GENDER ANALYSIS OF MALNUTRITION: A CASE STUDY OF SCHOOL-GOING CHILDREN IN BAHAWALPUR

check for updates

Tasnim Khan[1]
Rana Ejaz Ali Khan[2+]
Muhammad Ali Raza[3]

[1]Associate Professor, Department of Economics The Islamia University of Bahawalpur, Bahawalpur, Pakistan
[2]Associate Professor and Chairman, Department of Economics The Islamia University of Bahawalpur, Bahawalpur, Pakistan
[3]Research Assistant at Center for Business and Economics Research, Institute of Business Administration, Karachi, Pakistan

(+ Corresponding author)

ABSTRACT

The literature confirmed the existence of gender discrimination in children's health, nutrition and education in South Asia. This study examines, whether there are sex differences in stunting and wasting among schooling-going children (5-14 years) and how they are affected by socioeconomic factors. A sample of 684 school-going children of both sexes (376 male children and 308 female children) was selected randomly from different schools of both urban and rural areas of Bahawalpur. Weight and height were taken according to anthropometric measurements. The nutritional indices of World Health Organization (WHO) and the Center for Disease Control (CDC) were used as nutritional standards. The stunting and wasting rates were found 10.1 and 15.2 percent for males and 15.2 and 25 percent for female children respectively. The binary logistic regression for two indices of malnutrition, i.e. wasting and stunting were run separately for male children and female children to determine gender discrimination in nutritional status of children. The probability of being stunted and wasted by increase in age was found significantly lower for females as compared to male children. The male and female children of nuclear households have higher probability to be stunted and wasted respectively but the effect has been found more severe for female children. Mother's education emerged as one of the most important variables which decrease the probability of stunting for both male and female children. The effect is found more favorable for male as compared to female children. Household income status and living condition index has shown no significant effect on probability of malnutrition of male and female children.

1. INTRODUCTION

Eradication of malnutrition is a great policy concern as it is a violation of human rights and it causes massive cost to society. Malnourished children are less productive physically and intellectually, and remain vulnerable to physical disability and chronic diseases. Malnutrition among children has lifelong implications, the outcomes not only cover the whole life but they transfer from one generation to the other (Khan and Khan, 2004). The phenomenon of malnourished female child is more important in the context of her future role as a mother, who being a stunted mother gives birth to a stunted child and the circle turns around. The consequences of nutritional status of a female child is a process which goes along her whole life cycle and without appropriate intervention leads to intergenerational transfer, from mother to child. There are evidences in literature that mothers' lower nutritional status measured by body mass index enhances the probability of underweight children (Hien and Hoa, 2009). The underweight children experience negative long-run health outcomes. They have reduced adult height, high blood glucose concentration, deficit cognitive skills and increased chances of mental illness. It boosts the significance of nutritional status of females. The gender disparity in nutritional status is one of the causes of malnutrition in female children. The facts enhance the significance of gender analysis of malnutrition in children. Gender equity is a basic human right and discrimination in access to resources and opportunities imposes substantial costs on a nation's productivity and economic growth as well as on the social welfare of the people (King and Mason, 2001). In South Asia the gender discrimination in health, education and nutrition is evidenced by a number of studies Biswas *et al.* (2001) for immunization in children in Bangladesh; (Khan, 2005) for child schooling in Pakistan). It is also lower than anywhere in the world. Gender related Development Index of South Asia is worst in the world (UNDP, 2000). The gender disparities in health outcomes in this region are also among the largest in the world. In much of South Asia, sons are preferred over daughters for a number of economic, social and religious reasons, including financial support, old-age security, property inheritance, dowry, family lineage, prestige and power, birth and death rituals, and belief about religious duties and salvation (Arnold *et al.*, 2002). Strong preference for sons often manifests itself in the form of discrimination against daughters. It is believed to be responsible for many discriminatory practices against female children in feeding, health-care and education Ravindaran and Mishra (2000) and ultimately for excess female child mortality. One of the major causes of malnutrition in south Asia is the significantly higher proportion of underweight births. In Pakistan one quarter children are born with low birth-weight (Mehrotra, 2006) that is an indication of the existence of malnutrition in women, which starts at their early phase of childhood. It creates an intergenerational cycle of malnutrition in females. The World Bank (2005) gender assessment of Pakistan explains that female children in poorer households are significantly less likely to use health-care facilities than male children. In Pakistan, a mother as the primary caretaker of children not only takes pride in bearing sons but also makes extra effort to maintain their health in the best state as the survival of sons is considered to be a source of strength for herself. Moreover, in this patriarchic society, the survival of sons also embodied the desire to carry forward the family name. The gender aspect

of malnutrition along with education (Khan, 2005;2008) also exists in a number of developing economies. On the other hand the literature on intra-household distribution of food has shown little evidence of discrimination against female children in feeding (Haddad *et al.*, 1996). Basu (1993) analyzing field data from India and having a review of literature on household allocation of food in South Asia, where anti-female discrimination is believed to be widespread, found no evidence that female children are discriminated in feeding. Mishra *et al.* (1999) analyzed data from national survey of India and found that male children and female children are about equally likely to be stunted and underweight but male children are slightly more likely than female children to be wasted. Similarly a review of child nutrition surveys from developing economies by Marcoux (2002) concluded that evidences on gender discrimination in under-nutrition do not support the notion that anti-female bias in intra-household food allocation and health-care is causing this excess female under-nutrition. It shows that not only gender discrimination in malnutrition of children is still inconclusive but its factors are also varying and contradicting. The current study will attempt to see the extent of gender discrimination in nutritional status of children and its causing factors for Pakistan in the form of a case study from Bahawalpur.

The anthropometrically measured nutritional status of children is a result of number of inputs like access to food, availability of medical services, their use, care given to the child, allocation of food within household members, immunization to children, mother's reproductive behavior, parent's employment status, family size, and community characteristics like provision of electricity, safe drinking water and basic health units to the households. Majority of them may differently affect the nutritional status of male and female children. We will try to explore what factors are responsible for gender discrimination in malnutrition of children in the age group of 5 to 14 years. In the last decade, poverty in Pakistan has largely increased, 34 percent of the population is living below poverty. Income inequality has largely increased. Poverty level in southern Punjab is higher than upper Punjab. The situation is significant to have a deep insight into the matter of malnourishment of children in Southern Punjab in gender perspective. Bahawalpur is more likely to represent Southern Punjab. The precise objective of current study is to see the socioeconomic determinants of gender discrimination in nutritional status of school-going children in Bahawalpur using primary data.

