INFLUENCE OF MATERNAL, HOUSEHOLD AND COMMUNITY FACTORS ON BIRTH WEIGHT: A COMPARISON BETWEEN URBAN AND RURAL POOR RESOURCE COMMUNITIES OF DELHI

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Chapter 5
Summary and Conclusions

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SUMMARY AND CONCLUSIONS

Birth weight of a newborn not only reflects child's growth in-utero and but also the possibility to survive and thrive after birth. It also reflects the health and nutrition status of the mother during pregnancy. India, struggling to improve its maternal and child health indicators, has many policies and programs in place to combat the issue of prevailing adverse pregnancy outcomes. Although salience of intervening in the crucial "first 1000 days of life" is well evidence driven, but in India's context, the still persisting high numbers of low birth weight and other adverse pregnancy outcomes raises concern over not only the current approach of addressing the issue, but also on the prevailing understanding regarding what leads to low birth weight and other adverse pregnancy outcomes. While factors related to nutrition, health and socio-economic status of mother and its impact on her health during pregnancy have been explored, other intervening factors having in-direct but crucial effects on the birth outcomes have been under researched. These factors often operate at multiple level and are multidimensional in nature. In the present study, data related to these multiple factors which could have a bearing of pregnancy and its outcome have been studied at three level; maternal factors, household factors and community factor. The primary objective of the study was to determine the maternal, household and community factors affecting birth weight of the newborn. The secondary objectives were to explore the maternal nutritional, and psycho-social health. The factors were explored in two contextually different environment, rural and urban poor resource communities of Delhi.

A prospective longitudinal study was conducted among pregnant women residing in the resource limited urban and rural communities of Delhi. A total of 400 pregnant women were contacted in the study but 318 of them completed the follow up till the third point (weighing the child at delivery). Pregnant women were enrolled in the second trimester of their pregnancy and followed up until their delivery to note the birth weight of the newborn. In the follow up, data was collected at three time points, at enrollment (second trimester), mid-point (third trimester) and at delivery.

To collect information on the socio-demographic, inter-personal dynamics and information regarding previous and current pregnancy, a pre-designed and pre-tested semi-structured questionnaire was used. To assess the depression, anxiety and stress during pregnancy and social support perceived by the mothers, DAS scale and MSPSS scale was used respectively. Dietary information was collected through one day 24-hour dietary recall and food frequency questionnaire. Beside conducting the questionnaires, Focus Group Interviews with the MIL and PW were also conducted to better understand the prevailing notion regarding factors affecting pregnancy and its outcomes.

Finally, analysis was conducted to determine the association between the factors operating at all the aforementioned levels and birth weight of the newborn.

The major findings of the present study are presented here:

5.1 Profile of the Respondents

5.1.1 Socio-demographic Profile

Majority (61.6%) were aged between 20-25 years, only 3.8 per cent were above 30 years and 8.5 per cent respondents were below 20 years. No significant difference was observed in the rural and urban area regarding maternal age. Most respondents in both the areas had received education up till secondary to senior secondary level. Further, majority belonged to the Hindu ethnicity (88.4%). Percentage of the Muslims were significantly higher in the rural area as compared to urban (p=0.03). Overall, nuclear family set up was prevalent, however, joint family system was found to be significantly higher in the rural area as compared to urban (p = 0.00). Reportedly, the monthly household income for most of the respondents was less than or equal to INR 10,000, with no significant difference between rural and urban areas (p= 0.5). Significantly higher number of respondents in the rural area reported to be living in the owned household as compared to urban area where mostly were living in the rented accommodation (p =<0.05). In the present study, pooled data showed that majority of the households had improved type of toilet facility i.e. flush (34.4%) and pit latrine (63. 5 %). Only 1.6 per cent of the household reportedly had no toilet facility and were practicing open defecation.

5.1.2 Obstetric History of the Respondents

Overall, 37.4 per cent respondents were married before or at the age of 18 years. The number of women getting married at or before 18 years was slightly higher in the rural area compared with urban, although the difference was not significant. Overall, 12.3 per cent respondents got pregnant at or before 18 years of age. Around 66.7 per cent of respondents were between 19-23 years at the time of their first pregnancy which coincides with the national level trends (IIPS, 2015-16).

Further 30.5 per cent respondents had a history of miscarriage; 6.6 percent reported to have at least one abortion previously and only 1.2 per cent and 1.9 per cent had pre-term births and still births respectively.

