Women's Decision Making Autonomy and its Influence on Nutritional Health in India: A North-South Regional Comparison

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ABSTRACT

The main aim of this study is to explore the effect of women's household decision making autonomy on their own and their children's nutritional status using unit level data from National Family Health Survey (NFHS3) conducted by IIPS in the year 2005-06 in India. The paper also attempts to answer the concerning factors through which women's autonomy operates. It also compares the results between north and south zones in India. The analysis is restricted to 11888 married, non pregnant women aged 15-49 years who had at least one birth within five years preceding the survey. Findings of the study indicate that women's education, job categories and household economic position play important role in the household decision making autonomy and in turn, it affects nutritional status of the family members, especially of self and children. Regression analysis confirms that women with low autonomy are more likely (Odd Ratio (OR) = 1.336 in north and 1.382 in south) to be underweight than those of high decision making autonomy group. Similarly, stunted children are significantly more common (OR = 1.236 in north and 1.199 in south) in the low decision making autonomy group compared to the high autonomy group. It is thus concluded that women's decision making autonomy is an important determinant towards nutritional status in India. Considering north-south difference it is found that the proportion of women's autonomy in south region is high (23.6%) compared to north (18.8%). It is also evident from

the study that nutritional status of children is poor in north region compared to south region. Therefore, intervention should be required to uplift women's position in the society in one hand and uniform medical infrastructure on the other.

INTRODUCTION

Women's autonomy has been defined and measured differently by different authors. Autonomy means power in the hands of self. Thus, women's autonomy means control of women over their own life's decisions that include education, child-care, marriage, food etc. It has a multidimensional entity that refers to different aspects of women's lives. The dictionary term of autonomy is independence in one's thoughts and actions. A number of scholars have shown that increased women's autonomy directly helps to increase the welfare of their children and the household in total (Black et al 2008, Shroff et al 2009).

Studies have shown that while men tend to make investments on themselves and overall worth of their households, women are more likely to invest in basic food and health care needs of the children (Engle 1993, Roushdy 2004). This raises the question of how important women's abilities to control household and societal resources are to the health and well-being of their children. More recently, research has also begun to examine the role that women's autonomy might play in determining the health and well-being of women and their children. Scholars like Mukherjee (2013), finds that in India, women's autonomy increases children's well being although there remains a gender bias towards boys. Women's autonomy in health care decision making is extremely important for child health as it reduces chances of gender-based inequalities. A study in India shows (Shroff et al 2011) that mothers with higher participation in household decision making has infants that are less underweight and less wasted. It suggests that improvement of maternal, financial and household decision making autonomy could have a positive influence on feeding and growth outcomes. In India, the problems regarding health when looked at from gender point of view is much worse (Dinesha et al 2008). A number of Studies focusing on the aspects of gender and child health and nutrition have found links between women's status and child survival, showing that children benefit when the mother's status is raised (Heaton et al 2005, Smith and Haddad 2000).

Nutrition is one of the essential determinants of health. Malnutrition affects one out of every three preschool children in developing countries (Smith et al 2002). This disturbing, yet preventable, state of affairs causes' untold suffering and creates a major obstacle to the development process. In India and some other developing countries, women enjoy little independence as women's position is subordinate to that of men in various household decision making matters. This is manifested through gender roles, unequal power relations in various household decision making aspects, which, in turn, creates a large number of health problems, both for children and women. In India, regional variation is high due to unequal social, cultural and economic development. With few exceptions, India bears a strong patriarchy and this patriarchal structure and power unevenness actually limit women's

autonomy and decision making power in every sphere of life. Women's access to health care is a complex issue - as it is both the outcome of women's status in the society, including society's response to their health needs, and a determinant of women's health and productivity and, ultimately, of their status (Chatterjee, 1990). Study of Bloom et al (2001) in a north Indian city has highlighted that women's greater autonomy on physical movement helps to take higher levels of antenatal care and more likely to use safe delivery care. In another study in rural north India (Self and Grabowski 2013), impact of social, economic and political factors on female autonomy are also observed. In Andhra Pradesh, South India, Shroff (2007) has shown that women's autonomy in financial independence and flexible mobility have an influence on child nutritional status. Maternal autonomy is inversely related to child stunting as shown by Shroff et al (2009) taking data of Andhra Pradesh, India. It is also evident that women, who have lower levels of autonomy and status within the household, are more likely to experience under nutrition (Hindin 2000) or have a lower BMI (Bindon and Vitzthum 2002) of their own. Anaemia is the most common nutritional disease and a major public health problem of women in India and more so in the rural belt, that mostly affects the women of reproductive age. Iron deficient anaemia is the most frequently occurring nutritional disorder worldwide (Killip et al 2007) and is affecting almost all physiological groups, especially preschool children, pregnant women and lactating mothers (WHO 2002). The role of women's social status in determining their children's nutritional health has gone largely unnoticed for a long time. The present study tries to link between women's household decision making autonomy and its relation with nutritional health for themselves and their children in India. Moreover, the study will look into the north-south regional difference in the health status due to regional disparity in the customs, habits, etc. The main objectives of the study are:

1) to see women decision making autonomy at the household level by identifying the factors that affect them,

2) to see a relation with mother and child health,

3) to notice the relationship between autonomy and maternal and child health status, and

4) to see an overall comparison between north and south regions of the country.

METHODOLOGY

The present set of data is taken from National Family Health Survey-3 (NFHS-3) which was conducted by International Institute of Population Sciences (IIPS), Mumbai, in collaboration with the Ministry of Health and Family Welfare, during the year of 2005-06 in India. The study was conducted among the women of reproductive age (15-49) having at least one living child five years preceding the survey. The sample size is 11888 non-pregnant women. The study has taken only the last living child. The factors that have been taken here are residence pattern, mother's education and occupation, mother's age, wealth index (as a proxy to

household economic status), religion and ethnicity. Wealth index were generated on the basis of some household assets and evolved by IIPS as 'poorest', 'poorer', 'middle', 'richer' and 'richest'. In this study wealth index categories were grouped as 'poor', 'middle' and 'rich'. Apart from social, economic, and demographic factors, regional variation is also considered. In India, wide regional variations are observed in maternal and child health status. More specifically, north-south regional variation exists due to strong patriarchy with rigid norms and values, different kinship, marriage and inheritance pattern. Not only pattern; differences in the development indicators also create differences between north south regions. Chronic Energy deficiency of the women (measured through BMI) and anaemic condition of the women are directly linked to the child health. BMI categories as defined by WHO (2005) are < 18.50 kg/m^2, 18.50-24.99 kg/m^2 and >=25.00 kg/m^2 being termed as 'underweight', 'normal' and 'overweight or obese' respectively. For anaemia, women haemoglobin level < 7.0 g/dl is termed as severe, 7.0-9.9g/dl as moderate, 10.0-11.9g/dl as mild and >=12.0g/dl is considered as non-anaemic or normal. Evaluation of nutritional status is based on the rationale that in a well-nourished population, there is a statistically predictable distribution of children of a given age with respect to height and weight. The standard indices of physical growth that describe the nutritional status of children are Height-for-age (HAZ), Weight- for-age (WAZ) and Weight-for-height (WHZ). Children, whose Z-score for the above is below minus two standard deviations (-2SD) from the median of the reference population, are considered stunted for HAZ, underweight for WAZ and wasted for WHZ and are chronically malnourished. Women decision index was generated through some decision making status in the family. These are 'own health care', 'large household purchase', 'purchase in daily needs', 'visit to friends/relatives' and 'control on husband's earnings'. Each item was weighted '0' for no involvement of the women, '1' for decision with others and '2' for decision alone. Thus, a sum of scores was obtained. The score varies from 0-10 (where minimum value 0 and maximum 10). Autonomy index was grouped as low (0-2), medium (3-5) and high (6-10). For toilet facilities, flush toilet is considered as safe and others as unsafe. For drinking sources, piped water, and tube well or protected well are grouped as safe sources. Data are analyzed in two levels, first by proportion test and in the second through categorical binary logistic regression model. For regression analysis, height for age, weight for age and weight for height are taken as dependent variable, where the binary value '1' is considered for underweight, stunted or wasted category depending upon the type of the depended variable considered in the regression. The value '0' is taken if it is absent. Women with BMI <18.5wt/ht^2 or anaemic women are given the value '1'. For regression, odd ratio >1 indicates probability of being wasted or stunted or underweight is higher than the reference category and if it is <1, then the result is just the reverse i.e. probability is lower than the reference category and if odds are close to 1, then no difference from reference category is observed. The explanation is same for women's underweight and anaemia also. Statistical analysis is being done by SPSS 16.0 version. P value <0.05 is considered as significant.