2. LITERATURE REVIEW

The existing literature on nutritional status of children covers different dimensions ranging from its impacts and causes to geographic differences. The gender aspect has also been focused but comparatively at smaller scale. Generally a higher prevalence of malnutrition has been observed in male children than female children (Mian *et al.*, 2002; Ukwuani and Suchindran, 2003; Hien and Hoa, 2009). More female children as compared to male children have been found stunted in households of poor socioeconomic status than in households of good socioeconomic status (Wamani *et al.*, 2004). On the other hand in some countries such as Siri Lanka, gender of child did not appear to influence nutritional status of children ((Aturupane *et al.*, 2008) see also (Bourne, 2009)). The results showing no relationship between gender of child and health status are not

consistent to existing figures as female children are discriminated in south Asia and Sub-Saharan Africa and are more subject to underweight than male children. Strong son preference is partly reflected by high male/female population sex ratio in India (Visaria and Visaria, 1995). The gender discrimination is also evidenced in children activities like education and child labor (Khan, 2008). Malnutrition is the result of low income which reduces the capacity of household to purchase required calories of food, (World Bank, 2002). The provision of sufficient caloric requirement reduces the child morbidity, stunting, wasting and underweight, (Haddad *et al.*, 1996). The income is purely related with gender aspect in the form that due to scarcity of resources, the male children are given the resources as required and the female children are ignored (Khan, 2005;2008). The gender discrimination in nutritional status of children through birth-order and sex composition of children has been discussed in literature. Pande (2003) examined the role of sex composition of surviving older siblings on gender differences in malnutrition and immunization of younger children. The study used the modified proximate-determinants framework of Mosley and Chen (1984) for analysis of nutritional status of 6-47 months children and immunization status of 12-60 months children. The results have shown the selective neglect of children with certain sex and birth-order combination that operates differentially for female children and male children. Both female and male children who were born after multiple same-sex siblings experience poor outcomes, suggesting that parents want some balance in sex composition of children. However, the preference for sons persists, and male children who were born after multiple daughters have the best possible outcomes. Furthermore, the children with educated mothers and children from wealthier households were found less likely to be stunted and having better immunization. Similarly the children from extended families were less likely to severely stunted and had high odd of better immunization.

Mishra *et al.* (2004) have probed the differences in childhood feeding, health-care and nutritional status of children (up to 35 months) using the data from National Family Health Survey. The study attempted to see the gender discrimination in nutritional status of children for birth-order and composition of living siblings. It concluded that presence and extent of gender discrimination depend on birth-order of the child and sex composition of older living siblings. Discrimination against female children was found visible in families with no living sons, particularly at birth-orders 3 and 4+. There was evidence of discrimination against male children in families where older siblings were all male children. Regarding measures of nutritional status, there was clear evidence of gender discrimination for stunting and underweight, but not for wasting. Furthermore, gender discrimination against girls at aggregate analysis has no evidence. The findings suggested three possible reasons for the lack of evidence of gender discrimination pertaining to children' nutritional status in aggregated analysis (Marcoux, 2002). First, discrimination against female children is not as wide spread as argued and generally believed. It is limited to children of certain birth-orders and sex compositions of older siblings, who constitute a relatively small fraction of all children, resulting in a small overall effect. Second, discrimination against female children when male children are in short supply and discrimination against male children when female children are in short supply cancel each other to some extent. Third, some

discrimination against female children (for example, in exclusive breastfeeding at age 6-9) harms male children more than female children, also cancel out discrimination against female children to some extent. For Bangladesh, Muhuri and Preston (1991) have shown that girls with older sisters have significantly higher mortality risk than do girls with only surviving older brothers or girls with no surviving older siblings. It supports the findings by Mishra et al. (2004) that gender discrimination in nutritional status of children depends upon birth-order and sex composition.

The provision of health and infrastructure facilities affect the nutritional status of male and female children differently, has been focused in literature regarding nutritional status of children. Holmes (2006) has examined the impact of local infrastructure and community prices on gender aspect of nutritional outcomes of children (under six years) in Pakistan. Standardized height and weight of rural children were used as nutritional outcomes, while community factors like wheat prices, availability of piped water, accessibility of shops and government health clinics and the quality of closest health facilities were taken as explanatory variables. The results suggested that food subsidies and programs designed to improve the access and quality of local services may reduce the intra-household gender bias in child nutrition, particularly in the long-run. By increasing the affordability of staple foods, improving the access to shops and government health centers, and enhancing the quality of local health-care (particularly gender-neutral prenatal-care) the gender gaps in nutritional outcomes may be diminished. Evidences are existing showing that birth-order of the child, gender of the child, number of children, household income, mother's education, place of residence, sanitary conditions and wealth status of the household have significant effect on nutritional status of children. Majority of these factors are related with parental household behavior. Such factors affect the nutritional status of male and female children differently. Mondal et al. (2012) have analyzed the gender discrimination in nutritional status of school-going children (6-15 years) in India, by using under-weight and stunting as measures of nutritional status. The study using the primary data of 725 children from Bengalee ethnicity attempted to see the impact of household per-capital income, father's occupational status, number of living rooms in the household, number of siblings in the family on nutritional status of male and female children. The estimates have shown a higher ratio of underweight and stunting in female children as compared to male ones. The household per-capital income, father's occupational status as manual worker and number of rooms (one living room) in the household were found positively associated with malnutrition in female children but not in male children. The gender differences in these associations may be due to discriminatory behavior of the parents. In the case of per-capita income of the household, female children belonging to lower per-capita households were more likely to be discriminated and having greater chances of malnutrition. Similarly, manual type of father's occupation tends to low income and time consuming occupation, resulted in significant impact on malnutrition. It increases the chances of discrimination against female children. Gender bias in health-seeking behavior about children's nutritional status by parents in the perspectives of different household socioeconomic status has also been observed in the literature. Alderman and Gartler (1997) have shown that low-income households in Pakistan have been more likely to seek health-care and better quality care for sick sons than sick daughters.

