

## CHAPTER II

### ESSAY

#### **Nutrition Training: An intervention to increase the Knowledge and practice of Female Community Health Volunteer regarding the prevention of iron deficiency anemia during pregnancy in Nawalparasi District of Nepal**

##### **2.1 Introduction**

Women in developing countries are generally malnourished than men. The additional biological demands due to menstruation, pregnancy and lactation have made nutritional deficiencies the most widespread and disabling health problem among women. For example, low birth weight in newborns is partly a reflection of poor maternal nutrition. In 1990-1994, the proportions of newborns weighing less than 2500grms ranged from 13 percent to 50 percent in countries of the region

Iron deficiency anemia (IDA) is the most common nutritional cause of anemia which is a serious public health problem in developing countries like Nepal (WHO, 1997). The most vulnerable groups are young children and women particularly those of reproductive age and specially when pregnant. Anemia is a condition in which a blood is weaker than usual because it contains less of hemoglobin which results in a lowering of hemoglobin levels (Hb) below what is considered to be normal for specific demographic groups. It is estimated that 90 per cent of all the anemic individuals are to be found in the developing countries (DeMayer and Adiels Tegman, 1985). Among the developing countries highest prevalence is noted in South Asia. The WHO estimates that 74 percent of pregnant women in South-East Asia are anemic and available data indicates that IDA in Nepal is above to 70 percent in women during pregnancy and about 50 percent in pre school age children. His

Majesty's Government of Nepal (HMG) has recognized that anemia is a significant public health problem of Nepal and has formulated policies for its prevention and control. IDA is associated with several major casual factors including low dietary intake of iron, a shortage of available iron in the food taken or the presence of food factors which decrease absorption (phytates). Although iron from meat is the best absorbed iron source, due to religious and cultural restrictions meat is not a part of most Nepali diets. In Sarlahi district the prevalence of hookworm infection among rural pregnant women was found to be 78 percent of which 24 percent had moderate to heavy worm loads.

In 1986 the Joint Nutrition Support Program (JNSP) reported prevalence rates of anemia ranged from 71 percent in Sindhulipalchok District (in the hills) to 95 percent in Nawalparasi District (in the Terai) among mothers of children 6-36 months old. A study conducted in 1987 reported that the prevalence of anemia is about 68 percent among non-pregnant in the middle hills. The National Nutritional Intervention Project (NNIPS) conducted in Sarlahi District reported an anemia (hemoglobin <11g/dl) among women during mid-pregnancy to be 68 percent. The prevalence of mild anemia among this cohort of women was 31 percent, moderate anemia was 32 percent and severe anemia was <7g/dl was 4 percent.

**Table 2.1. The criteria for determining the presence of nutritional anemia as recommended by WHO (De Maeyer, 1989 ).**

Hb<11g/dl	Pregnant women and preschool children below 5 years.
Hb<12g/dl	School children, adult women including lactating women.
Hb<13g/dl	Adult men.

Anemia during pregnancy increased the risk of low birth weight infants. which increases the risk of infant mortality. Severe anemia during pregnancy has been linked to an increased risk of maternal mortality. The attributable risk of maternal mortality from severe anemia has been estimated to be 13 percent in Sarlahi District.

The main issue in this essay is low consumption of locally available and affordable iron rich and iron absorbent foods. So if we train the FCHV they could be able to give nutrition education to the pregnant women. regarding the prevention of IDA. Therefore I hope that Pregnant mothers will consume more iron rich and iron absorbent foods which are available and affordable from their village. Because the FCHV have been utilized in distribution of vitamin A, controlling of diarrhea disease, counseling of family planning and they have become success and popular in these activities so I would also like to mobilize them by giving additional training in nutrition education regarding the prevention of IDA to the FCHVs of the selected villages.

There are many reasons for low consumption of iron rich food (IRF) and iron absorbent food (IAF) as low socio-economic condition, low literacy rate, low status of women, food taboos, lack of knowledge about iron containing food. There are other alternative solutions to increase the consumption of IRA/IAF by motivating the women to attend antenatal clinic at health post, sub health post for check up and to have iron tablets but only 19 percent pregnant women are attending maternal child health as due to that the health post are far from the village.

In Nepal despite the prevalence of anemia levels of over 70 percent in pregnant women only 10 percent of mothers are taking iron supplies during pregnancy.(HKI, 1997).The major reasons for this low coverage of iron supplies are that supply is always not available at the nearest health institutions and that a large proportion of pregnant women do not have contact with health personnel. While iron supplementation trials in different countries have shown a considerable reduction in maternal anemia. Proportion to the dose and duration of supplements iron supplementation programs have found it difficult to significantly reduce the prevalence of anemia. The major constraints to improving the program effectiveness are low coverage and low compliance. Coverage is the percentage of the target groups who take the prescribed number of iron supplements Compliance is the percentage of iron supplements actually taken by women who have received iron supplements. Coverage is affected primarily by the supply of iron supplements and access to the delivery system. Compliance is influenced by side effects ,counseling and willingness of women to consume iron supplements during pregnancy. According to WHO report on women's compliance, a women's perceptions of her pregnancy and her health status are of great importance when she makes decisions regarding her health. These

perceptions reflects her cultural background as well as her status within her household and community.

**Compliance is effected by factors such as :**

The lack of information, education and communication (IEC) at the community level.

Pregnant mother is not aware of :

1. The side effects iron supplements can cause particularly for the gastro – intestinal system ( symptoms such as nausea, a mettalic taste in the mouth, loss of appetite, stomach ache, vomiting and constipation are common ,iron supplements can also make the stool black which is disturbing sign for a women who is not aware of the cause).
2. The mortality risks of severe anemia.
3. The increased risks of low birth weight babies in moderate and severe anemia.
4. The need to take extra iron during pregnancy.

**The major reasons for poor coverage in Nepal are:**

- The supply is not always available through the MOH delivery system of health post and sub health post.
- Women do not have easy access to iron supplements provided at health centers.
- The proportion of pregnant and lactating mothers in contact with health personnel is very low.( HKI, 1997)

## 2.2 Iron Requirement during Pregnancy

Iron requirements is increased during pregnancy because of growth of fetus and placenta, and expansion of mother's blood volume. Iron requirements over the whole pregnancy is about 1000mg( 300mg for the fetus, 50 mg for the placenta, 450 mg for the increased in the maternal red cells mass and 200mg for the continuing maternal iron loss.) Pregnant women do not menstruate but they need extra iron for the growth of the fetus and placenta and to build up their own blood volume. (WHO , 1991). Iron requirements during the first trimesters are small, 0.8 mg per day , but rise during the second and third trimesters to a high of 6.3 mg per day. After delivery and lactation iron requirements decrease to 1.3 mg per day (WHO, 1991). Therefore requirements for iron has to be met by the body's iron status. However iron status are low or absent in the great majority of women in developing countries due to a diet low in iron, due to lack of knowledge on nutritive values of iron rich and iron absorbent foods, chronic blood loss from parasites and frequent closely spaced pregnancies. Benefits of preventing iron deficiency anemia during pregnancy include improved work capacity, improved mental performance, improved resistance to infection and safer pregnancy and delivery.

## 2.3. Diet during pregnancy

The nutritional status of the mother at the time of conception is important for the outcome of pregnancy because a person's life starts from the moment of conception. The fetus receives nourishment through the placenta and so the food take by mothers during pregnancy influence the development of the fetus (HMGN, 1993). So the pregnant women have to eat extra food for the growth of the fetus and placenta and for the deposition of fat which is the part of the pregnancy weight gain.

The increased requirement for energy can be made available by reducing the expenditure of energy as well therefore besides eating extra amount of food, the pregnant mothers can save extra energy working less and resting more (Adhikari, and Krantz, 1997)

Adikari and Krantz (1997) stated that the women particularly married women Daughter-in-law occupies a low position in most of the high caste families, she has to do most of the work but her diet is given least important. It is common practice in such families for women who eat whatever is left in the kitchen after the men and children have eaten.

Women have higher requirement of iron than men. Many mothers in developing countries are malnourished before conception and during pregnancy. So iron deficiency anemia occurs in women of developing countries. Iron deficiency anemia is directly related to the consumption of food. The women in Nepal do not get adequate diet especially iron rich and iron absorbent foods either during reproductive age or during pregnancy so the poor diet is one of the associated factors of iron deficiency anemia (UNICEF,1996).

In Nepal because of religious ,cultural and traditional beliefs people may receive an inadequate nutrition intake even in households where there is plentiful food supply. A well nourished women with access to good health care who is aware of the need to take reasonable rest during pregnancy and who is generally eating well in response to her appetite may not need special and extra intake of food. Various studies have shown no need to do so when adequate nutrition during pregnancy not

only ensures the birth of a healthy baby but also prepares the mothers to withstand the stress and strain of labor. There is a definite need to emphasize the role of extra food for a pregnant and lactating mother where the intake is inadequate and there is excessive workload and the women are generally undernourished and anemic.