RESULTS

Table 1 is a comparative analysis of the North and South zone with reference to certain independent characteristics. It **is** seen that the percentage of illiterate mothers is 42.7% in north zone whereas it is only 22.6 % in south region. It is found that in the North 36.5% and in the South 52.2% women have passed the secondary level of education. In the case of higher education, the scenario is similar (11.3% in south zone as against 8.8% in the north zone). On the occupational front, it **is found** that both the zones have a high percentage involved in domestic work. Women involved in agriculture are higher in the North zone (21.3%) than in the South zone (15.1%). In the south region**,** both the service/professional and the labour categories show a higher percentage compared to the north region. North zone has a higher percentage of women residing in the rural sector and thus also have a higher percentage of unsafe toilet and drinking facilities as compared to the South zone. The wealth index pattern between the two zones clearly shows that the North zone has a higher percentage of poorest and richest categories when considered wealth index. The percentage of Christians in the South is higher than in the North while the Hindus can be seen spread across the country. Other religions are higher in the north zone whereas Muslims are higher in the south zone (17.5% compared to 12.3% in North). From the health point of view, it **is observed** that North zone has more underweight women (31.9%) than South zone (28.4%). When mother's anaemia levels are considered, it is found that the anaemic women whether severe or moderate, is higher in the north zone compared to the south zone. Relating to child health status, north zone has more stunted (41.4%), underweight (34.4%) and wasted children (17.5%) than south zone. Women's high autonomy is seen to be sharply lower in the north zone with 18.8% than in the south with 23.6% women.

Table 2 is a comparison between the above stated characteristics with the varying degrees of autonomy for women. A clear trend **is seen when** comparing autonomy levels with education levels. As education**al** level increases**,** the percentage of low autonomy decreases (from 44.9% to 22.2% in the north zone and from 39.5% to 15.3% in the south zone) and the percentages of high autonomy increases (from 16.4% to 28.0% in the north zone and from 20.6% to 28.6% in the south zone) for both the north and the south zones. Though trend is similar for both the zones but the degree of happenings differs each other. Considering women occupation, proportion of high autonomy is found among the women of not-working/domestic service followed by labour categories for both the zones. Percentage of low autonomy decreases and high autonomy increases as mother's age increases. There are rural urban differences also, urban sector having higher share of high autonomy mothers. The same trend is maintained in case of wealth index. There is the maximum number of high autonomy mothers among Christians. Social groups however do not show any sharp visible trend. When we compare between north and south zone we observe that the percentages of high autonomy mothers are uniformly more in the south zone regardless whether it is grouped

using mothers' education, occupation, age, place of residence or wealth index. The only exceptions are among Christians or when it is categorized using social group (i.e. SC, ST, Other Backward Classes & Others groups).

Table 3a shows the relation of mother's health with that of their children's health. It is noticed from the table that along with the increase of women's BMI, child malnutrition decreases in terms of stunting (HAZ), underweight (WAZ) and for wasting (WHZ). It indicates that mothers with good health have a positive move towards good child health. The table also highlight that underweight mothers have a higher risk of having chance of 47.3% stunted, 44.2% underweight and 22.5% wasted child for north zone and for south zone the result is 43.2%, 41.0% and 21.2% respectively. The result shows quite similarity in case of mother's anaemia also. Significance test is done through chi-square.

Influence of child and women health with respect to women's autonomy is shown in Table 3b, 3c. Table shows a positive trend towards autonomy and health. Women with high autonomy have a lower risk (37.7% for north zone and 33.7% for south zone) of stunted (HAZ) child for both the zones. For underweight (WAZ) and wasted (WHZ), women's autonomy does not show any clear result. Considering women health, autonomy shows a reducing trend for underweight, but does not show any difference in anaemia for both the zones. Only women of medium level autonomy index group in the south zone are comparatively low anaemic compared to high autonomy group.