5.1.3 Information on Ante-Natal Care (ANC) during Current Pregnancy

Around half of the respondents had reportedly started ANC in the first trimester, and 47.8 per cent had started in second or third trimester of pregnancy. Area wise analysis showed that the percentage of women receiving four or more ANCs was much lower in the rural area as compared to urban (P=0.00). The most common ante-natal service received by the respondents in both the area was weight measurement (pooled estimates 91.8%). Number of respondents receiving nutrition or diet advices during pregnancy was very low (pooled estimates 11.9 %), which was, significantly lower in the rural area as compared to urban (3.3 % and 19.6 % respectively).

Further, only 25.9 per cent women consumed at least 100 IFA tablets during their pregnancy, with significant differences between the rural and urban area (P= 0.000).

The qualitative part of the study throws light on some of these factors. For instance, the FGIs revealed that while PW considered seeking doctors advise and consumption of medicine as an important factor for a healthy pregnancy, MIL on the other hand, considered it as unnecessary and a new generation fad. Many of the MIL also reported to have discouraged their daughters-in-law from having medicines in case of no ailment, highlighting that health care is still considered as a curative rather than preventive measure. This is an important finding as conflicting views on health facility uptake in a family can hamper the health service utilization among pregnant women as

the Indian society is still majorly traditional in nature. Studies conducted in other south Asian countries also shows that relationship of a women with her MIL can affect her uptake of the health service utilization (Qureshi, 2016).

5.1.4 General Health Profile during Pregnancy

Women were asked about their general health during pregnancy. Since women were enrolled in the second trimester of their pregnancy, most women started mentioning the health issues faced by them since conception i.e. first trimester. As per the pooled data, the most common health issues faced by women in the first trimester was "having mood swings".Further, significantly higher number of women in rural area experienced "mood swings" in the first trimester as compared to urban counterpart (P= 0.05). Loss of appetite and indigestion were others general health issues reported by the women that occurred during first trimester. In the second trimester, while mood swings as identified by irritability, was again quoted by many respondents, "body aches" was the second most common health issue faced by the respondents (72.3 % overall; 46 % in the urban and 40.5 % in the rural area). Similar trend was also observed for the third trimester. This could be attributed to the increased bodily change such as weight gain in the last two trimesters coupled with the household responsibilities a woman continues to perform during pregnancy. In the FGIs conducted with the PW, moods swings were reported by few of the women as a stressor during pregnancy. MIL on the other hand, considered general health issues as an excuse by the daughters-in-law to avoid doing household chores.

5.1.5 Nutritional Profile of the Respondents

Around 65 per cent respondents were reportedly non-vegetarian and 29.2 per cent were vegetarian. The findings reflect the national trend of high prevalence of non-vegetarianism as depicted in the Sample Registration System (SRS, 2014) and NFHS 4 (IIPS, 2015-16). However, the frequency of eating meat and other animal products was very low among pregnant women. Overall, more than half the women in the present study reportedly skipped meals frequently, and breakfast was the most commonly skipped meals by the respondents (49.1 % overall, 39.1 % in rural and 59.3 % in the

urban). The most common reason reported by the respondents for skipping meals was that they "do not feel hungry*"* (86.1%), followed by "lack of time" (15%) which was significantly higher in the rural area (p= 0.05).

In the present study, many foods were listed by the respondents to be restricted for consumption during pregnancy. The most common ones were Papaya (47.8%), animal foods (9.7%), fruits such as Sapota and Pineapple (3.5%). The reason for restricting such foods was the belief that it might harm the fetus and may cause miscarriage. In the FGIs conducted, PW reported that such dietary restrictions along with other restrictions increases their stress level. MIL on the other hand, supported the idea of restriction of certain foods during pregnancy. Animal foods were suggested to be restricted during pregnancy as it was believed these may change the "nature" of the child and make him short-tempered. Further, junk foods were also suggested to be avoided during pregnancy by the MIL. Timing of the meals was also one of the factors which was suggested by the MIL that can have an influence on the health of the mother and her fetus. While explaining about the timing of the meals, MIL reported that in today's time, in the name of rest as prescribed by doctors, PW keep sleeping till late in the morning. According to the MIL, getting up late in the morning meant skipping one meal of the day i.e. breakfast. As found in the quantitative findings also, breakfast was the most commonly skipped meals reported by the PW, however, the reason reported was majorly lack of time.