## **2.4. Consequences of Iron Deficiency anemia Relating to Pregnancy**

### **2.4.1. Maternal Mortality**

Women frequently enter pregnancy with inadequate iron stores. Thus the increased demands associated with pregnancy result in anemia. Adult women are considered anemic when hemoglobin levels fall below 11.0 g/dl during pregnancy. Anemia with hemoglobin concentrations below 11.0 g/dl is associated with decreased work capacity and mental performance and probably with impaired resistance to infection. (Thongnopakhun Wandee-1993) Anemic women are less tolerant to blood loss at delivery, when hemoglobin levels fall below 8.0 g/dl. When malaria and or hookworm complicated iron deficiency, anemia can be more severe, having hemoglobin levels below 6.0 or even 4.0 g/dl. At 6.0 g/dl, women experience breathlessness and increased cardiac output at rest.

At this stage severe anemia during pregnancy is associated with an increased risk of maternal and fetal morbidity and mortality. So Anemia is a major contributory cause of post partum mortality. There is a good deal of evidence that relates maternal mortality to severe anemia. In Maharashtra, India 90 percent of all maternal deaths occurred in women with Haemoglobin levels of less than 7 grams per 100 milliliters of blood. (Fleming, 1989). In Nigeria Hanison found that 4 percent of mothers with severe anemia (Hb levels less than 5 grams per 100 milliliters of blood ) died in child



birth. Some evidence suggests that 20 percent of all maternal deaths in West Africa and India (When blood transfusion was not available ) were directly related to anemia and that additional mortality resulting from hemorrhage was indirectly caused by maternal anemia (Fleming, 1989).

A recent review of 21 studies in Africa and Asia (Ross and Thomus, 1996) concluded that a reasonable estimate of the risk of maternal mortality related to anemia is 20 percent in Africa and 22.6 percent in Asia. These are deaths that would have been avoided if the mother were not anemic. The values are composites of direct anemia related mortality 7.6 and 10.8 percent in Africa and Asia respectively plus indirect anemia related mortality that is 25 percent of all hemorrhagic deaths plus 10 percent other maternal deaths. Direct anemia related mortality is heart failure, shock or infection that has taken advantage of the women's impaired resistance to disease.

**2.4.2. Fetal Growth Retardation ,Prenatal and Perinatal Mortality** Many mothers in developing countries are malnourished before conception and during pregnancy. This is one of the reasons for the larger number of low birth weight babies.(LBW-Babies weighing less than 2.5 kg at birth). In developing countries there are many causes of low birth weight. Some of these are poor nutritional status of the mother, maternal anemia and maternal infection of the pregnant women (Adhikari,R.K. and Krantz,M., 1997) low birth weight is a major factor in subsequent infant morbidity and mortality

Iron deficiency anemia is directly related to risk of preterm delivery, low birth weight and increased perinatal mortality. The more severe the anemia the greater risk deliver a low birth weight that the mother will deliver a low weight baby because of

poor uterine growth. Even mild anemia has been related to placental hypertrophy and raised risk of low birth weight. It is well known that low birth weight babies have a high risk of dying in infancy and early childhood. There is also increasing evidence of a risk of coronary heart disease in later life as suggested by studies in the UK (Baker 1993) and more recently in South India severe maternal anemia has been associated with increased child as well as maternal mortality.

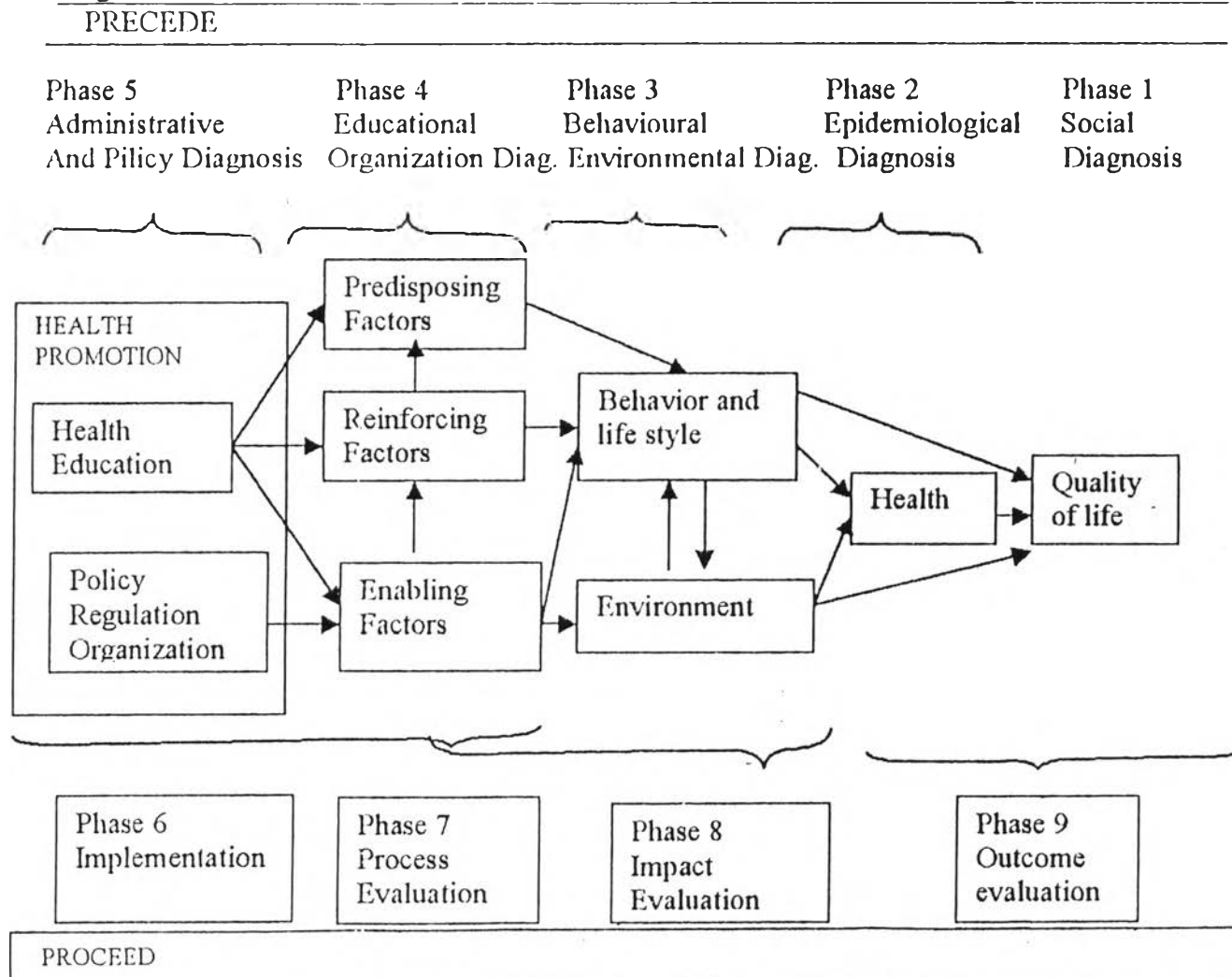
#### **2.4.3. Low resistance to Infection**

Iron deficiency anemia has been reported to decrease resistance to infection by impairing lymphocytes and granulocytes functioning. The prevalence of local and infection male plantation workers in Indonesia was found to be nearly twice as high in the anemic men as in the non-anemic ones. Baker and De Mayer discussed other evidence that showing that iron deficiency anemia decrease resistance to infection and impair immunological functioning.

#### **2.5 Analyzing Precede-Proceed Model:**

The Precede- Proceed model was developed by Lawrence Green to assist health educators in conducting a thorough evaluation of all factors that may be involved in planning a community wide health program. The original Precede model ( Green, Kreuter, Deeds & Partridge, 1980) was recently expanded and

Fig.2.1. Precede-Proceed Model



named the Precede-Proceed model (Green & Kreuter, 1991), because it now deals more fully with the implementation and evaluation of health programs. The model shows what steps must precede the initiation of a program, then provides guidance on how to proceed with implementing the program. There are five phases in the Precede portion and four phases in the Proceed portion of the model. (Fig. 2.1.)

Phase 1 is social diagnosis. The quality of life of the target population is assessed as well as the major problems that concern the people. Successful programs tend to deal directly or indirectly with the issues that the people are most concerned with and therefore are motivated to change.

Phase 2 is epidemiological diagnosis. Epidemiologic data may need to be collected to identify the major causes of morbidity and mortality in this population.

