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MOTHER'S HEALTH, AUTONOMY AND CHILD IMMUNISATION- DIMENSIONS, FACTORS AND IMPACT ANALYSIS: A STUDY BASED ON EMPIRICAL EVIDENCES

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ABSTRACT: The importance of maternal and child health can be recognised from the inclusion of two goals Millennium Development Goals and later in Sustainable Development Goals also. Both the MDGs and SDGs focused on reducing mortality and improving health. One of most influential way to reduce child mortality is through child immunisation, as it reduces the risk of child death from vaccine preventable diseases. There are ample evidence in literature that dealt with all these aspects of child health and maternal mortality. Even after five years of Sustainable Development Goals the target achievement is not very satisfactory. On this background it is important to look back at the studies that offer an in depth analysis of the aspects related to achieve the target of mortality reduction and health improvement. Therefore, this study gives a thorough description of the earlier studies under three segment namely, mother's health, mother's autonomy and child immunisation. The study found that all these concepts are closely related with each other. There are different dimensions of mother's health and autonomy. the study further finds that mother's health and autonomy, especially, influences the level of child immunisation along with some other socioeconomic factors like mother's education, age, employment status, parity, sex of the child etc.

KEYWORDS: Mother's Health, Autonomy, Child Immunisation, Millennium Development Gaols, Sustainable development Goals, Empirical evidence.

JEL Classification: I1, I15

I. INTRODUCTION

When most of the country is concerned about its health and educational sector it is very important to assess the factors behind its operation. Economic growth is very closely related to human capital. And the fundamentals of human capital formation is enhancing health and education sector. These two indicators are both input and output of development. Thus the United Nations brought the Millennium Development Declarations signed by 191 nations in the year 2000 with eight goals to eradicate poverty, develop health and education, gender equality etc. The fourth and fifth goals of the Millennium Development Goals (MDGs) were to reduce child mortality and improve maternal health by 2015. After the target year's arrival it was analysed that the targeted rate was not fully achieved within the stipulated time frame. This leads to the introduction of Sustainable Development Goals (SDGs) in September, 2015 to achieve a more ambitious goals that was left under achieved by the MDGs within a time frame of 2030.

When we talk about mothers and child health many empirical evidences exist about the different dimensions, factors or its impact on economic development. Even before the introduction or MDGs or SDGs, many researchers tried to capture the contents of mother's and child health. These two concepts are very closely related. As a healthy mother is considered to be the backbone of children's healthy life. Right from the germination to even after birth mother is the prime source of care provider for a child. Thus the health aspect of a mother directly affects her children's health also. Along with mother's health the autonomy level of mother is another aspect that has an important role to play on child health especially immunisation. There are ample empirical evidence that reflects the importance of mother's autonomy for child immunisation. This paper tries to highlight those studies that dealt with mother's health-autonomy and child immunisation and tries to establish the relation among each other.

The paper is organised in five sections: the next section gives the empirical evidences related to mother's health followed by an overview of the studies related to mother's autonomy. And finally it presents a

descriptions of the factors that affect child immunisation that were found in literature. The paper ends with a concluding remark.

II. FACTORS AFFECTING MOTHER'S HEALTH

Health of children is hugely affected by health of mothers. Immunization of mothers before or during pregnancy may reduce the risk of neonatal mortality to a great extent. Several studies also support this statement. One such study was conducted by Rahman et al. (1982), in rural Bangladesh where they have studied the effect of maternal immunization of tetanus during pregnancy on neonatal deaths. In the study the researchers compared two groups of pregnant mothers, one group was provided two doses of tetanus injection and the other group did not receive any tetanus injection during pregnancy. The study showed that those who received two doses of tetanus injection 48-64 months before delivery had neonatal mortality 14.5 per 1000 live births lower than the non-immunized group. During pregnancy tetanus injection reduced the mortality rate by 42.8 per 1000 live births. Further the study found that if mothers received two doses of tetanus injection during pregnancy then the 4-14 days mortality rate was reduced by 70 percent.