Further, the major source of information regarding diet related information were family members with mothers-in-law and husband being reported by nearly half of the respondents (48.5%). Only 11 per cent reported health personnel such as doctors to be the source of diet and nutrition related information during pregnancy. This reflects the crucial role of key family members in affecting the health and nutrition status of the mother and the newborn eventually. In the FGIs conducted with PW and MIL, although both emphasized the role of diet during pregnancy, MIL however, had many foods related notions that were not supported by any scientific evidence, for instance, meat and meat products, sapota, etc. are often discouraged to be eaten during pregnancy as they are considered as "hot food" which can harm the fetus and may causes miscarriage, there is however, no scientific evidence available for this.

Dietary analysis based on the one-day dietary recall and food frequency questionnaire was conducted in second and third trimester of the pregnancy. The data revealed inadequate food intake among pregnant women in both the areas. Cereals and pulses being the staple foods, were consumed on almost daily basis, however, the amount of consumption was inadequate in both the study areas. Green leafy vegetables and fruits was consumed very infrequently and in inadequate amounts by the respondents. The consumption of other vegetables was however, reportedly much better than other food in both the study areas. Further, consumption of fats and oils and sugar was found to be higher than recommended, while the consumption of milk and milk product was inadequate.

When the data was further analyzed to assess the nutrients intake of the respondents, the data revealed that diet of most pregnant women were deficient in both macro and micro nutrients in both the trimesters. A slight increase in some of the nutrients were observed in the third trimester, however, the increase was not sufficient to meet the RDA for pregnant women. All the nutrients were much less than the recommendations given by the ICMR for the Indian women during pregnancy. This highlights the highly unbalanced diet of the respondents. In the FGIs, although, the diet during pregnancy was strongly highlighted by PW and MIL as the most important factor for a healthy pregnancy outcome by PW and MIL, the inadequate nutrients intake could be an outcome of lack of knowledge among pregnant women regarding the adequacy of the amount of food and type of food to be eaten. Further, economic constrains and cultural belief pertaining to diet during pregnancy could also play a crucial role.

Data regarding daily household activity revealed that on an average, women in the present study reportedly spent 8.6 hours per day on doing household chores. The hours spent in the rural area was significantly higher than the urban ($p=0.00$). Further, majority of the respondents reportedly felt overworked during pregnancy with slightly higher number of women in the rural area reporting this (74.7%). In the FGIs conducted with PW, household work load emerged as a stressor during pregnancy. Many women reported that doing household chores during pregnancy stresses them physically and mentally. On the other hand, MIL believed that being physically active during pregnancy would keep pregnant women healthy and would also aid in normal delivery.

5.1.6 Findings on Psychosocial Factors

(a) Family Relationships and Dynamics

In the present study, pooled data analysis showed that majority of the women considered their relationship with husband as "fair/average" (57.5%), and 2.8 per cent have reportedly had "poor" relationship with their husbands. Significantly greater number of women in the rural area had rated their relationship with their husband as fair or average, as compared to their urban counter part (78.0 % and 39.3 % in the respectively). Further, majority of the respondents in both the areas have reportedly had faced restrictions imposed on them (94.7 %).

Domestic violence in terms of physical abuse was also reported by 18.7 per cent respondents. A significantly higher number of respondents in the urban area reported domestic violence as compared to rural. Also, data further revealed that majority of the respondents reported that they "sometimes" feel frightened of their husband (51.9% overall).

Another aspect of a healthy relationship within a family is the agency a woman holds within the household. In the present study, overall, although 42.5 per cent of the respondents felt that their opinions are always considered in the family, region wise data revealed that only 17.3 per cent in the urban area felt so. Further, as revealed in the pooled data, majority of the respondents in the present study reported their relationship with in-laws as "average" and significantly lower number of women in the rural area reported to have "good" relationship with their in-laws as compared to urban ($p=0.01$). In the FGIs conducted with PW and MIL, relationship with husband and mothers in law emerged as a strong influencer on women's health during pregnancy. Both, PW and MIL considered that women who share good relationship with her husband would be less stressed and will have a healthy baby eventually. A poor relationship with husband, MIL and others in the family was considered as a major stressor for women.

