastructure and prices. Risk and woman's health factors affecting children's health gauge woman's nutritional characteristics and pregnancy risks.

$H_c = H_c(D, C_c, \delta) \dots (4)$

The optimization problem of household involves preferring M, D and L to maximize utility, depends on the difference between the utility level and the reserve utility of both partners.

$$\max U^{M,D,L} = U\left(U^h - \bar{U}^h, U^w - \bar{U}^w\right) \dots (5)$$

Subject to a following budget constraint where $P_M M$ is the vector of commodity prices, W^i is the wage of each individual, P_D is a vector of inputs prices and, Y_h and A_h symbolize for household's total income and assets, respectively.

$$P_M M + W^h L^h + W^w L^w + P_D D = Y_h + A_h \dots (6)$$

If $U^i - \bar{U}^i > 0$ there is utility gained from living in the household. From this maximization problem, a reduced-form equation is developed for children's health that depends on health inputs, community (C_c) and pregnancy risk factors, commodity and inputs prices and wages of husband and wife W^h and W^w, income Y_h and assets A_h of household.

$$H_c = H_c(D, C_c, \delta, P_M, P_D, W^h, W^w, Y_h, A_h) \dots (7)$$

Prices (P), built-in in equation (2), set the vector prices and wages of husband and wife.

$$P = \left\{P_M, P_D, W^h, W^w\right\} \dots (8)$$

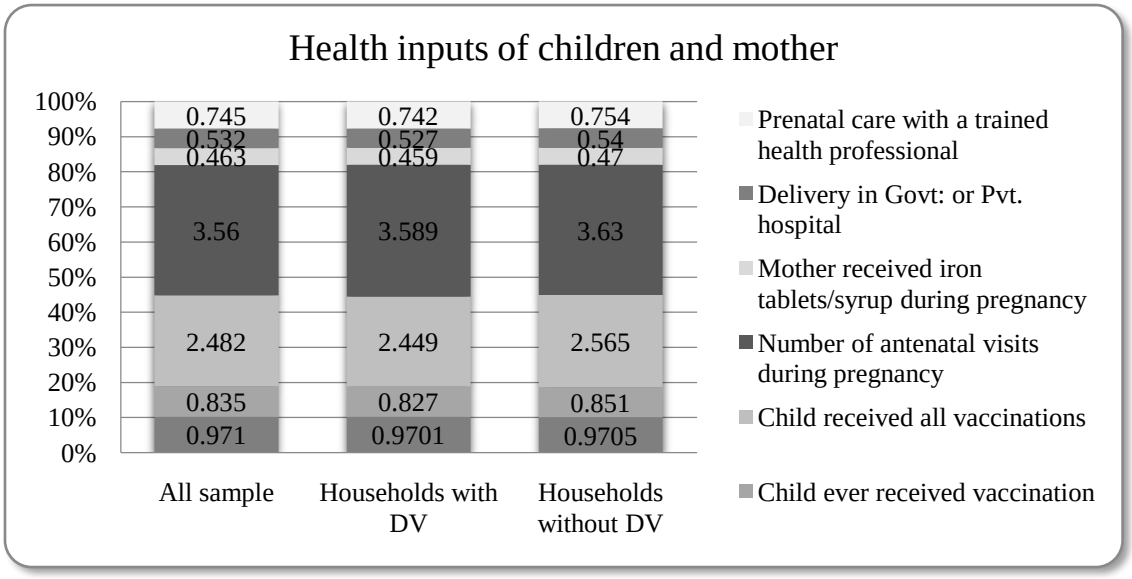
Thus, children's health can be represented as;

[11] Where, U^i represent the utility function of each individual i.e. husband and wife.

$$H_c = H_c(D, C_c, \delta, P, Y_h, A_h) \dots (9)$$

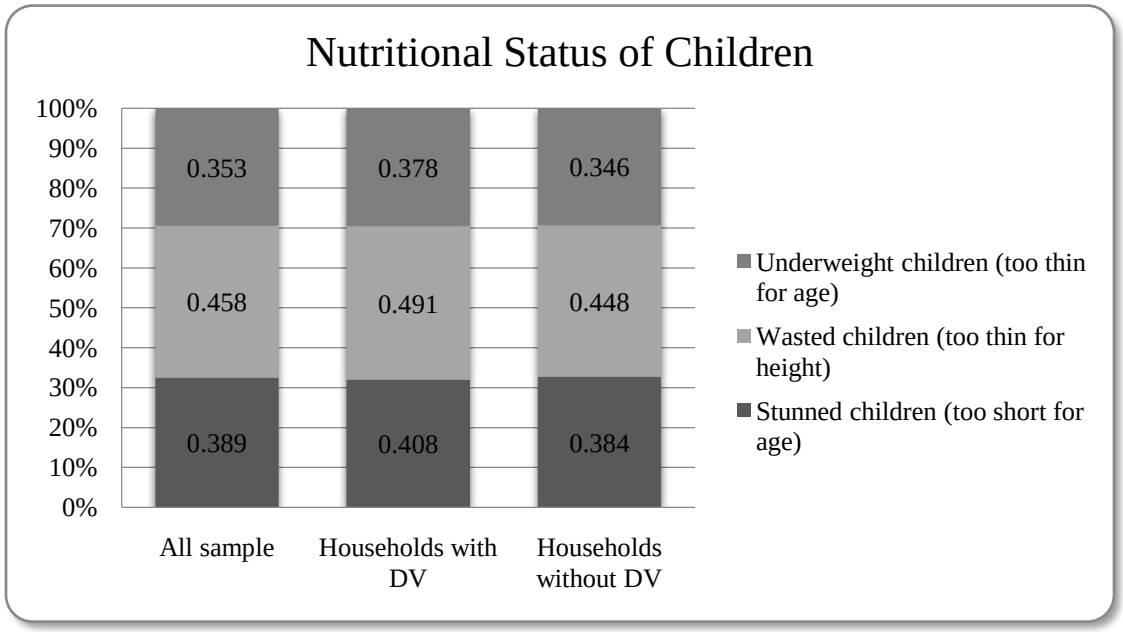
Using the reduced form of equations (3) and (9), the demand for health inputs and health outcomes are estimated, respectively. The proposed model is more concerned about the parameter of domestic violence which shows women's status in the households (τ). As a result, designed model, anticipates that domestic violence affects indirectly children's health outcomes, via its effect on demand for health inputs.