The nutritional status of children is generally measured irrespective of gender of the child. It cannot be assured that all children and household members have the same level of wellbeing (Sahn and Younger, 2005). The children's nutritional status in the perspective of household poverty may differ for male and female children. There are evidences that poverty status of household does not correlates with health status of male children, but negatively relates with that of female children. It indicates discrimination in the allocation of resources within households. Poor households allocate their limited resources for nutritional facilities to male children but not to female children. Such type of discrimination against females in inter-family food distribution and poor health-care are major determinants of female child mortality in Bangladesh (Choudhury et al., 2000). In South Asia, generally women serve meal to their husbands and sons and eat after them along with their daughters so inadequate and low quality food is left for them (Mehrotra, 2006). Chen et al. (1980) established a close link between child's nutrition and mortality. The probability of dying of female children is largely higher than male children in India and Bangladesh (DasGupta, 1987; Muhuri and Preston, 1991) that is due to pro male bias in allocation of household resources between male and female children. In the literature the mother's education has shown stronger effect on child's nutritional status than other demographic and economic variables (Mukherjee et al., 2008). The mother's education effect has been found about twice larger than father's education in Ethiopia (Christiansen and Alderman, 2004). The mother's education even has shown different impact on male and female children' nutritional status. The education of mother is evidenced to be strongly related with nutritional status of male children than female children in Bangladesh which represents the inferior position of women in society (Choudhury et al., 2000). The number of children in the household and the family size also affect the nutritional status of children. It is evidenced in the literature that the number of ever born live children negatively affects nutritional status of a child because in poor families competition for available food is increased (Hien and Hoa, 2009). Secondly, the mother is able to devote less time to child care than mother who has two children or more. Thirdly, the fact of mortality rate of later born children higher than for first order born children is also relevant with number of children (Pande, 2003). The effect of number of children in the household is also related with gender aspect of the children. When there are more number of children in the household, the mothers prefer the nutritional needs of the sons (see (Khan, 2005;2008) for children' education). Besides the socio-demographic factors, there are some other factors which determine the nutrition status of children. Among them highly risk factors for the infants are breastfeeding and avoidance from the incidence of diarrhea, fever and cough, etc. which reduce the risk of malnutrition (Hien and Hoa, 2009). These factors are also concerned with the gender of the child as the measures are delivered through the mothers. There are some determinants of malnutrition in children which may be linked to the gender of the child. One of them is mother's weight-for-height and body structure which affects the child through phenotype and genotype (Garcia and Alderman, 1989). It is genetic factor which may not be connected with the gender aspect of the child's nutritional status. Majority of the factors discussed in this section are concerned with mother, parents or

household's health-seeking behavior towards children. The core of the current study is to analyze how differently they affect the malnutrition in male and female children.

3. THEORETICAL BACKGROUND AND METHODOLOGY

To examine the effect of sex-composition on gender differences in health status of children, Pande (2003) used a modified proximate-determinants framework (Mosley and Chen, 1984; Mosley, 1985). Originally the model was developed to see the factors of child mortality. Mosley and Chen (1984) proposed five categories of biological and medical proximate determinants of child mortality. They were maternal factors (mother's age and parity), environmental contamination (routes of infection), nutrient deficiency, injury, and personal illness control (prevention and curative measures). All social and economic distal determinants of child mortality operate through these proximate determinants and were grouped into individual, household and community variables. Pande (2003) transformed this framework from mortality to health status outcome. So Pande used the proximate as outcomes themselves. The gender difference in the proximate determinants represents the ways by which household attitude and behavior against girls translate into a worse health status for girls than boys.

This modified Mosley-Chen framework specifies the theoretical relationship between gender differences among children. It also provides a conceptual framework that relates child-level determinants of child health to distal contextual factors such as maternal education, household wealth and community characteristics that influence child health.

Alderman and Gartler (1997) developed a theoretical model of household behavior that focuses on gender discrimination in human capital investment. In their two period model parents drive utility from their own consumption and the wealth of their children. In the first period, parents allocate income between first period consumption and investment in human capital of their sons and daughter. In the second period, transfers from their two children finance parent's consumption. The level of second period transfers depends on their children' wealth and respective remittances returns. In turn, children' wealth is a function of the human capital investment made by parents in the first period as well as the rate of return to these investments. The Alderman and Gartler model provides a compelling explanation of the large gender disparities. But the importance of estimating the determinants of child nutritional outcomes separately for male and female children characterized to explain gender bias cannot be understated (see also (Holmes, 2006)). The etiology of malnutrition is complex. Poor nutritional status is a result of a combination of basic physiological developmental processes, genetic factors, family factors, environmental conditions, and macro-level factors. In the modeling the malnutrition of children living within a multi-person unit called household, we have to look the household which maximizes a preference function:

$$U = U\ (N^i, F^i, L^i, Z^i)\ i = 1, 2, 3,....n\ ...\ \quad ...\ \quad ...\ \quad ...\ \quad (1)$$

Household preferences depend on the nutritional health (N^i), food and nonfood consumption (F^i and Z^i respectively) and leisure (L^i) of individual i. All these are defined as vectors with several dimensions. The utility derived by the household is maximized subject to (1) an income or budget

constraint at given prices (p), and (2) the nutrition-production function. The health and nutrition of child **i** is produced by a number of explicit and implicit behavior and characteristics relating to food consumption (F^i), amount of time devoted to child care (T^i), and individual child characteristics (A^i) – observed and unobserved – such as age, sex, genetic endowments, education, as well as household characteristics (M^i) like parental education, parental genetic endowments and other observed and unobserved household and community factors (e^i), including prices. The nutritional production-function for child *i* may therefore be formalized in the following relations:

$$N^i = f^1 (F^i, T^i, A^i, M^i, e^i) \quad \text{where } i = 1, 2, \ldots n \qquad \ldots \qquad (2)$$

Equation (2) used in examining the determinants of malnutrition in children is commonly used in recent literature. The main estimating equation to be used in the present study derived from this model is expressed as:

Z – Scores HA, WA, = f (AGE_{ij}, $BORD_{ij}$, $YSIB_{ij}$, $MLIT_{ij}$, $MEDU_{ij}$, $MWSTAT_{ij}$, $FLIT_{ij}$, $FEDU_{ij}$, $NCIHD_{ij}$, $FSYS_{ij,}$ $HHES_{ij}$, $LINDEX_{ij}$ $LOC_{ij,}$) ……….. (3)

Where

Z-Score HA = Z-Score height for age

Z-Score WA = Z-Score weight-for-age

AGE = Child's age in months

BORD = Child's birth-order

YSIB = Young siblings

MLIT = Mother's literacy status

MEDU = Mother's education

MWSTAT = Mother's working status

FLIT = Father's literacy status

FEDU = Father's education

NCHILD = Number of children in household

FSYS = Family system

HHES = Household economic status

LINDEX = Living condition index

LOC = Locality of the household

Equation (3) is the general form of series of functions, (separately for male and female children) to be used for two measures of malnutrition, i.e. stunting and wasting.