(b) Social Network of the Respondents

Over half of the women in the present study reported to have no friend circle or network (53.5 % overall). Among those who reported to have friends and social network, respondents from the rural area had slightly better network as compared to urban

(44.7 % and 43.4 % respectively). However, the frequency of meeting those friends was reportedly higher in the urban area (as reported by 58.3 %) as compared to rural (53.3%). In the FGIs also, PW revealed that daughters-in-law in a typical family, are often imposed with restriction regarding meeting with others outside the family. The severity of restrictions increases during pregnancy as many believed that it will help in keeping the *evil eye* away from the foetus. Such restrictions or beliefs do not allow women to develop their social network, which is important in keeping a healthy emotional state.

(c) Multidimensional Scale for Perceived Social Support (MSPSS)

In the present study, the social support perceived by the respondents was measured using a Multidimensional Scale of Perceived Social Support (MSPSS). Pooled data analysis showed that majority of respondents reportedly had medium level support at all three dimensions, i.e. family, friends and significant others. Significant differences were observed in the perceived social support among women from rural and urban areas, as women in rural areas reported to have less support at all three dimensions (family, friends and significant others) as compared to urban ($p = 0.05$). Higher percentage of women in the rural area had reported to share an "average" relationship with husband as compared to their urban counterpart. Further, although women in the rural areas reportedly had better social network in comparison to urban counterpart, but the frequency of meeting those friends was lower in the rural area.

5.1.7 Stress during Pregnancy

(a) Pregnancy Specific Stress

Available evidences show that pregnancy specific stresses are associated with adverse pregnancy outcomes (Lobel, 2008; Lewis, 2014). In the present study, pooled data analysis showed that major or the most common pregnancy related issues about which the respondents are most stressed were, *fear of labor pain* (65.1%), *worry related to new born care* (65.4%), *expenditure in medical care* (52.8%), *ongoing health problems* (47.5%) and *quality medical care (41.2%).* A significantly higher number of women in the rural area were stressed about all these stressors as compared to their urban counterparts ($p = 0.000$). In the FGIs conducted with PW, delivery related stresses such

as "*medical and hospital expenses"*, "*caesarean delivery"*, "*availability of help during and after delivery"*, "*taking care of the family"* and "*young child during and after delivery* "and "*working for the family (household chores)"* emerged.

(b) Depression, Stress and Anxiety

Pooled data analysis of DASS showed that in the second trimester, 43.4 per cent of the respondents had no to mild level of depression, however, respondents categorized in the moderate and severe depression was also high (38 % and 18 % respectively).

Further, more than one third of the respondents had no-to-mild levels of anxiety, however, in the third trimester, a greater number of the respondents were categorized in the moderate to severe levels of anxiety. Overall, 42 per cent of the respondents had no-mild level of stress, the percentage of respondents categorized with moderate level stress were equally high and severe stress reportedly increased in the third trimester.

Area wise analysis showed that in the second trimester, the proportion of women with depression, anxiety and stress was higher in the rural area as compared to urban (p=0.000, p= 0.000 and p= 0.003 respectively). Similar difference among rural and urban area was also observed in the third trimester also with PW, the common stressors reported were *gender of the child- preference for the male child*, *workload during pregnancy, financial stress*, *relationship with MIL and husband.* On the other hand, among MIL, the major stressors that emerged were *gender of the child- preference for the male child, young child responsibility, nuclear family and financial stress.* According to the PW and MIL, any kind of stress during pregnancy can have negative effect on the health of mother and consequently her fetus.

5.1.8 Type and Place of Delivery

Majority of the respondents in the present study had vaginal delivery (78.9%) and 92.3 per cent had it at the health facility. Although only 7.9 per cent of the respondents had delivered at home, the difference between rural and urban, was however, significant as a greater number of home deliveries took place in the rural area as compared to urban (p=0.05)**.**

5.1.9 Infant Profile

Majority of the infants in the present study were born with normal birth weight, with mean birth weight being 2.72±0.43 kg. Around 32.2 per cent of the infants were born low birth weight, the percentage of which was significantly higher in the urban area as compared to rural (p=0.003). The mean gestational age in the present study was found to be 38.58±2.60 weeks. More than half of the children born were male. To understand the concept of low birth weight at the community level, PW and MIL in the FGIs were probed regarding the determinant of health of the child at birth. While PW did report that birth weight of a child is an important determinant, MIL on the other hand did not consider birth weight as an important determinant. Instead of birth weight, many other indicators were pointed out to know the health of the newborn by MIL, such as *checking for any physical deformity*, *whether child cries at birth or not* etc.