Phase 3 is behavioral and environmental diagnosis. The behaviors and environmental factors that are related to the major health problems must be identified. Environmental factors are often beyond the control of a given individual. Since the intervention programs will be designed to change these behaviors and environmental conditions, the assessments should be as specific as possible.

Phase 4 is educational diagnosis. Green has proposed three factors that health education programs must consider to produce behavior change. Predisposing factors increase or decrease the motivation for change. Cognitive variables such as attitudes, beliefs and values can affect motivation to change. Enabling factors are usually thought of as barriers to change created by societal forces or systems. Examples include limited facilities, lack of income or health insurance, advertisement or promotion of unhealthful behaviors and restrictive laws.

Reinforcing factors are usually social feedback that encourages or discourages behavior change. The educational diagnosis consists of identifying those predisposing, enabling and reinforcing factors that have the most direct effects on the target behaviors.

Phase 5 is administrative diagnosis. Step 1 through 4 lead to the design of the targeted intervention program. In step 5 the realities of resources, time constraints and abilities are assessed. The health education program that is needed must be reconciled to the availability and limitations of these administrative considerations.

Phase 6 through 9 concern the implementation and evaluation of the intervention. Implementation of the program (phase 6) is easy to write but more difficult to do in the real world. Changing health behaviors requires educating people, working with people, working with organizations that may not be interested in improving health and trying to stay within a budget.

Process evaluation (phase 7) determines whether the intervention changed the predisposing, reinforcing and enabling factors that were targeted. Impact evaluation (phase 8) determines whether the important behavioral and environmental factors were successfully altered. Finally outcome evaluation (phase 9) determines whether the population experienced improved health and quality of life as a result of the intervention. These evaluations are both difficult and costly to do and many programs are never adequately evaluated. However this model describes an ideal approach to evaluation. This model is particularly useful because it forces planners to deal with the logistic or realities of conducting a health behaviors change program, as well as the theories of behavior change.

The whole model is a nine phase process, which concludes that health behaviors are not simple, but multi dimensional and influenced by a variety of factor( Dignan and Carr,1992). This model provides a format for diagnosing different factors related to health problems, behavior and program implementation. This model (in fig. 2.2) have been used to analyze to identify the possible reasons for the incidence of iron deficiency anemia, which has been slightly modified in my study. It explains the varies factors that influenced the causes and consequences of IDA.

### **2.5.1. Predisposing Factors:**

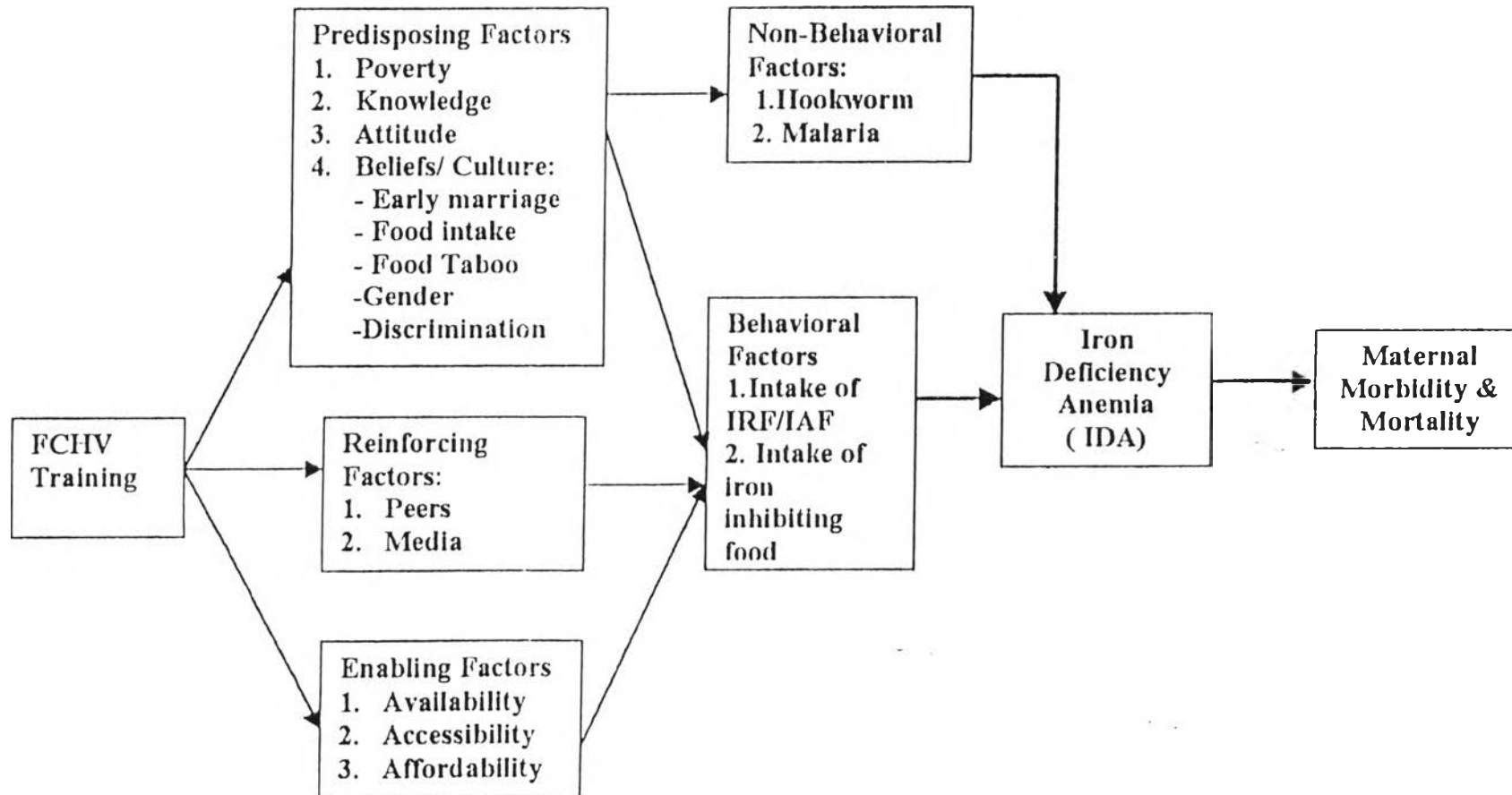
Predisposing factors are the antecedents that provide the rationale or motivation for the behaviors. In another word, predisposing factors motive an individual or group to take any action. Predisposing factors include the cognitive and effective dimensions of knowing ,feeling, valuing and having self confidence or a sense of efficacy. Knowledge, beliefs, food taboos, cultural modes as early marriage, gender discrimination, low status of women and are some of the examples of predisposing factors which are analyzed below based on the available documents.

#### **2.5.1.1 Knowledge-education**

Formal education is of great importance for the development of all young people. As regards formal education opportunities in Nepal, girls have less chances

**Fig 2.2. Casual Factors Affecting Iron Deficiency Anemia**

Modified from Precede-Proceed model ( Kaplan, Sallis, Patterson, 1993)



than boys as often it is found that the illiterate mothers oppose their education as they needed to help in domestic work, therefore female literacy is low and there is disparity with male rates.( SMHN, 1997) Education for women is not a priority in the South East Asia regions and is indicated by the wide male/female disparities. Women are seen as inferior human beings who cannot do better than men if they are educated. (Ahmed, 1993). There is belief that there is no need to invest in daughter's education and other factors which prevent the motivation of parents for sending their daughters to school include the distances between the school and home, lack of female teachers, discrimination between sons and daughters, many girls are married at a very young age, lack of people's awareness about the female education and illiteracy of the people, girls children must look after domestic works and child care activities, many families hold traditional beliefs that girls education is not necessary and is a waste of money as she will be married off and due to lack of regularity, promptness and presence of teacher in school.( Women's Health, 1998)

Between 1952 and 1993 in Nepal the male literacy rates increased from 9.5 to 57 percent, while female literacy rates only changed from 0.7 to 23 percent. So the cultural bias, the variable quality of school education and poor socio-economic conditions have been s major causes of the low enrolment of girls in schools. Many young people cannot attend school for economic reasons or because of too early marriage and others do not attend because of psychosocial difficulties.(WHO, 1993) As Nepal is one of the poorest countries in the world having per capita increase estimated at \$180 and female literacy rate is only 25 percent and a large majority of people continue to live in poverty, depending on agriculture, low income, having less food available. Women with low education tends to have Iron deficiency anemia. Due



to lack of education and due to low literate rate women do not know which foods are iron rich, which are iron absorbent and which are iron inhibiting food .So they also don't know that which locally available cheap foods contain iron so that is the reason why there is high iron deficiency anemia which is common in Nepal and which is one of the contributing factors of high maternal mortality and infant mortality.