The operational definitions of the variables[1] for the models (separately for male and female children) have been given in table 1.

---

[1] The literature suggest that all these variables may be associated with gender differences in child health (DasGupta (1987), Muhuri and Preston (1991), Basu (1993), Choudhury, Hanifi, Rasheed and Bhuiya (2000), Marcoux (2002), Pande (2003), Mishra, Roy and Retherford (2004), Mondal, Biswas and Bose (2012).

3.1. Measurements of Variables

The nutritional indices of World Health Organization (WHO) and the Center for Disease Control (CDC) have been used as nutritional standards. It is international reference based on the assumption that every child from every group has the same genetic potential for growth (Mukuria et al., 2005).

Tabel-1. Operational Definitions of the Variables

Variables	Definitions
Dependent Variable	
MSC (Malnutritional status of child)	1 if the child is malnourished (falls in stunting, wasting), 0 otherwise
Explanatory Variables	
AGE (Child's age)	Child's age in completed months
BORD (Birth-order)	Child's birth-order
YSIB (Young siblings)	Number of young siblings (up to 5 years) in the household
MLIT (Mother's literacy status)	1 for literate, 0 otherwise
MEDU (Mother's education)	Completed years of formal education of mother
MWSTAT (Mother's working status)	1 if mother is working, 0 otherwise
FLIT (Father's literacy status)	1 for literate, 0 otherwise
FEDU (Father's education)	Completed years of formal education of father
NCHILD (Number of children)	1 if number of children (5-14 years) >2, 0 otherwise
FSYS (Family system)	1 for nuclear family, 0 for combined family
HHES (Household economic status)	1 for poor, 0 for non-poor
LINDEX (Living index)	Living condition index of household ranked 0 to 9
LOC (Locality of household)	1 if household is urban, 0 otherwise

The children whose height-for-age and weight-for-age Z-Score are less than -3.0 standard deviation (SD) below than mean on the WHO/CDC international standard are categorized as severely stunted and wasted and the children whose Z-scores are below -2.0 SD are categorized as moderately stunted and wasted respectively. The Z-Scores are sensitive to little change in age. Children with weight-for-age, and height-for-age Z–Scores above +6 SD or below -6 SD are considered invalid for analysis[2]. Similarly, the combinations of Z-Scores where weight-for-age and height-for-age are above +3.09 SD or less than -3.09 SD are also flagged as invalid data. In our analysis we have included the moderately stunted and wasted children.

All the explanatory variables are measured as explained in the operational definition of the variables except household living condition index. Household living index has been constituted from household living condition variables using principal component analysis. Living condition index includes availability of safe drinking water, flushed toilet facility, number of rooms in the house, the availability of electronics, underground sewerage system and quality of housing.

---

[2] A Z-score outside the -6 < Z > +6 is very unlikely and probably indicates an error in measurement Kostermans (1993).

The index has been divided in to quintiles, i.e. poor, middle and rich representing the living condition of the household respectively. The positive health outcomes by improved living conditions have been documented in literature. A reduction in the level of child wasting may be achieved by improving water supply that reduces the risk of diarrhea and illness (Garcia and Alderman, 1989). Clean environment is required for avoiding infectious diseases. The flush toilet availability to the households may lower the spread of infectious diseases which declines the stunting in children (Ukwuani and Suchindran, 2003). It justifies the inclusion of components of index.

3.2. Data Collection and Model

Bahawalpur district is located in the province of Punjab and Bahawalpur city is the twelfth largest city of Pakistan. The district has five *tehsils*. The urban population is 27.34 percent (1998). A sample of 684 school-going children of both sexes (376 male children and 308 female children) aged 5-14 years was selected randomly from different schools of urban and rural areas of Bahawalpur District. A total of 36 urban and rural schools have been covered in the survey. Weights and heights of the children were taken according to required anthropometric measurements. The children were weighted with light weight clothing and calculated nearer 0.1 Kg. The dates of birth of children were taken from school records. The variables whose data was not available or not known at the time of survey were considered "missing". We have adopted the stratified sampling technique so that public as well as private schools may be covered. Alternatively all income group households and socioeconomic groups may be included. We have covered only school-going children. Ideally, the children who are full-time workers and children who are doing nothing or caring the household should also be the part of the sample. The Binary Logistic Regression of two indices of nutrition, i.e. wasting and stunting for both male and female children were run separately to estimate the gender differential among school-going children.

4. RESULTS AND DISCUSSION

The results of binary logistic regression for wasting and stunting for male and female school-going children of Bahawalpur are presented in Table 2. In table 3 average estimates have been shown.

4.1. Child's Age

The nutritional status of child may vary by age. Different levels of food intakes and health-care are required at various stages of age. Child's age is related with nutritional intake and mother's care that ultimately affects anthropometric outcomes. The literature provides both types of relationships between child age and nutritional status. Some studies have found that risk of being malnourished increases by age (see (Mozumder *et al.*, 2000; Mian *et al.*, 2002; Giroux, 2008) for Stunting). It is explained as the older children have inadequate food because their mothers remain busy to feed young children. On the other hand, age of child has shown negative influence

on malnutrition in children (Choudhury *et al.*, 2000). But some of the studies have concluded that the age of child has no effect on child's health status (Mbuya *et al.*, 2010).