A study conducted by Martin et al., (1983), found relationship between level of economic development and mortality of the nation. They also have examined mortality differentials by socio-demographic and environmental factors, both at aggregate and individual levels within a nation.

Another study conducted in Somalia by LaFond (1993), identified the factors influencing acceptance of immunization in two Somali communities. The author adopted a retrospective, qualitative approach to assess individual and community experience both with immunization and with the immunization programme. Data was collected from focus group discussions, informal interviews and observation. The researcher found the need of redesigning both the overall approach of the immunization programme and the content and style of health messages by programme managers and health workers with information.

Desai and Alva (1998), investigated the effect of maternal education on infant mortality, children's height for age and immunization status. Data was collected from first round of Demographic and health Surveys for 22 developing countries. The study concluded that, maternal education strongly influence children's immunization status.

Measham et al. (1999), studied to assess the role of income changes and other changes over time in determining infant mortality rate and total fertility rate. They also studied the `relative performance of India to other countries and also of the Indian states within the country. The input variable of the study was per capita income and over time changes like technical change, female literacy, age of female marriage and access to medical facilities etc. The output variable was infant mortality rate and total fertility rates of each states and country as a whole. GLS method of estimation was used to analyze the data. The finding of the study was that income and IMR/TFR are inversely related. The study also found that the relative performance of the states' fluctuates due to non-income state specific related factors rather than income variations. The study pointed to the importance of immunization and family planning programmes in reducing infant mortality rate and not only of the income factors.

Das and Dasgupta (2000), critically evaluated a broad macro-perspective of immunization programme on demographic trends and child health. Data was collected on 15 major states starting from the beginning of the 1980s to mid-1990s.But mainly the data was collected from the censuses of 1981 and 1991, sample registration system (SRS) annual surveys and reports and annual reports and yearbooks of MHFW. The analysis found a slackening of the initial thrust (1990-91) of the EPI, which was concerned from the point of vaccine preventable diseases (VPDs). The task of providing full coverage was suppressed in the underperforming states at that time as the size of net infants was increasing in all states. The study found the notion of 'herd immunity' on the right track despite of its controversy but although at the aggregate level VPD occurrence was lowered but the local epidemic was not abolished. It was clear from their study that the immunization programme was lacking not because of shortage of financial or physical resources rather the cause was incentive and management. The study reveals that the success of immunization programme also requires better political performance.

Harrington et al. (2000), conducted a study to assess the impact of mothers' satisfaction with the services during immunization process on completion of immunization. The study was conducted by interviewing the mothers of 1-2 years of aged children. They found in their study that mothers reacted emotionally during the process and they reported that the services offered during the immunization processes by health centres and health personnel are rough and inhuman. This kind of behavior deterred the mothers from completion of the process of immunization and resulted in defaulting behavior.

Agnihotri (2001), analyzed the district and state level infant and child mortality data in space and in time for West Bengal. The researcher found that state specific analysis was necessary to deal with the problem of infant and child mortality.

Ozcan (2002), studied to assess the effect of declining mortality on fertility, education and economic growth. The researcher took land which is of fixed supply and human capital determined by fertility and schooling choices of parents as the input variable of the study. The dependent variable was total output. Partial and general equilibrium model was calibrated by using historical and contemporary data on income and survival probabilities to estimate the data. The result of the study was that decline in mortality promotes economic growth through increased education and reduced fertility. The reduction in fertility is due to the fact that when survival probability increases population growth decreases.

Maternal mortality and morbidity control requires the attainment of antenatal care and presence of trained health personal during delivery. Mekonnen and Mekonnen (2003), studied to identify the factors that influence the use of maternal health care services in Ethiopia. The study was based on data collected from the Ethiopia Demographic and Health Survey, 2000. The dependent variable was use of antenatal care and presence of health personnel during delivery. The independent variable of the study were maternal age at birth, parity, number of children aged less than five years, educational status of women, marital status, work status, religion, residence and year of birth of the child. Bivariate and multivariate analyses was used in this study. Logistic regression was used for multivariate analysis. The study showed that residence, parity, education of women, religion, year of birth etc. were the independent factor determining the use of antenatal care in Ethiopia. While in case of delivery care the independent factors were education, religion, residence etc. (positively related). Higher parity and number of children less than five years are inversely related with delivery care in contrast to antenatal care. The use of ante natal care is more than delivery care. The reason may be due to painful journey to delivery centre during labour and delivery and also the costly delivery services. Place of residence and education were common predictor of both antenatal and delivery care. Marital status and religion was only important for use of antenatal care, parity was important for antenatal care in urban areas whereas it's important for whole country in case of delivery care.