Table 4a is an analysis where the influence of independent factors on mother's health is shown comparing the north and south zone. Illiterate mothers of both the zones are highly anaemic (60.5% & 61.8%) and underweight (38.1% & 42.1%). It is seen that the cases of underweight women decrease (11.3% & 10.1%) with the increases of education. Housewives and labourers of both the zones are more anaemic and underweight than the women engaged in professional work. More cases of anaemia are registered for age groups 15-19, 20-24 in both the zones and 40 and above for south zone only. Rural India has a great percentage of anaemic women (57.6% & 55.2%). The poor section of both the north and south zones are not only highly anaemic but are also underweight (43.3% & 47.7%). Underweight decreases with the increase in wealth index as shown in Table 4a. Christian women residing in north zone are severely anaemic (73.7%) as compared to those living in south zone (42.4%). 35.3 percent of Muslim women from North India are underweight while only 17.8% are underweight in South India. STs of both zones are highly anaemic (67.2% & 61.2%). No regional difference in anaemia is observed in General category. It can be seen that unsafe drinking water and unhygienic toilet facilities cause to a higher percentage of anaemic women.

Table 4b compares the various characteristics with the health status of children in the north and the south India. It is observed that a higher percentage of stunted (51.1% & 49.7%), underweight (44.4% & 43.2%) and wasted (20.5% & 19.2%) children are born to illiterate mothers as compared to those who have finished higher education. Women involved in labour work usually give-birth more stunted children. Early motherhood can be seen to be the reason behind the high percentage of stunted children in north and south India. Less resources or poor wealth index is also responsible for stunted and underweight children. One may notice that the percentages of HAZ, WAZ and WHZ children are more in North India for most of the socio-demographic characters.

Association of women and child health with respect to women's autonomy are analysed through regression analysis in Table 5a and 5b. For child health, analysis indicates that stunted condition of the child is significantly high among low and middle autonomy group compared to high autonomy in north and south zone (Table 5a). The odds ratio is significantly higher (1.235 for low autonomy and 1.156 for medium autonomy) compared to high autonomy index group for north zone. For south zone, table shows the odd ratio for low autonomy is 1.199 with respect to reference category of high autonomy. The Table 5b shows that underweight women are significantly higher among the women of low autonomy group (Odds ratio is 1.336 with Confidence interval 1.155-1.545 for north zone and Odds ratio is 1.382 with Confidence interval 1.172-1.630 for south zone) compared to higher autonomy group. For women anaemia, medium autonomy also has a significant odds-ratio in south zone.

DISCUSSION

In this study, the degree of women's autonomy is defined by an index which combines various decision making powers. The association of women's autonomy with health is examined using data from National Family Health Survey-3 in the period of 2005-06. Percentage distribution shows that the levels of women's and child's health are higher among the women of high autonomy in both the zones, obviously with better results being in the south zone.

Mothers, as primary caretakers, are more concerned about child's health needs and it is their position in the family that translates into their decision-making authority so far as access to health care is concerned. Issues of day-to-day resource allocation, such as buying special foods for infants, use of emergency care or preventive care for the child and herself, reflect the women's authority within the household. It can be clearly seen that underweight or anaemic mothers give birth to undernourished offspring. Undernutrition may lead to increased numbers of stunted, underweight and wasted children. Undernutrition may also lead to child mortality, though it is not seen in this study. The result shows that there is a significant relation between women's autonomy and child health especially in case of

stunting, a chronic malnutrition. In this case, the odds are significantly higher in case of low and medium autonomy index group compared to high autonomy index category.

Women's education has relations with occupational status and her awareness towards child or own health. Thus, it will not possibly be wrong to say that women education plays a vital role in child's as well as their own health status. Women's higher decision-making autonomy shows higher BMI, so that lower risk of underweight for both the zones. Other autonomy related indirect factors such as place of residence, religion, hygienic condition (measured through use of drinking water and toilet facilities) and economic conditions of the households (measured through wealth index) also contribute to improving their own BMI and anaemia levels as well. These factors have a direct or indirect relation with child's health status as vaccination, recommended diet for the child, proper sanitation, etc., are all in the hands of mothers.

We have observed some differences in the health status between North and South India. South India is showing improved health status in many of the cases. What may explain these differences? One of the reasons is that the women residing in South India enjoy more or less a greater autonomy level as compared to those in the North. It turns out South zone has lesser cases of stunted (43.2%), underweight (41%) and wasted (21.2%) children compared to North region. It is documented that higher women's autonomy is significantly associated with post-neonatal survival of their children (Ghuman 2003, Hossain et al 2007). More autonomous women are likely to have greater freedom to take their children to health centres for immunizations and other preventive services, as well as curative services, which are likely to have a large impact on health and survival in the first year of life (Dancer et al 2008, Bharati et al 2014). Our study shows that women's autonomy also has a good relation with women and child health and women education and household economic status (Table not shown here) play a significant role in the determination of health status. These findings corroborate with some previous studies (Koenenet al, 2006) which tinted that women's autonomy is an important measure of maternal and child health status. The explanatory variables that accelerate the autonomy are higher education and better household economic position (wealth index) which actually determines the women's position in the family and minimize the risk of health both for them and their children. Mother's occupations though have a role in health status are indirectly related to education of mother assuming that education gives better opportunity in occupational sector.