Table-2. Results of Binary Logistic Regression for Male and Female Children

Co-Variables	Coefficient (S.E., p-value)			
	Male		Female	
	[Stunting] Height-for-Age (< -2.00)	[Wasting] Weight-for-age (< -2.00)	[Stunting] Height-for-Age (< -2.00)	[Wasting] Weight-for-age (< -2.00)
Child's age (Child's age in months)				
	.050 (.022, .024)*	.055 (.017, .001)*	.032 (.011, .005)*	.038 (.010, .000)*
Birth-order (Child's Birth-order)				
	.284 (.262, .278)	.212 (.176, .228)	-.047 (.138, .736)	-.022 (.110, .839)
Young siblings (Number of young siblings)				
	.582 (.296, .050)*	.149 (.235, .525)	-.005 (.171, .977)	-.066 (.145, .651)
Mother's literacy status (illiterate as reference)				
Literate	-3.178 (1.739, .068)**	.205 (1.273, .872)	-2.143 (.956, .025)*	.514 (.804, .523)
Mother's education (Complete years of formal education)				
	-.147 (.176, .102)	-.081 (.131, .137)	-.120 (.099, .108)	-.024 (.088, .084)**
Mother's working status (Not working reference)				
Working	-2.144 (.972, .027)*	-.414 (.730, .071)**	.533 (.504, .190)	.330 (.413, .124)
Father's literacy status (illiterate as reference)				
Literate	-2.333 (1.754, .184)	-.545 (1.207, .651)	-1.991 (1.124, .076)**	-.458 (.853, .592)
Father's education (Complete years of formal education)				
	-.063 (.161, .697)	-.078 (.117, .504)	-.195 (.089, .029)*	.032 (.076, .672)
Number of children (5-14 years) in household (less than or equal to 2 as reference)				
More than 2	-1.948 (1.138, .087)**	.579 (.926, .532)	.346 (.754, .647)	.425 (.596, .475)
Family system (Joint as reference)				
Nuclear	2.177 (1.135, .055)**	.564 (.655, .389)	-.709 (.448, .114)	.829 (.397, .037)*
Household economic status (Non-poor as reference)				
Poor	.964 (1.232, .434)	.039 (.983, .969)	-.123 (.660, .852)	.553 (.579, .339)
Living index (Household living condition index)				
	.259 (.279, .152)	-.158 (.215, .112)	-.254 (.163, .119)	-.196 (.131, .135)
Locality of the household (Rural as reference)				
Urban	.376 (.978, .701)	-1.459 (.753, .053)**	.009 (.618, .988)	-.077 (.518, .882)
Constant	-12.360 (4.190, .003)*	-7.959 (2.751, .004)*	-4.334 (1.848, .019)*	-5.731 (1.542, .000)**

Note: * and ** represent the 5 and 10 percent level of significance respectively.

The results of the current study have shown that the risk of malnutrition (stunting and wasting) rises by increase in age of the child for both male and female children (See also (Khan and Azid, 2011) for Pakistan). The explanation may be that older children get less attention and care by parents. Furthermore inadequate food and medical-care is left for them due to high expenditures on young siblings' food and care. The parents', particularly of mothers', attention diverts to younger ones as they need more attention. However, the coefficient is more elastic for male as compared to female children. It explains that male children are more likely to be stunted and wasted as compared to female children by increase in age. In the socio-cultural context of Pakistan the explanation may be that female children help their mothers in domestic responsibilities and home-management. By increase in age they become able to take care of themselves. They are less likely to exposure to out of home environment and consequently less likely to be injured and ill. On the other hand, with the increase in age, the male children in the age group of 5-14 years are more likely to come in contact with contaminated environment including food as a result of increased exposure to outdoor environment.

Table-3. Percentage Estimates of Malnutrition in Male and Female Children

Background Characteristics	Male		Female	
	［Stunting］ Height-for-Age	**［Wasting］ Weight-for-Age**	**［Stunting］ Height-for-Age**	**［Wasting］ Weight-for-Age**
Child's age in months				
≤ 84	0	0	3.4	20.2
85-108	8.1	5.4	12.7	10.1
109-132	9.8	14.8	17.4	36.2
133-168	17.2	34.5	29.6	44.4
Child's Birth-order				
≤ 2	9.1	12.7	16.2	21.6
3-4	13.0	16.7	16.5	31.6
≥ 5	6.9	17.2	11.8	19.6
Number of young siblings				
No young siblings	3.6	7.1	14.0	20.9
1-3	10.3	17.5	16.3	28.7
≥ 4	23.1	15.4	12.5	15.6
Mother's literacy status				
Illiterate	8.5	17.0	11.9	22.6
Literate	5.0	14.4	7.5	16.7
Mother's education (Years of formal education)				
Primary	10.9	19.4	15.0	24.3
Middle	0	10.0	15.3	20.0
Secondary and intermediate	6.5	6,5	12.7	13.3
Collage or higher	6.7	5.7	11.0	10.0
Mother's working status				
Housewife	7.9	14.0	14.5	23.0
Working	20.8	20.8	17.3	30.8
Father's literacy status				
Illiterate	16.7	25.0	11.4	22.9
Literate	8.8	13.2	16.0	25.4
Father's education (Years of formal education)				
Primary	19.0	26.2	11.9	23.9
Middle	20.0	40.0	14.3	21.4
Secondary and intermediate	2.2	4.4	11.1	25.9
Collage or higher	8.7	13.0	21.7	26.1
Number of children (5-15 years) in household				
≤ 2	13.0	13.0	12.0	24.0
> 2	9.6	15.7	15.6	25.1
Family system				
Joint	4.9	12.2	19.2	16.7
Nuclear	12.4	16.5	12.7	30.2
Household economic status				
Non-Poor	7.8	11.7	16.7	25.6
Poor	13.1	19.7	14.0	24.6
Living Index (Household living condition index)				
Poor (1-3)	15.8	26.3	11.5	23.1
Middle (4-6)	7.3	12.7	18.0	26.2
Rich (7-9)	10.9	14.1	10.7	23.2
Locality of the household				
Rural	20.0	40.0	13.0	24.7
Urban	8.9	12.2	16.5	25.2
Total	10.1	15.2	15.2	25.0

They are more likely to go to the market, recreation places and get involved in the harmful habits like smoking. It leads to increased probability of malnutrition by increase in age.

4.2. Child's Birth-Order

In the literature some of the studies have found significant relationship between child's birth-order and allocation of resources among children. The first born child has higher level of intelligence and cognitive ability than later born siblings because greater investment is available for first child ((Khan and Azid, 2011) for Pakistan). There is some evidence that children with higher birth-order have greater probability to be malnourished (Ukwuani and Suchindran, 2003). Gender plays an important role in the effect of birth-order on nutritional outcomes. For example, in a pro-male society, early born male child may receive preferential treatment while later born female children may face greater neglect. The presence and extent of gender discrimination in nutritional status of children depend to a considerable extent on the birth-order of the child (Mishra *et al.*, 2004). Our results have shown that probability of malnutrition (stunted and wasted) has no significant relationship with birth-order of male and female children. The explanation may be that the presence of gender discrimination in effect of birth-order on malnutrition depends on sex composition of older living siblings. Discrimination against female children may be most visible in households where there are no living sons. On the other hand male children may be discriminated in the households where there are no daughters. Such cases are a small fraction of all children. Discrimination against female children where male children are in short supply and discrimination against male children where female children are in short supply may cancel the effect of each other. It supports the assumption that households desire balanced composition of male and female children.

