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Nutritional status of pregnant women and lactating mothers of Jhalari Pipaladi Municipality of Kanchanpur district of Nepal

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ABSTRACT

Background: Maternal malnutrition during pregnancy has been associated with adverse outcomes, including increased risk of maternal and infant mortality, as well as low birth weight newborns (<2,500 grams) — a measure that accounts for preterm birth and intrauterine growth restriction of the fetus. In particular, malnutrition among women is likely to have a major impact on their own health as well as their children's health. More than 3.5 million women and children under age five in developing countries die each year due to the underlying cause of under nutrition

Objectives: The overall objectives of the study were to assess the nutritional status of pregnant women and lactating mothers

Methodology: A cross sectional descriptive study was conducted in Jhalari Pipaladi Municipality of Kanchanpur district. Wards were selected randomly and data were collected through snow ball sampling process. The total 227respondents were selected by convenience sampling. Nutritional status was measured through the MUAC tape and BMI. The association with the nutritional status and fluid intake, nutritional status and daily food intake pattern, health care visitors and nutritional status and smoking habits and nutritional status which were calculated through the Chi-Square test with the significant level of 0.05.

Result: According to the BMI 33.9 % of pregnant women were normal, 47.1 percentages were under nutrition, 13.2 percentages were at risk and 5.7 percentages were overweight. According to the MUAC 35.2 percentages were normal, 27.8 percentages were at risk, 7.9 percentages were obese and 29.1 percentages were under nutrition. Thus it is seen that there is a great risk of malnutrition among the pregnant women and lactating mothers of Jhalari Pipaladi Municipality of Kanchanpur. As per as the finding 0.9 percentages respondent have poor level of knowledge, 29 percent of the respondent have good level of knowledge and 70.1 percentages have

Conclusion: There seems to be need of regular monitoring of the nutritional status of the pregnant women and lactating mothers of the Jhalari Pipaladi Municipality. The identification of nutritional status and related factors allows interventions directed to the real needs of pregnant women and lactating mothers, aimed at healthy and quality of life for all.

Key Words: Obesity, under nutrition, pregnant women, lactating mothers, Mid Upper Arm Circumference (MUAC) , Body Mass Index (BMI)

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Chapter I

1. Introduction

1.1. Background

Pregnancy generally refers as the condition of a woman or female mammal from conception until birth. Generally Lactation describes the secretion of milk from the mammary glands and the period of time that a mother lactates to feed her young. The process can occur with all post-pregnancy female mammals, although it predates mammals. In humans the process of feeding milk is also called breastfeeding or nursing. (Global, 2004) Pregnancy is associated with increased nutritional needs due to the physiologic changes of the woman and the metabolic demands of the embryo/fetus. Proper maternal nutrition during pregnancy is thus imperative for the health of both the woman and the offspring. Maternal malnutrition during pregnancy has been associated with adverse outcomes, including increased risk of maternal and infant mortality, as well as low birth weight newborns (<2,500 grams) — a measure that accounts for preterm birth and intrauterine growth restriction of the fetus (Drake, 2011).

Under nutrition and poor health from preventable causes disproportionately affect the well-being of millions of people in the developing world. Factors at individual, household and community level, or a combination of these factors, may contribute to poor nutrition and health status. In particular, malnutrition among women is likely to have a major impact on their own health as well as their children's health. More than 3.5 million women and children under age five in developing countries die each year due to the underlying cause of under nutrition (Huffman, Baker, Shomann, & Zahner, 1999).

Women are more likely to suffer from nutritional deficiency than men for several reasons, including their reproductive biology, low social status, poverty and lack of education. In addition, socio-cultural traditions and disparities in household work patterns can also increase women's chance of being malnourished. Between 5 to 20 percent of women in various developing countries are underweight. Many African women display low weight-for-height as measured by a body mass index of less than 18.5 (Ronsmans C, 2008).