5.2 Association of Maternal, Household and Community Factors with Birth Weight

Univariate analysis was conducted to find the association between factors operating at maternal, household and community level with the birth weight of the newborn. Pooled analysis showed that of all the variables, maternal education (p=.005), total IFA consumption during pregnancy (p= 0.002) and pregnancy weight gain had showed positive and significant association with the birth weight of the newborn (p= 0.002). Psycho-social health of the respondents which was assessed through depression, anxiety and stress scale (DASS) showed a negative significant relationship with birth weight of the newborn (p=0.001 and p= 0.03 respectively). This implies that higher depression, anxiety and stress scores were significantly associated with the low birth weights.

Factors which were found significant in the univariate analysis were further put through the multivariate regression model adjusted for socio-economic variables. In this analysis, many factors remained significantly associated with the birth weight of the newborns. In the regression analysis adjusted for regions, factors which were positively associated with the birth weight were maternal education, total consumption of IFA tablets by the subjects (p= 0.004), weight gain during pregnancy (p=0.01) and day time resting during pregnancy (p=0.04). Whereas, factors which were found to be negatively

associated with the birth weight were time spent on doing household chores (p=0.003), depression during second (p= 0.001) and third trimester (p=0.04), and domestic violence (p= 0.002).

5.3 Predictors of Low Birth Weight

To finally assess the predictors of low birth weight, logistics regression provided the information regarding odds of delivering a low birth weight baby.

5.3.1 Maternal Level Predictors

These include the factors operating at the maternal level that were found to be associated with low birth weight. Among all the social-economic factors, only maternal education came out be significantly associated with the birth weight of the newborn. The regression result implies that mothers with higher education were half times less likely to deliver low birth weight babies as compared to women with less education (Odds ratio of 0.55).

Among the maternal nutritional factors, although no significant association was found between the nutrients intake of the mothers and birthweight of the newborn in the present study, however, the mean intake of nutrients was slightly higher among the mothers who gave birth to the normal birth weight babies in comparison to the mothers of low birth weight babies. However, the difference was not statistically significant. Although the study could not establish a link between birth weight of the newborn and nutrients intake investigated, the role of nutrients cannot be overlooked. In the FGIs conducted with the PW and MIL, diet during pregnancy came out to be one of the strongest factors that was believed to have an impact on the health of the mother and the child. Both, PW and MIL suggested a diet containing fruits, vegetables, dry fruits, milk and saturated fat to be an important pre-requisite for a healthy pregnancy outcome.

Further, total IFA tablets consumption during pregnancy was significantly associated with the birth weight. This implies that low consumption of IFA during pregnancy was a risk factor for delivering low birth babies (with odds ratio of 0.990). Region wise analysis, however, showed that the low IFA consumption remained a risk factor for low

birth weight in the urban area only (with odds of 0.98). In the FGIs, regular consumption of medicines/supplements prescribed during pregnancy was considered important for healthy pregnancy by the PW, however, MIL did not consider it important to consume of any kind of 'medicines' during pregnancy.

Further, long hours of doing household activity was also found to be a significant predictor of low birth weight as women who reportedly spent more hours in a day on household chores were 1.2 times more likely to delivery low birth weight babies. Region wise analysis of the data, however, showed that long working hours at homes and less day time resting were a risk factor for low birth weight in the rural area only (with odds of 1.89 and .48 respectively). In the FGIs, although PW considered household work load as stressor during pregnancy, MIL on the other hand believed that household chores would help women in being physically active and would aid in normal delivery.

Similarly, depression in the second as well as third trimester had a strong predictor of low birth weight in the present study as showed in the pooled analysis. Women with depression in the second trimester were 1.1 times more likely to deliver a low birth weight baby *(p=0.000).* Similarly, third trimester depression was also found to be associated with 1.0 times more likelihood of having a baby with low birth weight *(p=0.001*). No such association was found in the urban area, however, in the rural area, depression in the third trimester and anxiety in the second trimester was found to be a risk factors for low birth weight babies (with odds of 1.16 and 1.22 respectively). Both PW and MIL believed that stress during pregnancy can have deleterious effects on the pregnancy and its outcomes.