#### **2.5.1.2. Poverty:**

Two out of three women around the world are poor. Millions of women are caught in a cycle of poverty that begins even before they are born. (A health guide for women, 1998) Babies born to women who did not get enough to eat during pregnancy are likely to be small at birth and to develop slowly. In poor families girls are less likely than their brothers to get enough to eat ,causing their growth to be further stunted. Girls are even given little or no education so as women they must work at unskilled jobs and receive less wages than men.(even if they do the same kind of work) Exhaustion ,poor nutrition and lack of good care during pregnancy place the women and her children at risk for poor health.

In Nepal majority of the rural population is estimated to be living below the poverty line. According to the World Bank “ By any reasonable international standard ,everyone in Nepal is poor ,except for a few professionals and businessman and perhaps some large farmers.(Situation Analysis, 1996) In Nepal poverty is caused by low literacy rate , due to high population pressure , inequitable land ownership simple techniques of production and skills levels incompatible with modern jobs. The problem of poverty is most acute in the hill and mountain regions of Far Western Nepal due to the transportation problem According to the World bank estimates of

1990, 71 percent of the population are poor. Michael Lipton's measurement defines the poor as those where food expenditure absorbs 70 percent or more of total expenditure. Lipton's estimate in 1990 showed that 66 percent of the population are living below the poverty line.

Poverty in Nepal is linked mainly to a shortage of productive agricultural land. The absolute poor in the hills own 0.3 hectares of land, less than the national average of 0.5 hectares per household. A composite profile of a poor rural family suggests a household with under 0.5 hectares, producing grain sufficient to feed the family for less than 6 months of the year. A typical rural family is sustained by off-farm labor, principally pottering and laboring. Off-farm employment provides up to half of family income but the value of the labor of such families is lower and they have to work longer and harder to achieve a subsistence wage. As well off-farm opportunities are not always available. In such a situation, family members are forced to migrate in search of work elsewhere in Nepal or in India.

Like poor men the vast majority of poor women are concentrated in low productivity subsistence agriculture in the rural areas. Women are paid less than their male counterparts. Women have to work long hours to fulfill the subsistence needs of their household members, because labor productivity is so low. Women's participation in the market economy increases their status. Economically Nepalese women are weakly subjected to low-paying unskilled jobs. In our real situation the members of Nepalese women are expected to make a living for themselves in many cases they have to provide livelihood for their children, who are orphan or ignored by their father also. According to 1971 data 98.2 percent of economically active women

were engaged in agriculture (Situation Analysis, 1992) So therefore nutrition education is very important because they can consume more foods especially iron rich and iron absorbent foods from the kitchen garden. Therefore Kitchen garden could be an excellent source of fresh vegetables including iron rich and iron absorbent foods for the family if it is managed properly. It is not necessary to have a big land for kitchen gardening .It requires self-determination and interest. If we have these two things we could establish a kitchen garden in a small area even in the roof of our house and produce quality fresh vegetables for our daily Kitchen garden is a traditional practice in our society. It saves our expenditure and also makes one feel healthy. (Sitaula, N, 1996)

#### **2.5.1.3. Early Marriage:**

Early marriage or teenage marriage for girls is socially accepted norm and a common pattern in the life of girls in South Asia.(SAARC, 1993) Early marriage is more common in rural areas than in urban. The traditions of early marriage or teenage Marriage and pregnancy is still widely practiced especially among more illiterate rural population due to low status of women. In Nepal early marriage is common than the legal age of marriage. Early marriage is one of the social custom in Nepal which leads to high infant mortality and maternal mortality because of the particular risk she runs in giving birth before she is physically fully developed .Legislation to control marriage age is rarely implemented in Nepal.(UNICE, 1992)

In many parts of the developing world especially in rural areas girls marry shortly after puberty and sometimes even before. Teenage marriage is widespread in the developing world with the highest incidence in Nepal ,where 34 percent of 15 years old girls are married, in Bangladesh 25 percent of 14 years old girls are married.

In south –east Asia, Africa, and Latin America, 24 percent , 44 percent and 16 percent of women under 20 are married.(WHO, 1993)

The early marriage and pregnancy contribute to iron deficiency anemia (IDA) by increasing the iron requirements of teenage girls at a time when their iron requirements are already high because of their recent onset of menstruation. When the girls grow because of poor nutrition she becomes malnourished teenage and becomes anemic. Early marriage by leading to early pregnancy interfere with the pubertal growth of the women and results in poor nutritional status( UNICEF-1992) Her bony physical growth is poor and hampered as they have small size pelvic bones and thus small birth canals so later at the time of pregnancy and delivery she has problems such as obstructed labour due to cephalo –pelvic disproportion (CPD) which is a major cause of maternal death.( World Bank, 1996).

Anemia in pregnancy cannot withstand even minimum amount of blood loss leading to high maternal morbidity and mortality. Their nutritional deficiencies may have effects on their children resulting in infants low weight birth disabilities or deaths.(UNICEF-1996) As they grow older, repeated pregnancies, anemia, continual malnutrition and excessive workload can result in early death and Nepal is one of the few countries in which women's average life span is shorter than men. So it is very important to prevent women by giving advice to consume more locally available iron rich ,iron absorbent and avoiding iron inhibiting food during pregnancy .The girl who marries at the age of 15 faces at least 25 years of continual pregnancy and child bearing with the consequent hazards of multiparty and increasing poverty as the size of multiparty and increasing poverty as the size of the family increases beyond the desired level.

In Nepal, the legal age for marriage is 18 years for female. 60 percent of marriage takes place between the ages of 15-19 years. A study (New Era, 1993) had found that 68 percent of the women in Nepal get married by the age of 18 years. The mean age of marriage was reported to be 15.8 years while years between 20 and 30 are the safest period for women's life for child bearing. According to 1986 estimate 40 percent of Nepali women had given birth to one child between the age of 15 and 19 years. Therefore for many girls in Nepal, this continuing custom of early marriage before complete physical development contributes to high rates of both infant and maternal mortality. (UNICEF, 1992) So FCHV training in our country is very important regarding the prevention of iron deficiency anemia (IDA) so they could give Nutrition education to the community and the prevalence of IDA could be prevented.

#### **2.5.1.4 Food Taboo and Beliefs:**

In many countries mothers believe that if they eat too much the baby will grow too big. They will think the big baby will cause a long painful and difficult delivery. This is not true and it is a harmful belief (WHO, 1981). Even if a mother eats a lot the baby will not grow larger than a certain size. If a mother eats well both she and her baby will be strong and healthy at the time of delivery.

Nutrition is a serious problem, many foods are restricted in pregnancy as harmful including oranges, tomatoes, pumpkin, honey and sometimes green vegetables (Minden, 1992). The postnatal diet is white rice, herb, broth and ghee, everything else legumes, peas, green vegetables, fruit, milk and yogurt is withheld.

The mothers intake of water is severely restricted since it is thought to give the baby stomach pains.(Minden, 1992).

So the community health worker needs to know about all the beliefs and practices concerning food. Inquires should be made from grand mothers, mothers –in-laws and older women in the community. Customs that favor better nutrition should be encouraged and promoted when teaching about appropriate diets. Customs that are bad have to be tactfully discouraged.

In many traditional Hindus communities in Nepal pregnant and lactating women are expected to protect the health of their infants by observing certain food restrictions .A pregnant women among higher cast Brahmins, Chettri and low caste in Baitadi of Western Nepal is permitted to eat the same food as other family members until her 6 months. During her last trimester of pregnancy she is supposed to avoid certain foods which are thought to be harmful to her baby’s health including meat, fish, hot pepper, citrus foods, oily foods and honey.(Malville, N.J., 1987). Severe dietary restrictions are imposed on a women in the community during the first eleven days after she has given birth

According to Shrestha, the new mother should not eat “ salt, meat, vegetables of any kind, fruits, milk products. ”After the purification ceremony on the 12<sup>th</sup> day the mother may eat milk and milk products again but she still must not eat green vegetables, roots and tubers. ,hot pepper ,fruits, meat or dal of any kind for at least 6 months., because it is believed that these foods will harm the nursing. baby. (Malville, 1987). women during this time consists mainly of “rice, buttermilk, curry without salt or spice, roti (unleavened wheat bread) and rice water.” These food rules are strictly

enforced by mothers-in-law, who are concerned for the health of their grandchildren. "In case of previous infant deaths in the family, food restrictions are observed very strictly, and no salt, meat and vegetables are taken for at least two years" (Malville, 1987).

The dietary rules listed above, if strictly observed, would obviously deprive a new mother of many of the nutrients she needs to recover from the nutritional stresses of pregnancy and to produce enough milk to feed a rapidly growing infant. Fortunately, not all Nepali mothers are so restricted in their diet as these women.