Women in low-income settings often consume inadequate amount of micronutrients because of resource limitation. They have a limited intake of animal source foods, fruits and vegetables. Intake of micronutrients less than the recommended values increase women's risk of micronutrient deficiencies. Adequate nutritional status of women is important for good health and increased work capacity of women themselves as well as for the health of their offspring. (Morsy & Alhady, 2014)

Severely malnourished mothers have reduced lactation performance contributing to the increased risk of child mortality. Nutritional requirements during lactation are greater than during pregnancy. If a mother is well nourished during pregnancy, she will have adequate fat and other nutrient reserves that can be used to compensate partially for her additional requirements. Mothers should be counseled about the need for an adequate diet in order to achieve optimal lactation and sustain it without depleting their own nutrient stores. Particular attention should be given to intakes of protein, calcium and vitamins (Huffman, Baker, Shomann, & Zahner, 1999).

Lactating mothers from low-income settings are considered as nutritionally vulnerable group. Due to the nursing process mothers are subjected to nutritional stresses. Frequent pregnancies followed by lactation increase the health risk of mothers resulting in a high maternal mortality. A nursing mother produces 0.7 to 0.8 liters of milk per day, containing 330 milligrams of calcium per liter. This requires an extra energy expenditure of at least 500 calories per day. The quality of breast milk is only affected in extreme cases of deprivation, or by excessive intake of a particular food. But the quantity of milk depends very much on the mother's diet. Food absorbed by a nursing mother not only fulfills her own nutritional needs, which are greater during the postnatal period, but also enables her to produce milk (Black, et al., 2008).

Research based information regarding maternal nutrition from the study communities is lacking. Information on the feeding practices, nutritional status and associated factors of the lactating women are urgently needed for prioritizing, designing and initiating intervention programs aimed at improving maternal nutrition. (Takimoto & Gynaecol, 2003) The process for priority setting should start with the assessment and analysis of the situation that lactating women face in their environment. Thus, this study was carried out to provide information regarding the feeding practices, nutritional status and associated factors of the lactating women in the study area. (Black, et al., 2008)

1.2. Statement of problems

Women of reproductive age continue to be affected by underweight and short stature in Nepal. Typical of other South Asian countries, early marriage and childbearing is not uncommon (more than a third of women begin childbearing by 19 years of age). (MOHP, 2013)

Anemia affects 35% of all women (close to 48% of pregnant women), only decreasing one percentages point between 2006 and 2011; however, Nepal demonstrated a huge reduction in anemia prevalence among women between 2001 and 2006 (from 68% to 36% of all women) (Drake, 2011).

Hookworm infestation may be a particular driver of iron deficiency and anemia in Nepal, particularly in the Terai, where one study found that 75% of pregnant women had hookworms, 73% were anemic, and 88% of anemia cases were due to iron deficiency. (malaria hook worm and vitamin A defficiencies in Nepal, 2000) . According to the NDHS report 2011 although, in the same study 54% had vitamin A deficiency and 20% also had malarial parasites, both of which can also contribute to anemia. As a result of high maternal malnutrition levels, 12% of children are born with low birth weight. 18% of the pregnant women are under weight in Nepal

where as 13% of the women are overweight in the Nepal according to the DHS survey report of 2011. The reproductive age group women(15-49) were 20% underweight during the 2011.47.6% of the pregnant and 33% of the lactating women are suffering from the anemia in Nepal. (nutritional status of Nepal, 2011)

According to the demographic health survey of 2011 the women in the reproductive age groups(15-49) are quite malnourished i.e 23.7% of the women are having the BMI <18.5 and 5.4% BMI<17.5. (Nepal Demographic and Health Survey (NDHS) 2011, 2011)

1.3. Rationale of study

Nutritional status of pregnant and lactating women is essential to know. As our country being underdeveloped and prone toward the disaster. According to UNICEF, each year, more than half a million women die from causes related to pregnancy and childbirth. Nearly 4 million newborns die within 28 days of birth. (ransom & Elder, 2003) . Many of the 200 million women who become pregnant each year, most of them in developing countries, suffer from ongoing nutritional deficiencies repeated infections and the long term cumulative consequences of under nutrition during their own childhood. (Black, et al., 2008)

This study is done to find out the nutritional status of the pregnant women and lactation mothers. The lactating mothers of hilly reason are not getting proper iodinated salt. About 41.6% are only getting salt that contain iodine. Similarly in the Terai reason 62.4% are getting salt containing iodine (Nepal Demographic and Health Survey (NDHS) 2011, 2011).