Fishman et al. (2004), conducted a study on five years aged underweight children. The study was based on longitudinal data. The researcher found that underweight resulted in an increased risk of mortality, particularly from infectious diseases like diarrhea and acute respiratory infection (ARI).

Giapponi et al. (2014), found a positive effect of maternal education on child immunization status in United States. Author used two-stage least squares model to conduct the study.

Use of maternal health services also depend on various health system processes. How the health system is operating largely determine the success of any maternal service facilities in many countries. In this context Parkhurst et al. (2005), conducted a comparative study on four countries namely Bangladesh, Russia, South Africa and Uganda (two lower income and two middle income countries). They have tried to address how a health system facility influence the use of maternal health care services. In their study they have found that to reduce maternal mortality the most important factor was skilled delivery attendant universally. But there existed a wide country wise variation in the service provided by these health personnel. The efficiency of this factor depended on quality of health persons and availability of emergency facilities, among other factors. Another factors that influence maternal health service utilization is the public private mix of health facility providers. Existence of private health services can sometimes attract the efficient heath personnel from public sector, again somewhere may be the only provider of health services as NGO or Mission, as seen in rural Uganda and Bangladesh. Lastly health sector reforms played another role in the utilization of maternal health facilities. Imposition of user fee may reduce the use of health facilities. But it was also found that removal of fees not necessarily increases the use of facilities, probably because the use of health facilities also depends on other factors such as quality of the free services.

Berg et al. (2006), conducted a research to assess the effect of socio-economic conditions of early life on individual mortality rate. The input variable of the study was macroeconomic condition early in life (notably GNP), inflation rate and the share of agricultural share in annual GNP. The methodology used by them was a non-parametric comparison between the lifetimes of individual born in boom and recession that followed boom. For individual mortality a duration model was used. The study found that the children born in a recession lives a few years less than the children born in a boom. Authors also found in their study that there is a negative causal effect of economic condition early in life on mortality rate later in life. The study suggested that during recession the special focus should be on children aged zero by providing food, housing and health care provision as the effect bad economic condition may result in higher mortality in later life.

Acemoglu and Johnson (2007), conducted a research to find out the effect of life expectancy at birth on economic growth. They took improvement in life expectancy as their input variable; the improvement was due to International Epidemiological Transition in the year 1940. And the outcome variable considered by them was population, total births, GDP, GDP per capita, GDP per working age population and years of schooling. They used OLS estimation to analyze the data collected from National Health statistics of League of Nations (until 1945) and World Health Organization and United Nations (after 1945). The result obtained from the study was that there was no statistically significant effect of increase in life expectancy on total GDP. Moreover, relative growth rate of GDP per capita show some decline with increase in life expectancy as the improvement in the said resulted in increase in population. Similarly, there was no increase in human capital investment associated with improvement in life expectancy.

Similar study was conducted by Chimankar and Sahoo (2011), where they tried to identify the factors that influence maternal health care services utilization in Uttarakhand. Taking data from National family Health Survey (NFHS) III and using bivariate and multivariate analysis, the dependent variables considered were full antenatal care, safe delivery and postnatal care. They have taken nine explanatory variables as caste, religion, place of residence, mother's education level, household structure, wealth index, birth order, maternal age and exposure to mass media. All the explanatory variables have impact on the dependent variables. The significant explanatory variable as found in the study were educational level of women, exposure to mass media, birth order and wealth index. It was also found that the use of full antenatal care and institutional delivery have a positive impact on post natal care too.