4.3. Young Siblings

It is hypothesized that number of children in the household affects the nutritional status of male and female children differently. Our results have shown that the number of young siblings in the household enhance the probability of stunting in male children only. The effect of higher number of young siblings on nutritional status of male children is in the long-run. It may be explained as increase in young siblings in household diverts the mother's attention and less care remains available to the older children. The percentage estimates have shown that percentage of male children being stunted with no young siblings is 3.6 and for more than 4 young siblings is 23.1. It confirms the findings of Mishra *et al.* (2004) showing that discrimination against female children is not across the board but it depends to a considerable extent on the sex composition of living siblings. It also corroborates the findings for South Asia that mortality trends are higher among female children in families with larger number of older female siblings (Arnold *et al.*, 1998). There is further evidence that despite an overall preference for sons most couples desire to have at least one daughter (Arnold *et al.*, 2002). These statistics suggest that discrimination

against female children in feeding, treatment, and care is likely to depend in part on the number and sex composition of living children.

4.4. Mother's Education

The mother's education may play an important role in nutritional status of children. In Pakistan bringing the mother's education up to primary level may reduce wasting by 6.8 percent (Garcia and Alderman, 1989). The health status of children whose mothers are illiterate remains worse than those children, whose mothers have primary level of education in Uganda (Wamani *et al.*, 2004). It may be due to the improved health practices of educated mothers related with child health-care and feeding. On the other hand, there are evidences that mother's education negatively affects the child's health and growth (Ukwuani and Suchindran, 2003; Mbuya *et al.*, 2010). Mozambique is the country where the children of mothers with secondary or higher education are more wasted than children of less-educated mothers (Mukuria *et al.*, 2005). Similarly, it is also evidenced that prevalence of underweight, stunting and wasting has no influence of mother's education in Vietnam and Bangladesh (Choudhury *et al.*, 2000; Hien and Hoa, 2009). However, several researchers argued that mothers prefer daughters and fathers prefer sons. It is expected that mother's education has a larger impact on her daughter's nutritional status and father's education has a larger impact on his son's nutritional status.

To estimate the effect of mother's education on nutritional status of male and female children we have included in our analysis two types of variables regarding mother's education, i.e. mother's education as a continuous variable in the form of completed years of formal education and literacy status of mothers in the form of binary variable. Our results have shown that mother's education as a continuous variable slides down the malnutrition (wasting) in female children only. The mother's education as a binary variable diminishes the malnutrition (stunting) in male as well as female children. However, the effect is more elastic for male children. It makes the gender aspect of mother's education for nutritional status of children neutral. However, mother's education imparts a significant role in children's nutritional status. It is supported by the studies (Sahn and Younger, 2005). The explanation is based on the fact that educated women marry late than illiterate ones. It enhances the awareness and empowerment of women. Educated women have higher child spacing and fewer children, and give better child health-care and medical attention (Mukherjee *et al.*, 2008). The women's knowledge of nutritional benefits of different foods and their ability to redirect resources towards the purchase of hygienic food and nutritious diet contributes to save the children from malnutrition (Khan and Azid, 2011). The educated mothers have higher probability to seek proper and timely medical care for their children, which reduces the morbidity. The further explanation may be that educated mothers may attach a high value to children' nutritional status, and may have greater decision-making power, may have greater confidence in dealing with health service providers for children. They may have more exposure to mass media and may be more willing to travel outside the house for the purpose. It indicates the desirability of increased to emphasis on female education.

4.5. Mother's Working Status

Theoretically the mother's work status may affect the nutritional status of children positively or negatively depending upon the income earned by the women, formal and informal sector work, time allocated for child bearing and rearing along with the age of child. All types of evidence exist in literature. However, how much the male and female children are differently affected by the work status of women depends upon the attitude and behavior of the working women and allocation of resources earned by working women among male and female children.

The enough earned income by the woman to support the household budget for child's nutrition and health-care along with provision of proper time for child rearing enhance the nutritional status of children (Pande, 2003). On the other hand, chances of increase in malnutrition due to working status of mother in low income quintiles has also been evidenced in literature. These women are mostly engaged in informal sector and work for survival of their families, bearing the burden of domestic tasks and child-care. Sometimes they have to forego time devoted to child-care as opportunity cost of their economic activities. (Hien and Hoa, 2009) for Vietnam) concluded that children of farmer mothers were significantly more underweight and stunted. It may be due to poverty and poor knowledge of farmer mothers or paying less attention to their children because of their high work load. In India the incidence of wasting was higher for those children whose mothers were working (Mukherjee *et al.*, 2008). However, in Nigeria mother's working status negatively affects the child health during infancy and positively in childhood, which may be due to lesser time for infants as required but enhanced family income contributed by working mother for childhood (Ukwuani and Suchindran, 2003). In growing economies employment opportunities for women are increasing. They are engaged in work outside the home to earn an income that is considered an indicator of their autonomy and command over allocation of resources. It measures the social and economic environment in which women's gender preferences and discriminatory behavior occur (Mason, 1994). How it affects the male and female children is an enigma. In our analysis mother's working status positively affects the nutritional status of male children. The working status of woman reduces the malnutrition (stunting as well as wasting) in male children only. It represents the gender biased effect of working status of mothers on nutritional status of children.

4.6. Father's Education

We have included two types of variables to capture the effect of father's education on nutritional status of male and female children. First is the completed years of formal education as a continuous variable and second one is the binary variable, i.e. whether the father is literate or illiterate. Father's education as a continuous variable as well as binary variable decreases the malnutrition (stunting only) in female children only. If we make a comparison of father and mother's effect of education on nutritional status of male and female children it is clear that mother's education is more effective as it decreases malnutrition in both male and female children as compared to father's education. It is supported by the results of Christiansen and Alderman (2004) showing that positive impacts of mother's education on children health is about twice as

large as that of father's education. However, in our results father's education is advantageous for female children only.

4.7. Number of Children in the Household

Conceptually the number of children in the household affects the nutritional status of children negatively. Khan and Azid (2011) for Pakistan) found that the risk of malnutrition in children increases in urban and slum households with enhanced number of children. For Bangladesh severe malnutrition was evidenced in households with larger number of siblings (Choudhury *et al.*, 2000). The core reason is that mothers cannot take adequate care of large number of children that increases the risk of malnutrition. But in literature results are not consistent. Children form families with larger number of children are less likely to be stunted in Tanzania and Zambia (Giroux, 2008). The reason may be that the children under 15 years who are employed help in improving the welfare of household and nutritional status of the household. The gender aspect of nutritional status of children is linked with larger number of children. The larger number of children in the household means increase in number of dependents in the household. It may affect the allocation of scarce food among male and female children.