Women in Nepal are generally of short stature. According to the 2011 NDHS, 12 percent of women in Nepal are less than 145 cm, a sign of chronic under nutrition (MOHP, 2013).

By identifying older persons who are malnourished or at the risk of malnutrition either in the community or society settings, the MNA allows to intervene earlier to provide needed nutritional support and prevent further health problems.

Till now very few of the study are being done in Nepal in context of pregnant and lactating mothers nutritional status. Through the help of this research the maternal and child status of Nepal will able to get the beneficial in the context of the nutritional status.

This study will definitely help to the government of Nepal for finding the situation of nutritional status of pregnant women and the lactating mothers.

1.4. Operational definitions

Nutritional status: A measurement of the context to which the physiological needs for nutrients of the individual are met In this study, the anthropometric measurements for height, weight and

as well as dietary intake were used in order to evaluate the nutritional status of the pregnant women lactating mothers with the BMI value 18.5 to 24.9 and MUAC 23cm-33cm.

Malnutrition: less than 18.5 BMI , MUAC less than 23cm

At risk of malnutrition: near or equals to 18.5 MUAC near or equals to line of 23cm

Obesity (obese): the BMI value above 25 or MUAC over 33 cm

Malnutrition: the condition in which body hasn't get enough of nutrition for normal functioning

Nutritional knowledge: This is the understanding of different type's off Food and how food nourishes the body and influences health.

Associated factor: the factor that has contribution for occurring of malnutrition

Lactation: the process of giving milk of mother to the child

Pregnant women: the condition of developing the baby on the body of women.

Nutritional Knowledge level criteria:

0-4: poor level of knowledge

5-8: Good level of knowledge

9-12: very good level of knowledge

1.5.Objective of study

General objective:
To assess the nutritional status of Pregnant women and lactating mothers

Specific objectives:
   I.   To measure the anthropometric measurement of Pregnant women and lactating mothers
  II.   To find out the nutritional food consumption status of pregnant women and lactating women
 III.   To identify the nutritional level of knowledge on Pregnant women and lactating mothers
 IV.   To find out the associated factors related to nutritional status of pregnant women and lactating mothers.

1.6.Research questions
   ❖ What is the nutritional status of pregnant women and lactating mothers in Jhalari Pipaladi municipality?
   ❖ What is the level of the nutritional knowledge in the pregnant women and lactating mothers?

❖ What are the associated factors related with the nutrition?

Variables

Independent variable

- ❖ Age
- ❖ Ethnicity
- ❖ Pregnant women
- ❖ Lactating mothers(baby up to 6 months of breast feeding)
- ❖ Education
- ❖ Income
- ❖ Occupation
- ❖ Agriculture and food production

MNA

- ❖ Anthropometric measurement(Height, Weight, MUAC)
- ❖ Dietary assessment(numbers of meals, food and fluid intake, nutritional supplementations)

  Lifestyle
    - ❖ Smoking status
    - ❖ Alcohol consumption

Dependent variable

Nutritional status of pregnant women and lactating mothers

1.7. Conceptual framework

Independent variables

Demographic status

- ❖ Age
- ❖ Ethnicity
- ❖ Pregnant women
- ❖ Lactating mothers(baby up to 6 months of breast feeding)
- ❖ Education
- ❖ Income
- ❖ Occupation
- ❖ Agriculture and food production