This being said, the study has limitations. First, the study was restricted to women belonging to reproductive age with at least one living child under the age of 5 years. Second, the decision-making factors can be seen to fluctuate due to various socio-economic factors. Third, autonomy being multidimensional, keeps changing in different situations.

To conclude, this research finds that autonomy is a critical variable in understanding maternal and child health, as gender bias in autonomy often affects the health and well-being of mothers and children. The result highlights the centrality of women's decision-making power and how it is different in the two zones of the country, due to difference in availability of resources and opportunity. But it should be kept in mind that lower autonomy of women is not the only reason behind the degrading health status of mothers and children. Intervention is required at the society level as well, so as to uplift the status of women, and allow them to be more vocal with their family issues. At the health front, noticeable changes are also expectedly seen when the medical infrastructure is improved.

REFERENCES

Bharati S, Pal M and Bharati P. 2014. Women's autonomy, nutritional and immunization status of their children. Anthropol. 2(2). 118. Doi:10.4172/2332-0915.1000118.

Bindon JR and Vitzthum VJ. 2002. Household economic strategies and nutritional anthropometry of women in American Samoa and highland Bolivia. Social Science and Medicine. 54(8): 1299-1308.

Black RE, Allen LH,Bhutta ZA, CaulfieldLE, de Onis M, Ezzati M. Mathers C, Rivera J. 2008. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet. 371(9608): 243-260.

Bloom, S.S., D. Wypij, and M. Das Gupta. 2001. "Dimensions of Women's Autonomy and the Influence on Maternal Health Care Utilization in a North Indian City." Demography 38(1):67-78.

Chatterjee M. 1990. Indian Women: Their Health and Economic Productivity, World Bank Discussion Papers 109, Washington, DC.

Dancer D, Rammohan A and Smith MD. 2008. Infant mortality and child nutrition in Bangladesh. Health Econ. 17(9):1015-1035.

Dinesha PT, Jayasheela H and Hans VB. 2008. Health infrastructure in India: Agenda for the new millennium (Paper read at the National Seminar on Infracture Development: Current Scenario and Futute Challenges). Department of Studies in Economics, Kuvempu University, Shimoga, Karnataka, India, February (15-16).

Engle PL. 1993. Influences of mothers' and fathers' income on children's nutritional status in Guatemala. Social Science and Medicine. 37(11):1303–1312.

Ghuman SJ. 2003. Women's autonomy and child survival: A comparison of Muslims and Non-Muslims in four Asian Countries. Demography, 40(3) : 419-436.

Heaton TB, Forste R, Hoffmann JP and Flake D. 2005. Cross-national variation in family influences on childhealth. Social Science and Medicine.;60(1):97-108.

Hindin MJ. 2000. Women's power and anthropometric status in Zimbabwe. Social Science and Medicine. 51(10):1517-1528.

Hossain MB, Phillips JP and Pence B. 2007. The effect of women's status on infant and child mortality in four rural areas of Bangladesh. Journal of .Biosocial. Science, 39(3): 355-366.

Killip S, Bennett JM and Chambers MD, 2007. Iron deficiency anemia. *American* Family Physician,75(*5)*: 671-678.

Koenen KC, Lincoln A and Appleton A. 2006. Women's status and child well-being: a state level analysis. Social Science and Medicine. 63(12): 2999-3012.

Mukherjee SS. 2013. Women's Empowerment and Gender Bias in the Birth and Survival of Girls in Urban India. Feminist Economics, 19(1): 1-28.

Roushdy R. Intrahousehold resource allocation in Egypt: does women's empowerment lead to greater investments in children? Population Council, West Africa and North Asia Region; 2004.

Self S and Grabowski R. 2013. Female autonomy in rural North India: Impact of economic, social and political factors. Journal of economic development. 38(1): 59-82.