III. MOTHER'S AUTONOMY: ENGAGING THE MOTHERS

A healthy mother does not only influence the health of her child but the behaviour as well. Physically or mentally ill mothers may react antithetically to the request of their children, which may affect the authoritative behaviour of children. Such a study was conducted by Kochanska and Kuczynski (1991), to assess the child-mother interaction where children initiated their requests and directive toward the mothers. Taking fifty Canadian mothers with five years of children the researchers found that those mothers who reported a history of depression denied the requests of their children more than the mothers who are mentally well. They reported that mothers with negative mood had a tendency to denial and depressed mothers also reacted to the immediate behaviour of their children rather than long term behaviour.

Maternal autonomy and child health are closely related. The women's autonomy sometimes depends on the intergeneration or kinship also. Gupta (1996), conducted a study on the pattern of kinship and intergenerational relation with gender inequality. She has conducted a study on two types of kinship and family system, on peasants in pre-industrial Northern Europe and contemporary Northern India. The study found that though gender discrimination was prevailing in both the societies but in Northern Europe the conjugal bond was stronger whereas in Northern India the power vested on the elderly persons of a family. The wives in India experienced dual inferiority, as being a woman as well as young member of the family. The empowerment in young age, when the reproductive phase was at peak, was less in Indian states and thus it affected the maternal and child health. The needs of the mothers were not met properly, further resulting in more child and maternal mortality. The empowerment level of the women was contradictory in both the societies of Northern Europe and Northern India where the empowerment was high in former society and gradually increased with age in latter society.

Similar study was conducted by Bloom et al. (2001), in urban Varanasi, Uttar Pradesh, India. In their study the researchers have tried to determine the dimensions of women's autonomy and their association with health care utilization. Using multivariate regression they found that the relation with maternal and marital relatives influence the level of autonomy. They found that the women living with mother-in-law experience lower autonomy than the women living in a nuclear family. Factors like age, education level, closeness to natal kinship etc. strengthened the women's autonomy level. They further found various socio-economic factors like age of mother, level of education, parity, economic status, problem experienced during pregnancy and delivery etc. were important to determine the use of maternal health care services. The autonomy of freedom of movement is very strongly and positively related to maternal health care utilization and child health.

When we talk about women's autonomy, it is also important to consider the husband's report of women's autonomy. As only women's reporting of autonomy and health care utilization may be overestimated. One such study was carried out by Allendorf (2007), where the author tried to report how both the spouses' reporting on autonomy and decision making is incorporated with health care utilization in Nepal. Though the previous researches including wives' responses only was not completely disregarded by the researcher but it was revealed that where both the spouses agree about the wives' autonomy, the health care utilization is stronger. Autonomous wife could better take decision about her own health.

Achayra et al. (2010), conducted a study to associate the socio-background characteristics of women with their decision making autonomy in Nepal. Based on Nepal DHS, 2006 the study considered women's age, employment, number of living children, residence, ecological zone, and development region as the socio-demographic variables. Using multivariate logistic regression the study established that the age of women, their employment status, economic status, number of children are positively related to decision-making autonomy. Urban and hill region women are more autonomous than rural or terrain counterparts. The study interestingly found that richer women are less likely to be making decision about their own health.

The concept of women empowerment and autonomy are often misunderstood and used interchangeably. Haque et al. (2011), conducted a study where they tried to distinguish the terminology of women empowerment and autonomy in the context of Bangladeshi women. By constructing indices using the data from Bangladesh Demographic and Health Survey-2004 they also measured the level of women empowerment and autonomy and the factors affecting the same in the Bangladeshi society. They measured their empowerment and autonomy level from three dimensions, namely, economic decision making, household decision making and physical movement. In the study the researchers found that the level of empowerment is greater than the level of autonomy. There were various factors such as women's age, residence, religion education level of both the partners, media exposure etc. that influenced empowerment and autonomy. But interestingly the study showed that with the increase in education though the level of empowerment increased but the level of autonomy decreased.