MNA

- ❖ Anthropometric measurement(Height, Weight, MUAC)
- ❖ Dietary assessment(numbers of meals, food and fluid intake, nutritional supplementations)
  Lifestyle
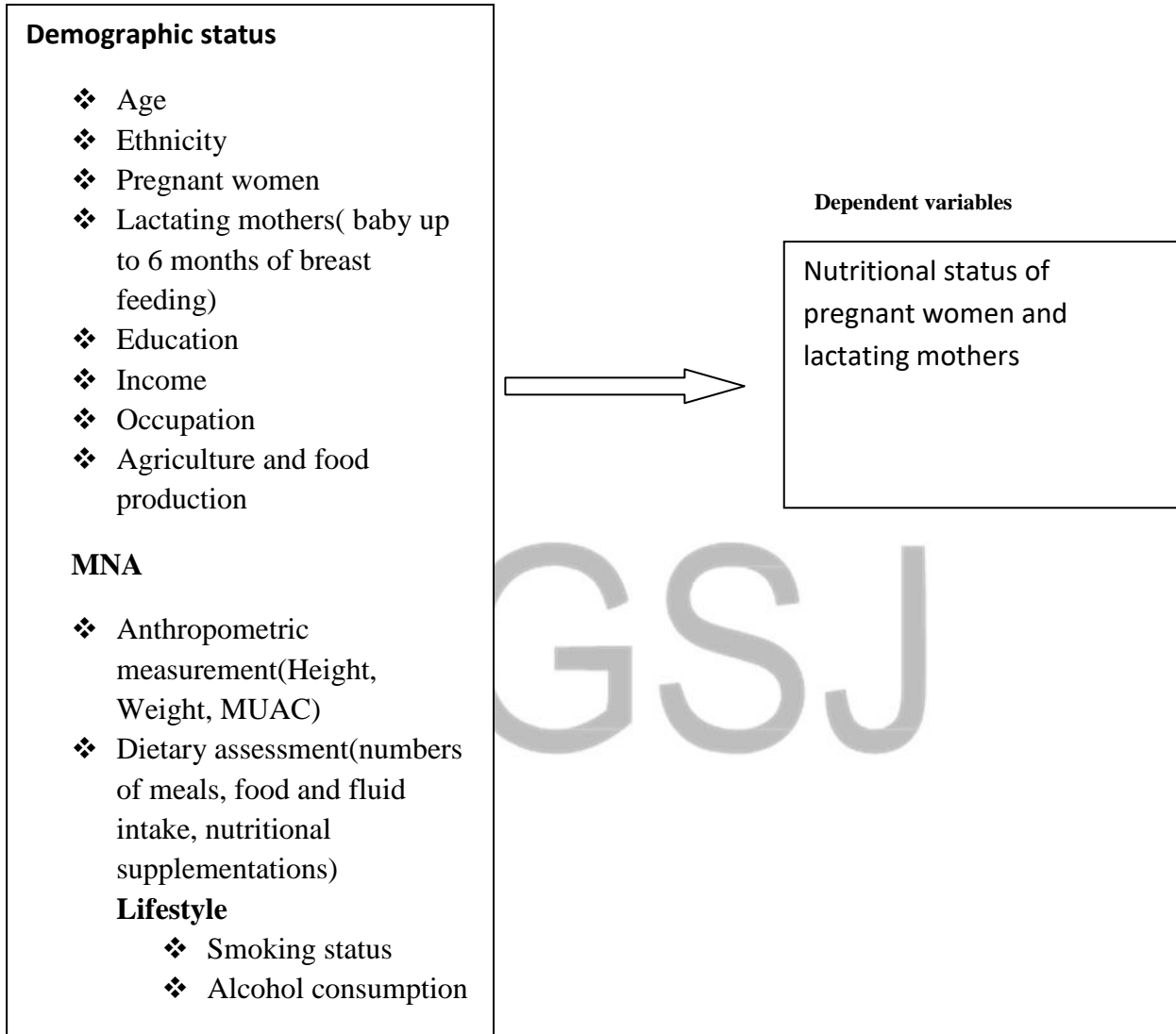 - ❖ Smoking status
  - ❖ Alcohol consumption

Dependent variables

Nutritional status of pregnant women and lactating mothers

Chapter II

2. Literature review

Various literatures are searched regarding to the nutritional status of pregnant and lactating women. I had taken various of sources as pub med, scholargoogle.com ,and various medical journals including the online and offline article .