#### **2.5.1.5 Gender Discrimination:**

Socio-culturally the Nepalese society is a strongly male dominated and as there is preference for male child. A strong male child preference exists in almost all ethnic group. Religious, social and economic compulsion perceive sons as a very important and valuable person. Daughters on the other hand are seen as financial burden and a social liability. Therefore at levels of poverty, boys have preferential treatment in the family over the girls child. (SMHN, 1994-1997)

A strong son preference in the Hindu religion is reflected by the proverb "where there is the birth of son there is the direct way to go to heaven" so people will be happy if they have a son. If they have a girl child continuously they go on till they have a son child. In Nepal sons are highly valued because Nepalese parents are supported in their old age by their sons. After marriage as girls move away from their families a son is more desirable and the traditional idea that a boy belonged to them and a daughter to someone else is the reason for high status of the son. Another reason

is that sons are needed to maintain the family name. Many families value boys more than girls because boys can contribute more to the family's wealth, support their parents in old age, perform ceremonies after their parents die and carry on the family name. As a result girls are often breast fed for a shorter time ,are given less food and medical care and receive little or no education

According to situation analysis of 1996 sons are economic insurance against the insecurities of old age, the ritually open the gateway to heaven by performing the death rites for their parents and they carry on the family name and legacy.(Situation Analysis, 1990). Daughters however are to be given away in marriage to care for their husband's parents and protect their husband's property therefore at all levels of poverty boys have preference in the family over the girls child (SMHN, 1997).

Poor nutrition is the most common and disabling health problem among women in poor countries like Nepal. Starting in childhood a girl is often given less food to eat than a boy. As a result she may grow more slowly and her bones may not develop properly which may cause difficulty during childbirth. The total work burden of girls at adolescence was found to be 10-12 hours as compared with only 7-9 hours for boys. In most of the surveyed communities after the girl reached adolescence she is expected to take her food after the respected and elders family members as mother- in-laws, fathers -in-laws, sister-in-laws and male members As adolescence ,Nepali girl children face early marriage and pregnancy combined with poor health and inadequate care and the daughter -in-law is always the last and least to eat food. which affect women's nutritional status. Cultural practices place the daughter-in-law lowest in the family hierarchy. Even during pregnancy they often bear the heaviest work loads but get the least food so develop malnutrition and anemia.



### 2.5.1.6. Low Status of Women

The social status of women in Nepal is generally low. Status is the importance that a person has in the family and community. Status affects how a woman is treated, how she values herself, the kinds of activities she is allowed to make. In most communities in the world women have lower status than men. Women's lower status leads to discriminations that is treated poorly or denied something simply because they are women. Discriminations may take different forms in different communities but it always affects a woman's health.

In Nepal similar to many other developing countries women's status in the family and society is still constrained by critical factors for example, by social taboos, economic dependency, low legal awareness, gender bias, son preference female inferiority, weak physique, poor tiresome. Deprived of freedom the family and society. As regarding the son preference in society parents would say by parents " you are daughter, should not be like your brother" so the female child is psychologically depressed in her own family since she is born. So Nepali women had never enjoined free and independent life as a member of her own family. (Country profile in Nepal,1998)

Discrimination due to low status of women against women can also lead them to get pregnant more often because bearing children may be the only way that women can gain status for themselves or their partners. A woman cannot own or inherit properly, earn money or get credit. If she gets divorced she may not be allowed to keep her children or her belongings. Even if a woman has legal rights, her community's traditions may allow her little control over her life. Often a woman

cannot decide how the family's money is spent or when to get health care. She cannot travel or participate in community decisions without her husbands permission. When women are denied power in these ways they must depend on men to survive, As a result they cannot easily demands things that contribute to good health like family planning, safer sex, enough food, health care and freedom from violence.

In poor countries like Nepal many people do not have access to health services of any kind. And because of discrimination against women ,the little money that does exist will not be spent on woman's health needs. So a women may not be able to get good care even if she can afford to pay for it .In many countries the skills needed to care for women are considered special and are provided only by doctor, yet many of the services could be provided at lower cost at the community by trained community health workers so the training to Female Community Health Volunteer is very important in our country like Nepal. As visit to ante natal clinic is only 19 percent and there are 92 per cent home delivery so we can train the FCHV for the health care services which they can perform in the community if we train them.

#### **2.5.2. Enabling Factors:**

Enabling factors are the antecedents to behaviors that facilitate a motivation to be realized. There are the factors which makes the activities possible. These factors attribute the action of any individual or organization including the availability and affordability of health care and community resources. Enabling factors also include new skills that a person, organization or community needs to carry a behavioral or environmental change.

### **2.5.2.1. Availability of Service**

Availability of services are important factor which influence the success of any intervention, as it helps to success the prevention of iron deficiency anemia, as which is a common and widespread public health problem in Nepal. Because iron deficiency anemia (IDA) is one of the contributory factor of maternal mortality and infant mortality .Therefore the high maternal and infant mortality rats of Nepal are a product of the low availability and utilization of health services, the poor health and nutritional status of expecting mothers, inadequate birthing practices and early, closely spaced and repeated pregnancies. Even when health services are available women may not be able to utilize them due to various socio- cultural constraints which pervade many societies in the region, and transportation time and costs are also considerable constraints.

Both maternal and child health survival are closely related to the availability and use of basic maternal health services. The maternal mortality of women who have not received antenatal or delivery care services during and childbirth and the infant mortality of their children is much higher than those who have received care.(A Situational Analysis,1996) Today few women utilize maternal health services in Nepal. The coverage of antenatal services is very low as which is only 19 percent according to Situation Analysis 1996.

The under utilization of health services is due to lack of awareness of available facilities even if they were to use them is lower than that of men, low confidence in health services, inadequate management of these services as there are no facilities or routine test as blood test, stool test. Blood test is done to detect the severity of anemia

and stool test to find out hookworm and other helminthes which is one of the major cause of anemia in Nepal, lack of trained female health personnel and the poor availability of essential drugs as iron tablets which is given during pregnancy to prevent iron deficiency anemia.

The shortage of trained health personnel (especially female at the peripheral level )is also a serious constraints .Incomplete mobilization and the lack of training and motivation of village level health workers including TABs and FCHVs ,also contribute to the problem. So my intervention is to mobilize and train the FCHVs of village of Nawalparasi District regarding the prevention of IDA so that they could be able to provide Nutrition Education to the community especially to pregnant women.

#### **2.5.2.2. Accessibility of Health Services**

Accessibility is an important factors which is influence the success of prevention of iron deficiency anemia in Nepal. Access to health care is important factors that influences women's health facilities or services. Some health posts are far away and are less accessible to the people. The distance can be a major obstacle to obtaining care and that distance can discourage people from even trying to reach there. In general as a distance to a facility increases utilization of its services decreases (Thaddeus,S. and Maine, D., 1990)

A community based survey in India found that women suffer more illness than men but use of health services is less.(WHO, 1998) In Nepal a health post utilization study carried out in one district found that men tended to use health posts more in rural areas while women received traditional care.(WHO,1998) There are many reasons why women are unable to access health care, even in times of great

urgency. To begin with health services may not be available. In many rural areas and particularly in difficult to reach terrain, health centers are often far and far between. Adequate referral services and institutional facilities are scarce or far away.

Women's access to health services is constrained by several factors. First, the time spent on child care, household work and in a job leaves them with little time to think about their health, often resulting in neglecting their illness in the early stages. Second the clinics offer women no privacy. Third, most clinics are staffed by men health personnel and women show a great unwillingness to be treated with them (WHO-1998). In general access is related to a woman's social status as determined by her level of education, income and decision making power within the family.

In Nepal about 53 percent of the total population lives in the hills and mountains. Because of the terrain, transportation and communication facilities in this region, it is difficult to reach the health institutions. In some places people have to walk 3-4 hours to reach the health facilities which is very costly to their family because they have to earn the money in the same days for fooding. It often takes as many as five days to visit all the communities of one village development committee (VDC). A study shows that long distance was the main reason for not coming the health care services (Niraula, 1996). There is low utilization of health services due to lack of awareness of the availability and importance of maternal health care, on difficult access to health services especially in the hill and mountain areas, and in women's low confidence in health services due to lack of supplies, inadequate staff and a low proportion of female health workers at sub-health post, health post and hospitals. So in this context training to female community health volunteer (FCHV) regarding the prevention of iron deficiency anemia is most vital because after the training that they could be able to give nutrition education to every family members

in the community in all regions as terrain, hills and mountains because every village has 9 wards and each ward has one female community health volunteer so I am going to train 18 FCHVs from 2 villages of Nawalparasi district.

### **2.5.2.3. Affordability of Services**

Affordability means able to buy or pay. Utilization of health services in Nepalese society is found to be very low. It is affected by many factors such as availability, distance, costs, quality of care, social status and health beliefs. In Nepal majority of the rural population are estimated to be living below the poverty line. More than 70 percent of the people are under absolute poverty. So it was found that quite a large number of rural women do not go to the health centers or hospitals.