Shroff MR, Griffiths PL, Suchindran C, Nagalla B, Vazir S and Bentley ME. 2011. Does maternal autonomy influence feeding practices and infant growth in rural India? Soc. Sci. Med. 73(3):447-455.

Shroff M, Griffiths P, Adair L, Suchindran C, Bentley M. 2009. Maternal autonomy is inversely related to child stunting in Andhra Pradesh, India. Matern Child Nutr.5(1):64-74.

Shroff MR. 2007. Child nutritional status, feeding practices and women's autonomy in rural Andhra Pradesh, India. Dissertation submitted to the University of North Carolina at Chapel Hill in the department of nutrition of school of public health.

Smith LC and Haddad LJ. 2000.Explaining Child Malnutrition in Developing Countries: A Cross-countryAnalysis. Washington, DC: International Food Policy Research Institute;

Smith LC, Ramakrishnan U, Ndiaye A, Haddad L andMartorell R. 2002. The importance of women's status for child nutrition in developing countries. Research report. International Food policy Research Institute.

WHO, 2002. The World Health Report: Reducing Risks, Promoting Healthy Life. Geneva: WHO

World Health Report 2005. 2005. Make every mother and child count. Geneva. World Health Organization.

Table 1 Characteristics of the sampled households: A comparison between North and South

Independent Characteristics		North (%)	South (%)
Mother's education: illiterate		42.7	22.6
Primary		12.0	13.9
Secondary		36.5	52.2
Higher		8.8	11.3
Mother's occupation: house wife		68.6	69.5
Service/professional		4.9	7.9
Agricultural work		21.3	15.1
Labour		5.2	7.5
Mother's age: 15-19		3.0	4.9
20-24		32.3	36.8
25-29		38.7	37.5
30-39		24.0	19.8
40 and above		2.1	1.0
Residence pattern: Rural		68.0	52.0
Urban		32.0	48.0
Wealth index: Poorest		9.4	7.7
Poorer		12.9	13.4
Middle		21.4	22.8
Richer		25.5	30.5
Richest		30.8	25.6
Religion: Hindu		77.0	77.3
Muslim		12.3	17.5
Christian		0.3	4.9
Others		10.4	0.3
Social grouping: SC		25.7	19.1
ST		6.4	4.4
OBC		23.2	53.0
Other		44.7	23.5
Drinking source: Unsafe		20.5	18.5
Safe		79.5	81.5
Toilet facilities: Unsafe		58.1	47.0
Safe		41.9	53.0
Mother's health			
Mother's BMI: Underweight		31.9	28.4
Other		68.1	71.6
Mother's anaemia: Severe Anaemic		2.0	1.5
Moderate		17.4	14.8
Mild		36.4	38.1
Non-anaemic		44.3	45.6
Child's health			
Stunted (Height for age)		41.1	35.4
Underweight (Weight for age)		34.4	30.5
Wasted (weight for height)		17.5	16.6
Women's autonomy index			
Low		38.8	32.6
Medium		42.4	43.8
High		18.8	23.6

Table: 2 Percentage distribution of Women's autonomy with respect to independent factors

Independent Characteristics	North zone			South zone		
	Women's autonomy					
	Low	Medium	High	Low	Medium	High
Mother's education						
Illiterate	44.9	38.7	16.4	39.5	40.0	20.6
Primary	41.8	43.2	14.9	34.5	41.0	24.5
Secondary	34.8	44.6	20.7	32.9	43.5	23.6
Higher	22.2	49.8	28.0	15.3	56.2	28.6
Mother's occupation						
House wife/domestic work	37.9	42.9	19.1	33.9	43.9	22.2
Service/professional	14.7	52.9	32.4	13.3	48.6	38.1
Agricultural work	48.9	37.0	14.1	39.9	40.7	19.4
Labour	32.1	46.6	21.3	26.6	43.5	29.9
Mother's age						
15-19	62.6	30.0	7.4	52.6	32.1	15.3
20-24	46.8	39.4	13.7	38.1	41.9	20.0
25-29	35.2	43.4	21.4	28.9	47.1	24.0
30-39	31.6	44.8	23.5	24.7	43.6	31.7
40 and above	30.9	56.1	12.9	28.3	49.1	22.6
Residence pattern						
Rural	44.9	38.9	16.1	36.5	43.9	19.6
Urban	25.9	49.6	24.5	28.4	43.6	27.9
Wealth index						
Poor	48.3	35.9	15.8	36.4	40.0	23.6
Middle	41.9	41.6	16.5	34.6	43.5	21.9
Rich	33.9	45.2	20.9	30.4	45.3	24.3
Religion						
Hindu	39.0	42.0	19.0	31.3	45.0	23.7
Muslim	39.9	41.4	18.7	43.0	35.9	21.2
Christian	10.5	52.6	36.8	16.4	52.4	31.2
Others	37.2	45.5	17.3	30.8	38.5	30.8
Social group						
SC	37.6	43.1	19.3	28.8	43.0	28.2
ST	51.1	31.7	17.2	37.0	41.0	22.0
OBC	44.5	40.7	14.7	32.0	44.2	23.8
Other	34.8	44.3	20.9	36.2	44.0	19.8