5.3.2 Household Level Predictors

Interfamily Relationships Dynamics

Factors such as inter-personal relationship dynamics play a crucial role in the determining the mental health of the women. In the present study, while relationship with husband was significantly associated in the multivariate regression model, in the logistic regression, it does not remain significant. No other factors related to household remained significant in relation to low birth weight.

Domestic violence faced by a woman reflects not only her position in the household, but also the quality of her relationships with husband and other family members. In the present study, logistic regression model revealed that domestic violence is a significant predictor of low birth weight, especially in the urban area (p= 0.05).

In the FGIs also, family relationship and dynamics emerged as strong factors to have an influence on the health of the mother during pregnancy and consequently her child. Relationship with husband emerged as one of the most important relationship that can have profound effects on the health of the mothers and the child, as believed by both PW and MIL. Domestic violence, an indicator of quality of relationship of a woman with her husband, was highlighted as the major source of stress by the pregnant women.

5.3.3 Community Level Predictors

At the community level, while rural-urban differences were reflected in many of the maternal and household factors, factors such as availability of health facility in the community and distance of it from the respondent's place did not come out to be significant in any of the model of analysis. However, in the FGIs conducted with PW and MIL, many community or neighborhood factors were reported by the participants to have an influence on the pregnancy outcomes. While PW reported that the availability of health services in the community, and quality of the health services available can influence their health during pregnancy, MIL on the other hand, believed that the notions and beliefs of the people living in the neighborhoods can increases the stress level during pregnancy. One such way was the expectation regarding the gender of the child. Since male child preference was rampant in the community, MIL believed that the pressures to have a male child in the family increases if the others families in the neighborhood had a male child. Not having a male child in the family was thought to be a threat to their position and image in the community.

Overall, the findings from the present study highlighted that the factors which can affect the women during pregnancy and consequently her child, operates at many levels including individual, household and community.

While health and nutrition during pregnancy and its impact on the birth weight of the new born have been explored many times, the effect of nutrition sensitive indicators such as

family relationship and dynamics, depression, anxiety and stress during pregnancy, social support received by the mother during pregnancy, prevailing notions and/or perceptions regarding pregnancy and new born in the community and available health facility in the community have been less explored, especially in the context of how these can influence the birth weight of the new born. The quantitative findings provide significant link between these nutrition sensitive factors with birth weight of the new born, which is further backed by the qualitative findings that highlighted the prevailing perceptions regarding all these factors at the maternal, family and community level.

Hence to conclude, pertaining to the primary objective of the study, factors affecting the birth weight of the new-born were determined at the three level; maternal, household and community . While among maternal factors, low education level of the mothers, low intake of IFA consumption, depression and anxiety during pregnancy were found to be the risk factors for low birth weight, factors operating at the household levels, such as the inter-personal relationships dynamics as reflected through the relationship shared with husband also found to be a significant factor affecting birth weight of the new-born as found in the multivariate analysis. Domestic violence, an important indicator of the quality of the relationships a woman shares with her husband was found to be a risk factors for low birth weight. Through the qualitative part of the study, at the community level, although no significant association was observed, however, significant rural-urban differences were observed among various maternal and household factors, which covers the last objective of the study as well, which was to determine the rural-urban difference in the maternal nutritional, psycho-social, household and community environment. One of the secondary objectives was to assess the maternal psycho-social status which was assessed through DASS-42, MSPSS, and questions on pregnancy specific stress. The prevalence of depression, anxiety and stress was found to be high among the study population, especially among respondents from the rural area. The social support perceived from the family, friends and significant others was reported to be of medium level in both the areas.

5.4 Strength and Limitations of the Study

One of the strengths of the present study is that it highlighted the much-neglected dimension of health i.e. mental health during pregnancy and makes an attempt to assess its impact on the birth outcomes.

The study further explores the inter-personal relationship dynamics and its impact on the birth outcomes, which is majorly overlooked in the research conducted to assess the factors affecting the mother during pregnancy. Further, the study explores the factors affecting the pregnancy outcomes within the realm of rural and urban community that the mothers reside in. As observed during the pre-testing and field work of the present study, the rural area, although in transition owing to the ongoing urbanization, still preserves its traditionality which is reflected through the prevailing joint family systems, conserved social network especially for women, prominence of caste and religion based multi-layering in the community, and the still persisting traditional approach in the health care practices. The urban area, being impacted with the urbanization and the surge of migrants, developed into a more homogenous society in terms of caste and religion. The migrant's population living away from their family, rely more on their social network developed in the surroundings. These contextual differences that may arise due to the living surroundings can throw unique challenges to its occupants, especially among the vulnerable situation of pregnancy.