Similarly the care-time given by the mothers to children may become gender biased due to limited time available for child-care. Our results have shown that number of children (more than 2) in the age group of 5-15 years in the household has negative effect on stunting among male children only. In other words the risk of malnutrition (stunting that is a long-run nutritional indicator) declines among male children with the increase in number of children in household. The literature has explained that in poor families, if the children in the household are employed, nutritional status of household may be improved.

4.8. Family System

The family system is defined whether the child is living in combined family, i.e. household having members as husband, children and other relatives or the child is living in nuclear family. The literature suggests that the variable may be associated with gender differences in child's nutritional status. The variable is primarily an indicator of woman's social autonomy in the household. Woman's low autonomy can influence both gender preferences and discriminatory behavior against female children. In Mosley and Chen (1984) framework, woman's autonomy would correspond to the individual level distal determinants of decision-making. It is hypothesized that children from nuclear family system are more likely to be well-nourished based on the fact that the moderate norms and values in nuclear household represents that mothers are more empowered than the mothers of joint families. On the other hand combined family system and nuclear family system have specific household economics. In the combined family system more household members are present for caring the children along with pooling the household budget. In the nuclear family system possibility is lesser care of the children and lesser pooling ratio in household budget. In this perspective the children from combined family system may be more likely to be well-nourished. The household economics is also relevant with gender aspect of

the nutritional status of children. The households with lower economic status are assumed to discriminate the female children due to scarcity of resources. Our analysis has shown that the risk of being stunted in male children and wasting in female children is positively related with nuclear family system (see also, (Pande, 2003)). In nuclear families male children as well as female children get disadvantages in nutritional intakes due to lesser pool of income from comparatively lesser number of household members. The results are corroborated with the results of current analysis for the variable of number of children (5-14) in the household. The explanation may be that children in combined family have a beneficial impact of presence of multiple care takers in these households.

4.9. Household Economic Status and Living Condition

In the literature there are evidences that children from low socioeconomic background living in poor houses with unhygienic standards, poor sanitary conditions, unsafe drinking water are more prevalent to malnutrition (Mondal *et al.*, 2012). The effect of the socioeconomic status on gender differences in nutrition is influenced by the household's ability and access to resources to realize their preferences. However, in our estimation the living condition index and economic status of household have shown no significant effect on nutritional status of male as well as male children.

4.10. Locality of Household

Theoretically and some empirical evidences have explained that children from urban households have higher level of nutritional status as compared to those from rural households. It is based on the fact that urban households have good socioeconomic status and may avail fine health facilities. Although some studies have shown no significant relationship between health status of children and area of residence (Bourne, 2009). As for as the gender of child is concerned, it is hypothesized that rural areas aggravate the gender discrimination due to strong social and cultural norms. Moreover, the resource constraint to the households in rural areas is prevalent, it is associated with gender aspect of the child regarding nutritional status. The rural female children may face more discrimination as compared to urban female children. The access to media and literacy status is also low in rural areas which may enhance the gender discrimination in rural households. Our results revealed that locality of the household in urban areas negatively affects the malnutrition (wasting) of male children. It shows that urban male children are less likely to be malnourished as compared to rural male children. However, locality of the household remained ineffective for nutritional status of female children. It shows that locality effect is only for male children. From the results it may be inferred that children are at disadvantage in the perspective of locality of the household. The urban locality supports only male children not the female ones.

5. CONCLUSION AND RECOMMENDATIONS

The empirical evidence from this study has several implications for gender discrimination in nutritional status of children in Pakistan. The gender differences in the perspective of impact of

socioeconomic factors on nutritional status of children are pronounced in Pakistan. Though the study is micro-study the research may be generalized but the validated studies are required using larger sample sizes among diverse regions. The findings of our study have important implications for public health policy makers, planners and organizations seeking to meet national and international targets. Of paramount importance is not only to increase the food given to children but also to promote gender equality. For the purpose decrease in the number of offspring enhancement of paternal education along with poverty alleviation may work in a positive way. Such measures would result in decreasing rate of malnutrition in children, particularly among female children. In our results education of the mother has proved to be a significant variable in largely reducing the probability of malnourishment among children of both sexes. So maternal education should be a part of policy formulation for decreasing the discrimination in nutritional status of children.

REFERENCES

Alderman, H. and P. Gartler, 1997. Family resources and gender differences in human capital investment: The demand for children's medical-care in Pakistan. In Haddad, L., J. Hoddinott and H. Alderman (Eds). International resource allocation in developing countries: Models, methods and policy. Baltimore: John Hopkin Univeristy Press.

Arnold, F., M.K. Choe and T.K. Roy, 1998. Son preference, the family-building process and child mortality in India. Population Studies, 52(3): 301-315.

Arnold, F., S. Kishor and T.K. Roy, 2002. Sex-selective abortions in India. Population and Development Review, 28(4): 1-28.

Aturupane, H., A.B. Deolalikar and D. Gunewardena, 2008. The determinants of child weight and height in Sri Lanka: A qualitative regression approach. Research Paper No. 2008/53. UNU-WIDER.

Basu, A.M., 1993. How pervasive are sex differentials in childhood nutritional levels in South Asia?. Social Biology, 40(1-2): 25-37.

Biswas, S.C., M.A. Darda and M.F. Aslam, 2001. Factors affecting childhood immunization in Bangladesh. Pakistan Development Review, 40(1): 57-70.

Bourne, P.A., 2009. Childhood health in Jamaica: Changing patterns in health conditions of children 0-14 years. North American Journal of Medical Science, 1(4): 160-168.

Chen, L.A.K., M.A. Chowdhury and S.L. Huffman, 1980. Anthropometric assessment of energy-protein malnutrition and subsequent risk of mortality among pre-school aged children. American Journal of Clinical Nutrition, 33(8): 1836-1845.

Choudhury, K.K., M.A. Hanifi, S. Rasheed and A. Bhuiya, 2000. Gender inequality and severe malnutrition among children in a remote rural area of Bangladesh. Journal of Health, Population and Nutrition, 18(3): 123-130.

Christiansen, L. and H. Alderman, 2004. Child malnutrition in Ethiopia: Can maternal knowledge augment the role of income? Economic Development and Cultural Change, 52(2): 278-312.

DasGupta, M., 1987. Selective discrimination against female children in rural Punjab, India. Population and Development Review, 13(1): 77-100.