Table 3a Percentage distribution of child health status with respect to mother's health status

Independent Characteristics	Child health (%)					
	North region			South region		
	HAZ	WAZ	WHZ	HAZ	WAZ	WHZ
Mother's BMI						
Underweight	47.3	44.2	22.5	43.2	41.0	21.2
Other	38.3	29.9	15.1	32.2	26.4	14.8
Chi-square (p-value)	49.783 (.000)	132.000 (.000)	56.319 (.000)	55.022 (.000)	105.400 (.000)	30.852 (.000)
Anaemia status						
Anaemic	43.2	36.1	18.4	37.1	31.9	16.7
Non-anaemic	38.6	32.4	16.2	33.3	28.9	16.6
Chi-square (p-value)	14.705 (.000)	10.180 (.001)	5.472 (.019)	7.725 (.005)	5.602 (.018)	.014 (.907)

Table 3b Percentage distribution of child health status with respect to autonomy

	North region			South region		
Independent Characteristics	Child health (%)					
	HAZ	WAZ	WHZ	HAZ	WAZ	WHZ
Women's autonomy Index						
Low	42.8	34.4	17.9	37.9	31.6	17.1
Medium	41.2	34.6	17.0	34.4	29.5	16.0
High	37.7	33.9	17.4	33.7	31.1	17.2
Chi-square (p-value)	9.140 (.010)	.193 (.908)	.754 (.686)	7.028 (.030)	2.256 (.324)	1.035 (.596)

Table 3c Percentage distribution of women health status with respect to autonomy

	North region		South region	
Independent Characteristics	Mother's health (%)			
	BMI (underweight)	Anaemic	BMI (underweight)	Anaemic
Women's autonomy index				
Low	35.3	55.2	32.3	56.5
Medium	30.1	55.6	27.0	51.5
High	29.0	56.9	25.6	57.1
Chi-square (p-value)	23.0 (.000)	.959 (.620)	18.929 (.000)	14.162 (.001)

Table 4a: Percentage distribution of women health (BMI, Anaemia) with respect to independent characteristics

Independent Characteristics	North region		South region	
	Mother's health (%)			
	BMI (underweight)	Anaemic	BMI (underweight)	Anaemic
Mother's education				
Illiterate	38.1	60.5	42.1	61.8
Primary	34.2	59.3	35.4	57.4
Secondary	29.0	52.4	24.5	53.8
Higher	11.3	40.8	10.1	38.8
Mother's occupation				
House wife/domestic work	29.6	55.5	24.7	53.5
Service/professional	20.1	46.2	19.2	48.9
Agricultural work	39.8	58.2	50.4	60.1
Labour	41.2	57.4	28.4	57.6
Mother's age				
15-19	38.4	71.4	40.2	61.4
20-24	35.8	56.9	34.7	58.5
25-29	30.7	54.1	25.7	52.9
30-39	27.7	55.1	19.4	48.0
40 and above	33.8	51.1	20.8	56.6
Residence pattern				
Rural	36.2	57.6	36.5	55.2
Urban	22.8	51.5	19.7	53.7
Wealth index				
Poor	43.3	63.3	47.7	62.1
Middle	38.2	55.8	35.1	60.2
Rich	25.0	52.6	18.4	49.2
Religion				
Hindu	32.9	55.7	31.5	54.9
Muslim	35.3	58.8	17.8	55.6
Christian	21.1	73.7	17.6	42.4
Others	21.0	51.1	23.1	61.5
Social group				
SC	37.4	59.1	31.8	58.8
ST	41.3	67.2	44.1	61.2
OBC	34.1	56.5	30.5	53.9
General	26.3	51.7	18.0	51.0
Drinking source				
Unsafe	36.6	57.9	27.7	51.1
Safe	30.7	55.1	28.6	55.2
Toilet facilities				
Unsafe	37.9	59.1	39.0	60.2
Safe	23.6	50.9	19.0	49.3