Another strong point of the study is that it uses mixed methods (Quantitative + Qualitative) approach in delineating factors operating at different level influencing the pregnancy and its outcomes. Focus group interviews were conducted as part of the qualitative arm of the study. The focus group interviews were conducted with MIL and PW to better understand the prevailing notions regarding the various levels of influencers during pregnancy at the community as well as household level. So far, perception of mothers-in -law in Indian context despite their important presence in households and the role played by them in the health seeking behaviour of a daughter-in-law especially during pregnancy, has been explored much less in an Indian context.

Overall, the study looked at the predictors of low birth weight beyond physical and socio-economic influences.

The limitation of the study is that nutritional and health status of the mothers was assessed through the recall methods and no micronutrients assessment was done. Also, due to the cultural issues, women could not be enrolled from the first trimester. Further, in the qualitative part of the study, although FGIs were conducted in the both the study

area i.e. rural and urban communities, however, due to paucity of time and the amount of the data presented and analysed, rural-urban differences in the qualitative findings could not be explored in very great details.

5.5 Future Actions

The findings of the present study showed that the factors affecting the birth weight of a new-born operates majorly at three levels; maternal, household and community. Although, most of the programs and policies currently in place, targets to improve the maternal nutritional status and emphasizes on the adequate intake of IFA during pregnancy. The still prevailing low intake of supplements during pregnancy highlights the poor uptake of ANC services at the community level. Further, findings suggest that the maternal depression, anxiety and stress during pregnancy can affect the birth weight of the new-born negatively, while social support received during pregnancy can have a protective effect. Family relationship and dynamics of a woman emerged strongly in the present study, both in the quantitative analysis as well as qualitative. A poor relationship with husband and other key family members, especially mothers-in-law, is an important predictor of the maternal psychological health.

Considering the findings from the present study, there is a need for a comprehensive intervention package addressing factors at all three levels; maternal, household and community. While the currently running programs targets the first layer of the influence i.e. mother, there is a need to re-evaluate the strategies in place to improve the maternal uptake of health services. As found in the present study, the major source of information for pregnant women was the family, especially the husband and mothers-in-law, any mis-information or mis-conception at these major sources of information can affect the health of the mother as well as her child negatively. Further, the psycho-social health of the mothers as reflected through the depression, anxiety and stress levels during pregnancy are yet to be included in the main stream programs and policies. The contextual influences on the birth weight, as seen in the rural-urban differences in the factors operating at maternal, household and community levels, highlights the need for a strategic context specific intervention to combat adverse birth outcomes. Diet and nutrition during pregnancy, which emerged strongly in the FGIs

with PW and MIL, found inadequate for pregnant women in the quantitative survey. This highlights that although women are generally aware about the importance of diet during pregnancy, there may lack a knowledge regarding the adequate amounts to be consumed during pregnancy.

Hence, based on these findings, few suggestions have been made:

- There is a need to develop a targeted context specific comprehensive intervention package for pregnant women.
- The current health care system for pregnant women need to include psycho-social health during pregnancy in the existing essential inputs. Although, the new WHO model of ANC takes into account some of these factors (screening for IPV), it is, however, yet to be implemented at the community level. Front line health workers, are therefore, need to be trained and quipped in tackling (identify) psycho-social issues among pregnant women during their ANC visitation.
- Since, there are multiple layers of influence such a relationship with husband and MIL, prevailing notions about childbirth in the neighbourhood etc. around a woman, it is important to intervene at all these layers to ensure better health outcomes during pregnancy.
- MIL who play an imperative role in a daughters-in-law's life in a traditional Indian family, need to be included into the programs as a kay agent of change at the household as well as community level.
- Although the awareness regarding the importance of diet during pregnancy was present among the women, the inadequate nutritional intake found in the study, highlighted the gap in the knowledge regarding adequate amount that needs to be consumed during pregnancy. It is therefore, required that women are made of their dietary requirement specific to their physical condition in a more technical way. Availability of dietitian and/or nutritionist at the local health centre along with other health personnel can help pregnant women better understand their requirement.