Garcia, M. and H. Alderman, 1989. Patterns and determinants of malnutrition in children in Pakistan: Impact of community health. Pakistan Development Review, 28(4): 891-902.

Giroux, S.C., 2008. Child stunting across schooling and fertility transitions: Evidence from Sub-Saharan Africa. Calverton, Maryland, USA: MACRO International.

Haddad, L., C. Pena, C. Nishida, A. Quisumging and A. Slack, 1996. Food security and nutrition implications of intrahousehold bias: A review of literature. FCND Discussion Paper No.9. Washington, D.C: International Food Policy Research Institute.

Hien, N.N. and N.N. Hoa, 2009. Nutritional status and determinants of malnutrition in children under three years of age in Nghean, Vietnam. Pakistan Journal of Nutrition, 8(7): 958-964.

Holmes, J., 2006. Do community factors have a differential impact on the health outcomes of boys and girls? Evidence from rural Pakistan. Health Policy Plan, 21(3): 231-240.

Khan, R.E.A., 2005. Gender discrimination in demand for child schooling. GCU Economics Journal, 37(1&2): 29-58.

Khan, R.E.A., 2005;2008. Gender discrimination in demand for child schooling. GCU Economics Journal, 37(1&2): 29-58.

Khan, R.E.A., 2008. Gender analysis of children activities in Pakistan. Pakistan Development Review, 47(2): 169-195.

Khan, R.E.A. and T. Azid, 2011. Malnutrition in primary school-age children: A case of urban and slum areas of Bahawalpur, Pakistan. International Journal of Social Economics, 38(9): 748-766.

Khan, R.E.A. and T. Khan, 2004. Economics of malnutrition in children. Journal of Educational Research, 7(1,2): 26-39.

King, E. and A. Mason, 2001. Engendering development through gender equality in rights, resources and voice. World Bank Policy Research Report. World Bank, Washington, D.C.

Kostermans, K., 1993. Assessing the quality of anthropometric data. Living standard measurement study No.101. Washington, D.C: World Bank.

Marcoux, A., 2002. Sex differentials in undernutrition: A look at survey evidence. Population and Development Review, 28(2): 275-284.

Mason, K.O., 1994. Conceptualizing and measuring women's status. Paper Presented at Annual Meeting of the Population. Association of America, May 5-7.

Mbuya, M.N.N., M. Chidem, B. Chasekwa and V. Mishra, 2010. Biological, social, and environmental determinants of low birth-weight and stunting among infants and young children in Zimbabwe. Calverton, Maryland, USA: Zimbabwe Working Papers.

Mehrotra, S., 2006. Child malnutrition and gender discrimination in South Asia. Economic and Political Weekly, 61(10): 912-918.

Mian, R.M.A., M. Ali, P.A. Ferroni and P. Underwood, 2002. The nutritional status of school-aged children in an urban squatter settlement in Pakistan. Pakistan Journal of Nutrition, 1(3): 121-123.

Mishra, V., S. Lahiri and N.Y. Luther, 1999. Child nutrition in India. National family health survey subject reports No. 14. Mumbai: International Institute for Population Sciences; and Honolulu: East-West Center Program on Population.

Mishra, V., T.K. Roy and R.D. Retherford, 2004. Sex differential in childhood feeding, health-care and nutritional status in India. East-West Center Working Papers. Population and Health Series, Paper No.113. East-West Center, Hawaii.

Mondal, P.R., S. Biswas and K. Bose, 2012. Gender discrimination in undernutrition with mediating factors among bengalee school children from Eastern India. HOMO Journal of Comparative Human Biology, 63(2): 126-135.

Mosley, W.H., 1985. Biological and socioeconomic determinants of child survival. A Proximate Determinants Framework Integrating Fertility and Mortality Variables. In International Union for the Scientific Study of Population (IUSSP). International Population Conference, Florence. Paris: IUSSP, 2:190-208.

Mosley, W.H. and L.C. Chen, 1984. An analytical framework for the study of child survival in developing countries. Population and Development Review, 10(1): 25-45.

Mozumder, A.B., K. Barket-E, T.T. Kane, A. Levin and S. Ahmed, 2000. The effect of birth interval on malnutrition in Bangladesh: Infants and young children. Journal of Biosocial Sciences, 32(4): 289-300.

Muhuri, P.K. and S.H. Preston, 1991. Effects of family composition on mortality differentials by sex among children in matlab Bangladesh. Population and Development Review, 17(3): 415-434.

Mukherjee, R.M., L.C.S. Chaturveedi and C.R. Bhalwar, 2008. Determinants of nutritional status of school children. Malnutrition Military Journal of Armed Forces, India, 4(3): 227-231.

Mukuria, A., J. Cushing and J. Sangha, 2005. Nutritional status of children: Results from the demographic and health surveys 1994-2001. Calverton, Maryland, USA: ORC Macro.

Pande, R.P., 2003. Selective gender differences in childhood nutrition and immunization in rural India: The role of siblings. Demography, 40(3): 595-418.

Ravindaran, T.K.S. and U.S. Mishra, 2000. Health consequences of gender-based discrimination in childhood: A review of recent evidence. Paper Presented at the WHO Meeting on Gender Analysis for Health, Geneva, 28-30, June.

Sahn, D.E. and S.D. Younger, 2005. Improvements in children's health: Does inequality matter. Journal of Economic Inequality, 3(2): 125-143.

Ukwuani, F.A. and C.M. Suchindran, 2003. Implications of women's work for child nutritional status in Sub-Saharan Africa: A case study of Nigeria. Social Science & Medicine, 56(10): 2109-2121.

UNDP, 2000. Human development report 2000: Human rights and human development. Published for United Nations development program. New York: Oxford University Press.

Visaria, L. and P. Visaria, 1995. India's population in ttransition. Population Bulletin, 50(3): 1-51.

Wamani, H., T. Tylleskar, A.N. Astrom, J.K. Tumwine and S. Peterson, 2004. Mothers' education but not fathers education, household assets or land ownership is the best predictor of child health inequalities in rural Uganda. International Journal for Equity in Health, 3(1): 9.

World Bank, 2002. Pakistan poverty assessment. Poverty in Pakistan: Vulnerability, social gaps and rural dynamics. Report No. 2429. PAK. The World Bank, Washington, D.C.

World Bank, 2005. Pakistan country gender assessment report: Bridging the gap, opportunities and challenges. Report No. 32244-PAK. Environment and Social Development Sector Unit. South Asia Region. World Bank, Washington, D.C.