Enhancement in women's autonomy does not always imply the increased involvement of their male partners. Rather it may sometime negatively affect husband's attendance during maternal care and delivery. Ball (2013), studied in line with that in Nepal where the researcher assessed the level of women autonomy and its association with men's help in maternal health care. The study revealed that economic, movement and domestic decision making autonomy is negatively associated with husband's involvement in maternal health care where spousal communication enhances the same. Education level of both the partners, exposure to media and arrange marriage are important factors to involve the husbands in health care discussion and attendance during delivery. The author further suggested to implement such policies where simultaneous emphasis were given on enhancing women autonomy thorough education and economic support and involvement of husbands in maternal care.

Delivery with presence of a health personal extinguish the birth related complicacies. Observational experiences suggest that decision making autonomy of women is positively related with health attendant during delivery. Ameyaw et al. (2016) empirically examined the relation between women's decision making autonomy regarding health and the place of delivery in Ghana. They used descriptive and logistic regression method to carry out this study. It was divulged in the study that women with more autonomy regarding health decision making were utilizing the safe delivery option. The study also found that higher wealth and education status positively influenced the utilization of delivery with skilled persons. Younger and urban women were found to have more access to delivery care than older and rural counterparts. The women in Upper East region of Ghana accessed more skilled delivery care.

IV. CHILD IMMUNISATION: FACTORS DETERMINING ITS LEVEL

Zahid (1996), examined the mother's health-seeking behaviour and childhood mortality in Pakistan. The data for the study was collected from the 1990-91 Pakistan Demographic and Health Survey (PDHS), which covers all four provinces of the country. The researcher found that the children whose mothers are less than 20 years of age are having highest rate of neonatal, infant, and child mortality. Likewise first and higher order births children are having high infant and child mortality rate than among births of second or third order children. He further found that if the length of the birth interval increases mortality declines. The study also found positive effect of mothers' education on the neonatal, infant and child survival. Health services during the birth, antenatal care and immunization also influenced neonatal, infant and child mortality. It was suggested in the paper that health services and general education as well as mothers' education in particular should be improved in Pakistan.

Child survival is one of the positive outcomes of successful utilization of maternal and child health care services. Dutta and Srinivasa (1997), conducted a study to assess the impact of maternal and child health services on child survival in Pondicherry, a backward South Indian state. In their study it was came into view that an improved maternal and child health care resulted in increased child survival. They further have identified some factors suchlike birth weight, birth order, mother's age during child birth, delivery attended by health personnel etc. are responsible for infant and child mortality. They also found girl child are more vulnerable in the age group 1-5 years whereas more boys die in infancy.

Mother is the prime person who has the lions share in molding a child's physical as well as mental behaviour. Mother's behaviour can significantly affect the children's pain bearing capacity also. Chambers et al. (2002), conducted a study on such concept in Canada where the researchers clinically tested the maternal behaviour on children's pain experiences. Experimenting on a group of mother and children the study found that the girls whose mothers interlude in a pain promoting manner experienced more pain. From this study we can infer that the physical pressure of any child's immunization may be subsided by the mother's comforting attitude.

Harpham et al. (2005), conducted a study on four developing countries (Ethiopia, India, Vietnam, and Peru) to test the relation between maternal common mental disorders (CMD) and child nutritional status. The researcher took child stunting and underweight as the outcome variable. Household poverty, household composition, maternal characteristics such as age and education, child characteristics such as birth weight, age, and sex was taken as the potential confounding factors of the study. Possible mediating factors included the child's physical health and breast feeding status. He used logistic regression model to conduct the study. The researcher found a relation between high maternal CMD and poor child nutritional status in India and Vietnam. However, Peru and Ethiopia did not provide clear evidence for such similar association. The study suggested that child nutrition programmes in Asia should also consider promotion of maternal mental health.

Kahn et al. (2005), conducted a study to assess whether low socioeconomic status and child behavior problems as well as maternal health conditions and behavior are associated with each other. The study concluded that behavioral problems in the subsequent generation may be affected by social disparities in women's health conditions.

Mwabu G (2009), conducted a study to investigate the relation between mothers' immunization against tetanus during pregnancy and birth weight of children and found a strong association between the two.

Pandey (2009), examined whether under-five mortality was affected by maternal health. The data was collected from third wave of micro-level National Family Health Survey 2005-06 data for rural India. The study suggested that policies should be framed to attain Millennium Development Goal of reduced child mortality to avoid the generational transfer of poor health from a mother to her child.