Women's access to health services is constrained by the factors as the expenses and time taken in travelling long distance and in meeting clinic and drug fees are also constraining influences. Most of the female in focus group discussion have reported that they cannot themselves decide to seek health services. The decision is made by their husbands or seniors members of the households as mother-in-law (Rajbhandari, B and Rajbhandari, R.)

Several studies have shown that households discriminate against girls in terms of health care. Hospital records show more male admission than females. Studies have shown that girls are taken to less qualified doctors than boys, more money is spent on the treatment of boys rather than girls.

### **2.5.3. Reinforcing Factors**

Reinforcing factors are those achievements which determine whether the actor receives positive (or negative) feedback and support for a behavior including its repetition. Re-enforcement may come from an individual or groups from persons or institutions in the immediate environment or from society. For example in a smoking cessation program an actor can get reinforcement in the form of social support from peers, spouse, health care providers. Thus re-inforcing factors include social support from peers, spouse, health care providers

#### **2.5.3.1. Mass Media**

There is a low use of mass-media by the pregnant women due to poverty and high illiteracy in Nepal. Female literacy rate is only 25 percent and a large majority of people continue to live in poverty, depending on agriculture, low income having less food available. Women is the one who suffers most and not access to the facilities of any. Health information education and communication is one of the basic component for the successful implementation of any health education program. IEC are intended to provide different information related to the health problem and encouraged the people to adopt health behavior for the prevention and control of that problem

The common information education and communication (IEC) materials for the prevention of IDA include print materials like Pamphlets , Posters, Flip charts ,Wall charts and booklet for mothers which are distributed up to the village health facilities. But the programmers are not sure about proper distribution of and access of these materials in the community level up to the targeted population study carried out by the MOH in 200 Sub Health Post revealed that only 5 percent of women read

newspapers once a week once a week, 12 percent watch television and 36 percent listen radio. Only 3 percent of women are exposed to all three media (Pradhan, et al,1996,. There is a close relationship between the level of education and exposure to various mass media. Women with no education have no exposure to all three media.

The messages related to IDA are services are provided through Radio Television and News papers The reach of these media in the rural and remote areas of the country is limited.

### **2.5.3.2. Peers Group**

In Nepal the behavior of pregnant women are influenced by the peers group The friends and neighbors can influence to take services from the health centers A study done by Pradhan at el,1996 shows that using of health facility by women is 34 percent by the advised of their husband, 20 percent of women are affected by their peers .18 percent by health personnel and 7 per cent by other relatives.

### **2.5.4. Non –Behavioral cause**

#### **2.5.4.1.Hookworm**

Iron deficiency anemia (IDA) affects huge numbers of women around the world. Pregnancy and delivery are less likely to go smoothly if a women is anemic. Hook worm infection is a major contributor to iron deficiency anemia in women of childbearing age in many developing countries.(WHO, 1991) It is prevalent throughout the tropics and subtropics wherever there is fecal contamination of the environment and is acquired mainly by skin contact with contaminated soil or vegetation. In Sarlahi district of Nepal the prevalence of hookworm infection is



among rural pregnant women was found to be 78 percent of which 24 percent had moderate to heavy worm loads.

In hookworm infestation is quite prevalent in rural area and responsible for high incidence of iron deficiency anemia. An important cause is loss of iron due to hookworm infestation leads to continuing hemorrhage in the intestine, (Karmacharya, P.L. 1991) Adult hookworm live in the duodenum and jejunum, attached to the intestinal mucous from which they suck blood, causing chronic blood loss. In people whose body iron stores are already depleted, hookworm infection can give rise to iron deficiency anemia in just a few weeks, especially during pregnancy, when iron requirements are increased (WHO, 1991)

According to WHO expert group report fecal blood loss due to hookworm is about 0.03ml per worm per day and 2.1 ml per 1000 eggs per gram of faeces. It is concluded that it would result in an intestinal hemoglobin iron loss of about 5mg per day of which about 70-80 percent would be eliminated in feces. It concluded that infection with more than 5000 egg would cause an imbalance in iron metabolism and lead to iron deficiency anemia. (Karmacharya, P. L., 1991) There is some evidence that a number of parasites can interfere with the absorption of some nutrients, particularly if the worm load is heavy; this has been shown to Giardia, which reduces iron absorption.

#### **2.5.4.2. Malaria**

Malaria is a major factor causing severe anemia in pregnancy. Malaria causes destruction of red blood cells and contributes to the prevalence of anemia.

Longitudinal studies have shown that parasite infection rate are greater in pregnant women as compared to non-pregnant women .Several studies have shown that protection against malaria contributes to the prevention of anemia in pregnancy, thus high lighting the importance of chemoprophylaxis and other methods of malaria control in reducing maternal morbidity and mortality(WHO, 1991) Malaria is associated with an increased incidence of low birth weight ,premature delivery and stillbirths. The adverse effects of malaria on maternal and fetal well being are for the most part due to the associated severe anemia.

### **2.5.5. Behavioural Factors**

#### **2.5.5.1. Iron Rich Foods**

Iron is of great importance in human nutrition and diet is the most important factor determining iron status. Iron is essential for the formation of haemoglobin of red blood cells. Iron deficiency is mainly nutritional in origin. The adult human body contains between 3-4 gram of iron of which about 60-70 percent is present in blood (Hb iron) as circulating iron and rest 1-1.5 gram as storage iron. Each gram of haemoglobin contains about 3.34 milligram of iron(Park, K, 1994).

#### **2.5.5.2. Types of dietary iron**

There is two types of iron present in foods: Haem-iron and non-haem iron. Haem iron is better absorbed than non haem iron. Foods rich in haem-iron are liver, meat, poultry and fish. They are not only important sources of readily available iron but they also provide the absorption of non-haem iron in plant foods eaten at the same time(Park,K, 1994) Foods containing non –haem iron are those of vegetable origin, e.g. cereals, green tubers, leafy vegetables, legumes, nuts, oilseeds, dried fruits,

sprouted seeds .They are important sources of iron in the diets of a large majority of Nepali people.

The nutritional status of the Nepalese people is very poor. Nutritional status is the state of an individual and is determined by every day intake of food. The major nutritional problem in Nepal is iron deficiency anemia which is the cause of effect of low intake of locally available iron rich foods. In Nepal more than 75 percent of the pregnant women are anemic and may benefit from increase consumption of iron rich foods.( Adlikari and Krantz,1997)

Iron rich food s which are locally available and affordable in Nepal are green vegetables, whole grain cereals as millet, buckwheat, pulses, bitten rice, soyabeans, sprouted seeds, dried formented green leaves “Gundruk” and dried dal-tuber mixture “Masewra”. Due to lack of knowledge about the nutritive values of these various types of locally available foods by the poor Nepalese people, they are not consuming in enough amount .So Nutrition education regarding these nutritive values the community people is very important. So as FCHV is very important grassroots level health volunteer, we have to mobilize them so my intervention is to train FCHVs of 2 villages of Nawalparasi District ( that will be 18 FCHVs) regarding the iron deficiency anemia and its prevention so that they could be able to provide Nutrition education to the community people especially to pregnant women to reduce the iron deficiency anemia.

#### **2.5.5.3. Iron Absorbent Foods**

Iron absorbent foods are haem iron which is found in animal origin such as meat , fish, and poultry .People in developing countries derives most of their iron

from non-haem iron sources, whereas those in industrial countries consume greater amounts of haem iron. So absorption of non-haem iron can be improved up to 18 percent (De Mayer, 1989) by the addition to the diet of containing vitamin C, the addition of to the diet of foods containing haem iron or the removal from the diet of substances that inhibit iron absorption (De Mayer, 1989).

In general the Nepali diet includes little meat where people are poor and cannot buy and eat them regularly except in festivals as Desain, when goats, chicken and other animals are ritually killed and eaten. The non-haem iron is poorly absorbed so this is the reason for the prevalence of iron deficiency anemia in Nepal. In Nepal where meat consumption is very low, vitamin C is the most important enhancer of iron absorption. The addition of as little as 50 mg of vitamin C to a meal can double iron absorption. This could be provided by an orange, papaya and mango.