Table 4b Percentage distribution of child health (HAZ, WAZ, WHZ) with respect to independent variables

Independent Characteristics	North region			South region		
	Child health (%)					
	HAZ	WAZ	WHZ	HAZ	WAZ	WHZ
Mother's education						
Illiterate	51.1	44.4	20.5	49.7	43.2	19.2
Primary	44.8	37.2	18.7	40.9	38.5	18.1
Secondary	34.3	26.6	14.4	32.1	26.5	16.0
Higher	16.7	14.8	13.7	15.1	13.9	12.8
Mother's occupation						
House wife/domestic work	39.0	32.4	17.2	32.3	27.1	16.3
Service/professional	30.3	23.4	15.2	33.9	28.3	13.8
Agricultural work	30.0	42.5	18.5	48.6	44.8	18.2
Labour	44.0	38.1	18.8	38.3	35.9	19.8
Mother's age						
15-19	48.8	37.4	20.7	42.6	37.8	18.5
20-24	40.7	32.3	17.6	38.3	30.2	16.7
25-29	39.0	32.6	15.8	35.2	30.3	15.6
30-39	43.7	38.9	18.9	28.8	29.8	18.3
40 and above	48.2	46.8	23.7	30.2	30.2	13.2
Residence pattern						
Rural	43.7	37.7	18.5	38.6	34.9	18.5
Urban	35.8	27.5	15.3	31.9	25.8	14.7
Wealth index						
Poor	54.8	50.3	23.5	50.8	46.4	21.5
Middle	48.4	40.1	18.6	40.9	35.7	18.6
Rich	32.9	26.0	14.6	27.3	22.5	14.0
Religion						
Hindu	42.0	35.5	17.7	36.6	32.4	17.7
Muslim	44.9	38.3	21.1	32.0	24.9	13.7
Christian	36.8	26.3	10.5	27.2	22.4	11.6
Others	30.3	22.4	11.2	38.5	7.7	7.7
Social group						
SC	49.2	41.3	19.0	42.9	39.0	18.5
ST	44.7	41.5	23.4	50.7	40.5	17.2
OBC	44.6	38.5	17.6	34.2	29.9	17.4
General	34.2	27.3	15.7	29.0	23.2	13.3
Drinking source						
Unsafe	42.3	35.2	18.7	35.7	31.8	18.4
Safe	40.8	34.2	17.2	35.3	30.3	16.2
Toilet facilities						
Unsafe	46.8	40.4	19.9	43.3	37.9	18.6
Safe	33.3	26.2	14.1	28.3	24.0	14.9

Table 5a Categorical logistic regression showing the association of risk factors of child health with women's autonomy

Autonomy	HAZ				WAZ				WHZ			
	odds	Significance	Lower limit	Upper limit	odds	significance	Lower limit	Upper limit	odds	significance	Lower limit	Upper limit
North zone												
Low	1.235	**.003**	1.077	1.417	1.023	.751	.888	1.178	1.034	.707	.868	1.233
Medium	1.156	**.036**	1.009	1.324	1.032	.661	.898	1.186	.972	.753	.817	1.158
High	1.000				1.000				1.000			
South zone												
Low	1.199	**.022**	1.027	1.399	1.025	.765	.874	1.202	.991	.925	.814	1.205
Medium	1.030	.699	.888	1.193	.927	.326	.796	1.079	.921	.389	.764	1.111
High	1.000				1.000				1.000			

Table 5b Categorical logistic regression showing the association of risk factors of women health with women's autonomy

Autonomy	Underweight				Anaemic			
	Odds	significance	Lower limit	Upper limit	odds	significance	Lower limit	Upper limit
North zone								
Low	1.336	**.000**	1.155	1.545	1.069	.334	.934	1.223
Medium	1.055	.471	.912	1.219	1.054	.442	.922	1.204
High	1.000				1.000			
South zone								
Low	1.382	**.000**	1.172	1.630	1.025	.743	.883	1.191
Medium	1.075	.375	.917	1.260	1.254	**.002**	1.089	1.444
High	1.000				1.000			