Another study was conducted on Kerala, India by Kumar and Devi (2010), to examine the health status of women. The paper concluded that the Kerala needed to set strategies specifically to focus the vulnerable groups in terms of health and issues like problems of old age of women and widows, over medicalization, increasing cost of health care and occupational health of women.

Ray and Mishra (2012), found the failure of nutrition programmes to delink maternal health from child health in India as they found a negative relation between the BMI of mothers and child wasting. They found that in India the strength of this association increased over 1998-99 to 2005-06. But the researchers did not find such failure in China as India did not have the nutrition programmes that China had in place. The result was more shocking over the period when India was recording impressive growth rates.

Another study was conducted by Mittal (2013), in the village Bashahpur of Gurgaon. The researcher observed the nutritional status, dietary intake and morbidity patterns among 100 non-pregnant non-lactating rural women of reproductive age group (18-40 years) through cross- sectional survey of 100 women. The study found the need of improvement of diet quality and education for rural women for economic rise and better nourishment.

Kumar and Vollmer (2013), searched the impact of access to improved sanitation on diarrheal morbidity for children less than 5 years of age in India. They used District Level Household Survey 3 data set to quantify this. The researcher found that the access to improved sanitation reduces the risk of contracting diarrhea by 2.2 percentage points by using the propensity score matching technique.

Maitra and Ray (2013), analyzed child health indicators like – child malnourishment, prenatal, infant, and child mortality rates in West Bengal. It showed that these rates vary with the gender of the child, parental education, and the wealth status of households. Second and third rounds of the National Family Health Surveys (NFHS-2 and NFHS-3) were the data source of the study. The study found that though west Bengal was doing well in comparison to all India figures and east India but was lagging behind south India. In case of mortality its position was better than India as a whole and was competing fair with south India. It found a positive effect of mothers' education on child health and also suggested the requirement of effective policy to delink maternal health and child health.

Vollmer et al. (2014), aimed to assess whether macroeconomic growth resulted in reductions in early childhood under-nutrition in low-income and middle-income countries. The outcome variables of the study

were stunting, underweight and wasting. The independent variable was per capita GDP. Logistic regression model was used to estimate the association between changes in per-head GDP and changes in child under-nutrition outcomes. The researchers found that there was the need of direct health investments to improve the nutritional status of children in low-income and middle-income countries.

Maity and Kachari (2015), conducted a study to determine the factors that influence the socio-economic status of Bodo tribes of Udalguri district of Assam, India. They found out that factors like family size, literacy rate, the number of working age members (15-59 years) and operational land holding are the factors that influence the socio-economics status of the people of that area. The researchers also found that there exists intra tribal variation regarding the status.

Mawson et al. (2016), conducted a study to compare the health outcomes of vaccinated and unvaccinated children on a larger range. The researchers also tried to find out the existence of any association between vaccination and neuro developmental disorders and significance of the association after factor adjustment. Data were collected through a cross sectional survey of mothers of 6-12 years age group in four states. Using logistic regression model the study concluded that vaccinated children are less likely to be affected by some diseases like chickenpox and pertusis but at the same time it was also observed that diseases like pneumonia, otilis media, allergies and neuro developmental diseases are more reported in vaccinated children.

V. CONCLUSIONS

From the above presentation of empirical evidences we can conclude that mother's health and autonomy are closely related to child immunisation. There are many socio economic and demographic factors also that influence each of the aspects of health, autonomy and immunisation. Irrespective of global, national or regional studies it was seen that mothers education level, age, employment status etc. are the factors that influence mother's health, autonomy as well as child immunisation level also. It was also seen that health status and economic development are closely related. The dimensions of autonomy are identified as economic, decision-making and physical autonomy. All these dimensions of autonomy influence both mothers as well as child health. Thus we see in the empirical evidences that all these contents of health, autonomy and immunisation are interrelated. The time to time analysis of the different dimensions, indicators etc. are necessary as all these change generally over time. Hence this study provides a brief investigation to all these aspects over time.

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