So in Nepal where people are poor and cannot eat meat except in festivals so the community people should be given knowledge through Nutrition education by trained FCHVs regarding the increase intake of locally available cheap iron absorbent foods, "vitamin C" with non haem iron. The locally available vitamin C foods are amala, orange, guava, papaya and mango. Therefore FCHV of each village should be trained to give nutrition education to the community people. The role of the FCHV is mainly focused on motivation and education of local mothers and community members for child care at home, family planning nutrition and sanitation

#### **2.5.5.4. Iron Inhibiting Foods**

The Nepali diet which is vegetarian contains large amounts of inhibitors, e.g. phytates, polyphenols and tannins which inhibit iron absorption (WHO, 1991)

Phytates are present in wheat , maize, rice. Even small amounts of phytate markedly reduce iron absorption, tannins which are present in tea and coffee and other polyphenols found in nuts and legumes also inhibit iron absorption. (De Maeyer, 1989) The inhibitory effects of phytates and polyphenols can be counteracted by adding vitamin c to a meal .In developing country like Nepal cooking foods in iron pots, especially vegetable soups and can increase the iron content of a meal. So the community people should be advised to consume vitamin c foods to prevent the inhibitory effects of iron absorption and not to drink tea or coffee after foods as which inhibit iron absorption.

## **2.6.Possible Strategies To Reduce Iron Deficiency Anemia**

### **2.6.1 Iron Supplementation**

Iron supplementation with its objectives of providing absorbable iron to the target population is currently the most common strategy for the control of iron deficiency in many developing countries (WHO, 1994) India, Nepal and Sri-lanka have a national iron supplementation for anemia control for pregnant women which is implemented through the primary health care outlets. Studies from developing countries suggest that 120 mg iron and 2mg of folic acid are the daily doses needed to prevent anemia in pregnant women(WHO, 1991).Iron tablets are targeted to the pregnant women ,starting as early as possible in pregnancy but providing at least 90-100 tablets in one pregnancy (WHO, 1996)Supplementation should occur from during the second half of pregnancy when the iron requirements is greatest

While currently supplementation is mostly employed for the treatment of existing iron deficiency anemia, supplementation should be designed primarily as a

preventive public measures (preventive supplementation ) among the populations at high risk of anemia ( WHO, 1994) The greatest obstacle to iron supplementation is poor compliance with treatment (WHO, 1991) This is often due to side effects of drugs and also from women's lack of awareness that they have a real need for iron during pregnancy .So women must be convinced of the importance of iron for their health and the health of their unborn child.

In Nepal lack of compliance with the supplementation programs by pregnant women has been identified as a major cause of the poor performance of these programs. An irregular and inadequate supply of supplements and lack of health functionaries are also reported.

#### **2.6.2. Increase Compliance to oral supplementation**

The effectiveness of supplementation program is constrained by the problem of non-compliance. A woman's belief system ,her perception and knowledge about health ,greatly influence her decision to follow through with a prescribed preventive or treatment regime. For example many pregnant women in India and Thailand believe that taking iron and vitamin tablets will cause them to have big babies and thus difficult deliveries and they therefore resist iron supplementation .In other societies , iron is perceived as having "heating " qualities and since pregnancy is considered to be a time of increased body heat ,it is believed that taking iron pills could cause "overheating and induce abortions" ( WHO, 1991)

Side effects of oral iron which include epigastric discomfort, nausea ,vomiting, constipation or diarrhea are another factor affecting compliance. The

frequency of side effects is directly related to the dose of iron and thus the amount absorbed. The most effective dose of iron in high prevalence countries, 120mg daily is more likely to produce side effects than a lower dose, and thus more associated with non-compliance. Many health workers who prescribe iron therapy are themselves unaware that anemia adversely affects pregnancy outcome. There is thus a need to teach health workers that anemia prevention should be one of their priorities and to give them communication skills to enable them to persuade women to take iron supplementation. Because of the problem of compliance with regular oral iron supplementation, parental. Iron therapy is being considered as a possible alternative measure. Supplementation programs may be relatively unsuccessful because of poor compliance by pregnant women. This may be associated with poor understanding of the need to take tablets, especially if women are feeling well. Tablets may be also be passed on to others, rather than taken by women themselves, either for financial gain or because other family members may appear ill. Side effects of the drugs may also reduce compliance. This highlights the importance of the antenatal staff. Community health workers and in particular FCHVs also have an important role in health education. There is a need for posters, slogans, TV and radio messages in terms of prevention of iron deficiency anemia.

### **2.6.3. Malaria Control**

Malaria may be an important contributor to severe anemia in pregnancy. Chemoprophylaxis has been shown to abolish parasites and to prevent anemia and it is not started before the 19<sup>th</sup> week of pregnancy. It has been suggested that all pregnant women in endemic areas should have a curative dose of chloroquine on their first prenatal visit (600mg base at once, 600mg on the second day and 300mg on the third)

followed by daily Proguanil (100mg/day, ) for the duration of pregnancy. This as a specific recommendation for Africa and was successful when used in Northern Nigeria. Other methods of malaria control should be used such as the use of bednets (WHO, 1991)

#### **2.6.4. Control of other parasitic infections**

Control and treatment of parasitic infections is important, particularly hookworm infection (which can contribute of iron deficiency through chronic blood loss), and other parasites that interfere with the absorption of nutrients such as giardiasis. Where women are exposed to heavy infection, albendazole or mebendazole could be given after the second trimester because there is some risk to the fetus especially in the first trimester. For the prevention purpose use of cheap footwear, improvement in sanitation and personal hygiene and use of safe drinking water should be improved.

#### **2.6.5. Adequately train antenatal staff**

Antenatal clinic staff should understand the basic principles with regard to the prevalence, etiology, prevention and treatment of anemia in pregnancy and should be aware of the particular circumstances in their local area which may have an impact on anemia prevalence.

Adequate local training programs are of vital importance on producing staff with sufficient knowledge and motivation to put local schemes into practice. It is also important that staff, especially in rural areas, be adequately supported in terms of regular supplies of drugs and regular supervisory visits by senior staffs. Serious



consideration should be given to the involvement of the local health workers such as the Community Health Workers such as the Female Community Health Volunteers and the Traditional Birth Attendance.

### **2.7. Role of the FCHV related with the family.**

There is an existing system in which each and every FCHVs are having close contact with pregnant women, only lacking till this period is FCHVs are not trained on IDA. When we provide them training on anemia and the preventive measures of anemia, definitely, FCHV will transfer their knowledge to the pregnant women. Most of the FCHVs are having very good value (good status) in the community, even older women as well as high cast old women also pay respect and listen to the FCHVs. If we could request to the FCHVs while delivering nutrition education among pregnant women on the same time we can include mother-in-law. So that nutrition education can take place in the mother-in-law as well as target group, on the otherhand, can expect positively in the decision making process in the kitchen.

The methodology of health education given by FCHVs is individual contact method which seems very effective. If we could request to FCHVs to follow individual contact as well as group contact (family contact) method. So that mother-in-law, husband as well as other member of the family also can be benefited through her education and help to increase in the consumption of locally available foods among the family.

### **2.8. Intervention: Nutrition Education With Dietary Modification**

Dietary modification is an important way of decreasing the incidence of nutritional deficiency, though this may be difficult due to the limited purchasing

power of a household and problems in persuading people to change long established dietary habits. Increased consumption of normal foods so that energy needs are met can increase iron consumption. Such a strategy in rural India increased total iron consumption by 25-30 percent.

In many communities in Nepal vegetables and fruits are eaten only infrequently and in small amounts because of not knowing its value. Persuading families to add these foods to their diet can have a considerable impact on iron absorption. Pregnant women should be encouraged to increase their intake of pulses and green vegetables. Prolonged cooking of vegetables should also be discouraged as this destroys much of the vitamin C and folic acid content nutrition education should stress this and teach ways of avoiding it. Health workers should also stress the importance of reducing tea and coffee consumption, particularly during meal. To do the dietary modification of the community people Nutrition education is important and required. So nutrition education in terms of the prevention of iron deficiency anemia is one of the vital importance in changing the dietary habits of rural people in consumption of iron rich and iron absorbent foods to prevent the incidence of iron deficiency anemia in Nepal. Iron deficiency anemia is widely prevalent in Nepal, is most common due to iron deficiency in the diet which is one of the major contributors to the high infant and maternal mortality rate in Nepal(Situation Analysis, 1996).

Nutrition education includes increasing the consumption of locally available iron rich and iron absorbent foods and also includes the availability of the food supply through the kitchen garden to protect the health of the family. So Female Community Health Volunteer should be prepared to provide nutrition education to the community

So my intervention is to train Female Community Health Volunteer in terms of prevention of iron deficiency anemia so they could be able to give and provide nutrition education to the people of the community.

## **2.9. Female Community Health Volunteer Program**

The Female Community Health Volunteer program (FCHV/P) was developed during 1986/87 in order to promote community involvement in the Primary Health Care (PHC) Program. A local women is recruited at the ward level with the concept of involvement of local mothers' group. The FCHV is selected by mother's group is trained on Primary Health Care components and is supposed to work as volunteer for health program at the ward level. The overall goal of the program is to reduce the child and women related health problems (MMR/IMR) through active participation of trained women volunteers.