Figure02 Health inputs of children and mother with and without violence in Pakistan



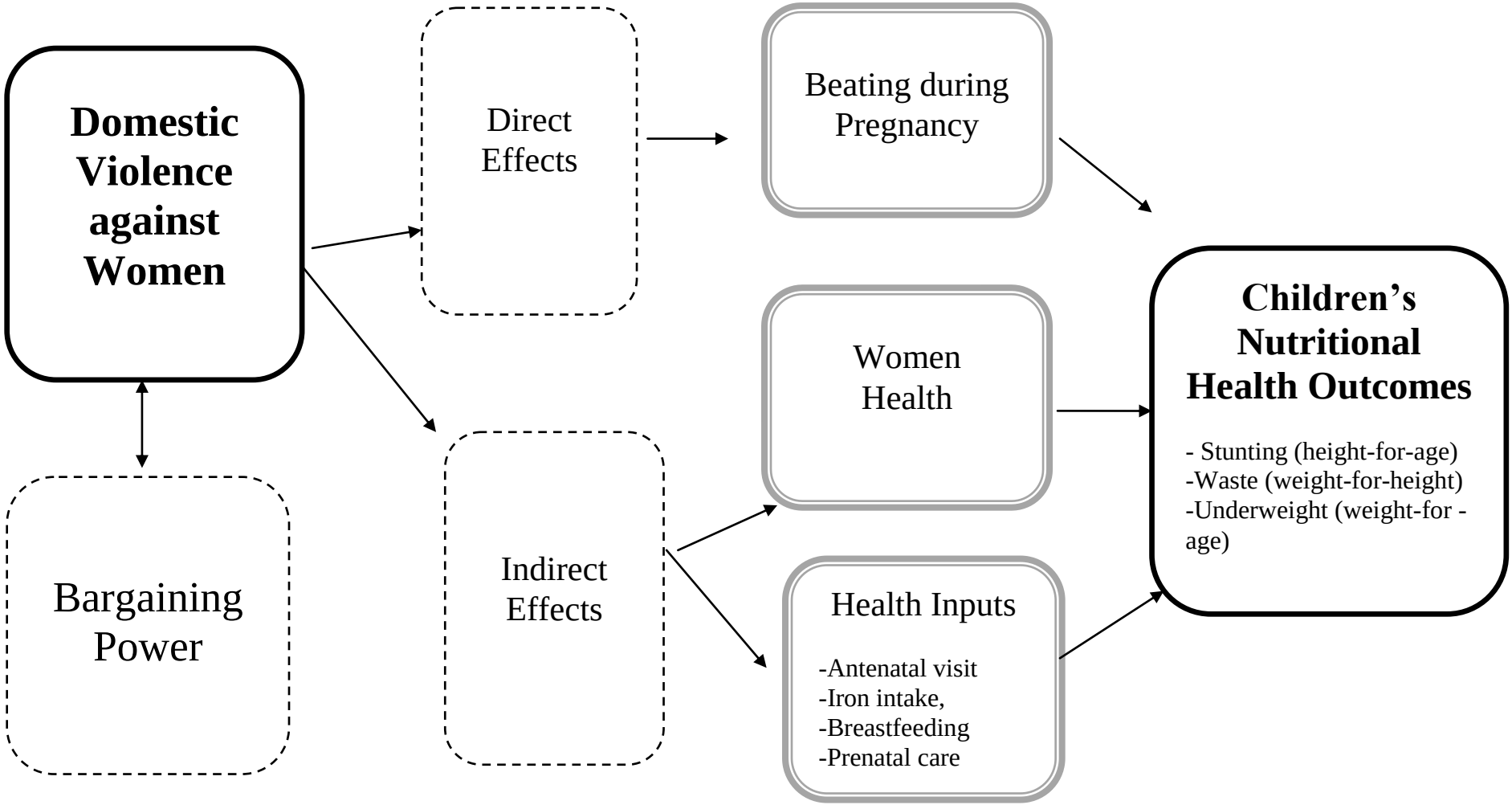
Source: Author's compilation of Pakistan Demographic and Health Survey (2012-13)'s data

Figure03 Nutritional health outcomes of children (under 5) with and without violence in Pakistan



Source: Based on the new World Health Organization Standards of Child's Growth

Figure 01 Conceptual framework for exploring the effects of domestic violence against women on children's nutritional health outcomes



Author's own creation