FCHVs are the most important health persons in the overall MOH service delivery strategy. With TBS, they are the only health workers who provide routine direct contact at the family level. FCHVs are local women who are trained for a brief period of time (two weeks training) and supervised by health post staff. Working with health post and sub health post staff, the FCHV is expected to promote the utilization of immunization, family planning, ORT, nutrition, first aid and antenatal care at the family level, both in the home and through women's groups. FCHVs provide monthly reports to Village Health Workers (VHWs). Although FCHVs are considered the key to bringing primary health care services and information to the home, the program has had mixed success. (Situation Analysis, 1996) There is a high achievements in immunization coverage and treatment of diarrhea with Oral

Rehydration Solutions (ORS) but low achievements in the field of nutrition and sanitation programs.(FHD-MOH, 1997) Therefore my intervention is to provide additional training on nutrition regarding the prevention of IDA so that they will provide the nutrition education to the pregnant mothers and I conclude that the prevalence of iron deficiency anemia will be reduced.

## **2.10 Conclusion**

Iron deficiency anemia(IDA) is a widespread and most common form of iron deficiency anemia. The most affected population groups are women especially when pregnant. Some of the causes of IDA are a shortage of available iron in the food eaten or the presence of food factors which decrease absorption, loss of blood due to hookworm infestation or in women due to menstruation. Severe anemia during pregnancy is associated with an increased risk of maternal and fetal morbidity and mortality. Among anemic pregnant women the percentage of abortion, premature delivery, stillbirth and low birth weight is greater than among the non-anemic and some studies show low iron stores in babies of anemic mothers. IDA increases individual's susceptibility to infection. It is also well known that anemia diminishes the capacity for physical labor. Consequently anemia can be a serious health and social problem for any country.

Different people in Nepal are living at different altitudes having unequal facilities of health, transport, education, etc. Because of this they have to depend on locally available food stuffs. In addition ,lacking knowledge ,they do not know how to make proper use of what s available and are therefore prone to develop nutritional anemia .Women's iron requirements increases during pregnancy and in normal

delivery some blood is lost ,additionally increasing the iron requirement. Women with subsequent pregnancies are at greater risk. Adequate supplementation of iron is required to raise hemoglobin levels and ensure that women can cope with the risks of delivery. When women is anemic, even a small blood loss during delivery can increase the risk of mortality, so that is why IDA is one of he major contributors to high maternal mortality rate in Nepal.

For cultural and economic reasons many Nepali women eat little meat and green vegetables. With limited exposure to prenatal health care most women have little access to iron supplementation, So therefore my intervention is to train the FCHVs regarding the improvements and more consumption of locally available iron rich and iron absorbent food so that they will give nutrition education to the pregnant women. FCHVs are the main PHC service providers in the community. Different studies have shown that FCHVs if provided additional training and skills can improve better Diarrheal disease, Acute respiratory infection and vitamin A program. Therefore we can conclude that the FCHVs if additionally trained on IDA component will provide better nutrition education to the pregnant mothers in improving knowledge and modifying beliefs and culture and practices, thereby increasing the consumption of iron rich and iron absorbent foods.

## REFERENCE

- Adhikari , R.K., & Krantz, M.E. (1997). *Child Nutrition and Health, Health Learning Materials Center, T.U. Institute of Medicine.* pp. 19-23, 156-185.
- Ahmed, A., (1993). *Socio-cultural factors affecting women's role and status as well as fertility and reproductive health: Policy and program implications:* SAARC Ministerial Conference on Women and Family Health: Kathmandu Nepal. pp. 1-6.
- Burns, A.G., Lovich, R. Maxwell, J.& Shapiro, K. (1997). *Where women Have No Doctors : A health guide for women.* Berkley California: The Herperian Foundation pp.6-8, 165-173.
- Central Bureau of Statistics. (1996). *Statistical Pocket book Nepal.* National Planning commission Secretariat, HMG: Nepal.p.46.
- Dayal, . (1985). *Women in Health and Development in South –East Asia:(SEAR).* World Health Organization, New Delhi. pp. 1-59.
- DeMayer, E,M., (1989) *Preventing And Controlling Iron Deficiency Anemia Through Primary Health Care: A Guide For Health Administrators And programme Managers,* WHO, Geneva.
- Department of Health Services, (1995). *Annual Report. His Majesty's Government of Nepal,* Ministry of Health, Department of Health Services, Planning & Foreign Aid Division. pp. 19-29.
- Department of Health Services, (1995). *Annual report of Department of Health Services.* Ministry of Health, Nepal.

- Family Health Division, (1994). *Safe Motherhood Program in Nepal*. A National Plan Of Action. Department of Health Services, Ministry of HMG of Nepal. pp.1-52.
- HMG/UNICEF/WHO/((1984). *Joint Nutrition Support Programme in Nepal*: Author.
- Karmacharya, P.L.(1991). *A Study of Haemoglobin level and Other Associated Factors Among Married Women Aged Between 15-45 Years in Dadu Majra colony, U.T.Chandigarh, Punjab University,India*. pp.1-20.
- Kaplan, R.M.,Sallis,J.F. and Patterson,T.L.(1993). *Health and Behaviour*, New York. pp. 56-58.
- Longman. (1991). *Dictionary of Contemporary English*. (13th ed.). English.
- Malla, D.S. (1996). *Adolescent pregnancy and its outcome*. Maternity hospital, Thapathali, Kathmandu ,Nepal. pp. 1-5
- Malville, N.J. (1987) *Iron deficiency Anemia among Village women of The Middle Hills Of Nepal*, University of Colorado, Department of Antropology.
- Majupuria,I. (1996). *Nepalese women*, Bangkok: Techpress Books.
- Ministry of Health. *His Majesty;s Government of Nepal, New ERA*, Kathmandu, Nepal.,Macro International Inc., Calveton, Maryland, USA ,pp. 149-155.
- Minden, M. (1992). Miss we cannot read and write. *World Health*, Special Issue . pp. 36-37.
- National Health Education, Information and Communication Center. (1996).*The National RH/FP IEC Strategy for Nepal, A 1977-2000*. Department of Health Services, Ministry of Health, Kathmandu, Nepal. pp.26-30.

National Planning Commission /HMG/ UNICEF, (1992). *Children and Women of Nepal, A SituationL Analysis*. HMG of Nepal.

National Planning Commission /HMG/ UNICEF, (1996). *Children And Women of Nepal, A Situational Analysis* HMG of Nepal.

Niraula, B.B. (1994) Use of health services in hill villages in central Nepal *Health Transition Review* 4: pp.151-166.

Park. K. (1994). *Park's Text book of Preventive and social medicine*. (14<sup>th</sup> ed) Premnagar, Jabalpur, India, Banarasides Bharat Publishers. pp.345-356.

Pradhan,A., Aryal, RH.Regmi, G.R.,Ban., B and Govindasamy,P. (1997). *Nepal Family Health Survey*, Family Health Division, Department of Health Services, pp.149-156.

Rajbhandari, B. & Rajbhandari, R.(1998). *Women's Reproductive Health Problems in Rural Nepal: Women's Health program* Kathmandu, Nepal. pp. 1-4, 22.

Regmi,S.C.,& Adhikari,R. (1994). *A Study On The Factors Influencing Nutritional States Of Adolescent Girls*, New ERA: Kathmandu, Nepal. pp..1-13.

Sims J., ( Compiled by) (1994). *Women, Health & Environment*. WHO, Geneva. pp.35-48.

UNICEF., (1996). *Atlas of South Asian children and women*. Kathmandu, Nepal: UNICEF Regional Office For South Asia Regional office for South Asia: pp.4- 16.



- Valley Research Group.(1997).*Assessment of Female Community Health Volunteer Program*. Unpublished report submitted to Faculty Health Division Department of Health Section , Ministry of Health Kathmandu Nepal.
- World Health Organization. (1998). *Access to health care, Regional Health Report: Focus on women*. WHO, New Delhi. pp. 33-41.
- WHO.(1996). *Control of Iron Deficiency Anemia in South East Asia*: Report of an Intercountry Workshops Institute of Nutrition, Mahidol University Salaya,Thailand, Dec. 1995 SEA/INT/134, New Delhi:WHO, pp. 1-32.
- World Health Organization. (1994). *Mother baby package. Implementing safe motherhood in countries*, Division on Family health, WHO, Geneva. pp. 1-34.
- WHO. (1992). *The Prevalence of Anemia in women* (2<sup>nd</sup> Ed). Geneva: Autho. pp. 1-3, 16.
- WHO. (1991) *Prevention and management of Severe Anemia in Pregnancy: Maternal Health and Safe Motherhood* programme, Geneva: Author.
- WHO. (1993) *The health of young people* , A challenge and a promise. pp. 12-25.
- World Bank. (1996). *Improving Women's Health in India* Washington D.C. pp. 1-66.