The research done by the <u>Neha Kajale</u>, <u>Anuradha Khadilkar</u>, <u>Shashi Chiplonkar</u> in (November 25th 2014)Methods A random sample of 125 Indian urban lactating mothers (28.9 ± 3.2 yr) was assessed within 6 months postpartum for anthropometry, diet by 24-h recall on three random days, along with socio-economic factors, lactation history and infant's birth weight and current weight. Results and Conclusion Among 18 different TFS, 50% TFS were rich in calcium, 33% rich in iron, 38% in zinc, and only 13% were good sources of vitamins. Mothers taking TFS (n=75) had significantly higher fat intakes than mothers having No Traditional food Supplements (NTS) (n=50). A higher weight gain was seen in TFS mothers (10.5%) than the NTS mothers (8.8%) after adjusting for number of days after delivery, parity, mother's age & breast feeding practices (P<0.05). Percent weight gain in infants of TFS mothers (120.7± 7.3%) was higher than the infants of NTS mothers (96.2±7.8%) (P =0.024) after adjusting for infant's age and breast feeding practices.

(Kajle, Khadikar, & Chaipolanakar, 2014)

The research was done by Noha Morsy, Sakina Alhady. This was published in International Journal of science and Technology research volume 3, Issue 7, July 2014. This study is a survey-based descriptive study conducted among 400 pregnant women to determine the prevalence of anemia and the influence of some factors associated with anemia during pregnancy such as age, socio-economic status, nutrition, awareness, child spacing and spouse's level of education. The concentration of hemoglobin is collected from analytical data and the personal, nutrition and socio-economical information was recorded using questionnaire interview. The investigation indicated that the prevalence of anemia was 91.25% among the interviewed women with 27.5% of mildly anemic (11.0-9.0g/dl), 28.5% moderately anemic (9.0-7.0g/dl), 32% severely anemic (7.0-4.0g/dl) and 3.25% very severely anemic (<4.0g/dl). (Morsy & Alhady, 2014)

The study conducted by the Mulugeta and Meron (2013) found that Majority (71.2%) of the participants did not take additional meals during lactation. The median dietary diversity score of the study participants was 5 out of 14 food groups. The prevalence of underweight, chronic energy deficiency and stunting were 31%, 25% and 2.2% respectively. Using logistic regression model, factors significantly associated with the nutritional status of the study participants (as determined by BMI and MUAC) were size of farm land, length of years of marriage, maize cultivation, frequency of antenatal care visit and age of breastfeeding child (Mulugeta2 & Meron, 2013)

The study was done by the Ethiopia University student on the age group age 15-49 by visiting Nekemte Hospital and Health Centers for family planning and postnatal care during the study period. This study revealed that majority of the women 260(81.3%) was in the age range of 17-25 yrs and attending school 292 (91.3%). The prevalence of underweight, normal, overweight

and Obesity were 65(20%), 240(75%), 20(4.7%) and (0.3%), respectively. From multiple logistic regression analysis family size (AOR=4.604, 95%CI=1.903-11.140 and family income (AOR=0.250, 95%CI=0.100-0.623) were significantly associated with the nutritional status of the study participants

(Hundera, Gemede, Wirtu, & Kenie, 2015)

Nepal Demographic and Health Survey (DHS) 2011 with collaboration with UASID and Food and Nutrition Technical Assistance III Project (FANTA) FHI 360 has shown that typical of other South Asian countries, early marriage and childbearing is not uncommon (more than a third of women begin childbearing by 19 years of age). Anemia affects 35% of all women (close to 48% of pregnant women), only decreasing one percentages point between 2006 and 2011; however, Nepal demonstrated a huge reduction in anemia prevalence among women between 2001 and 2006 (from 68% to 36% of all women). Hookworm infestation may be a particular driver of iron deficiency and anemia in Nepal, particularly in the Terai, where one study found that 75% of pregnant women had hookworms, 73% were anemic, and 88% of anemia cases were due to iron deficiency (Dreyfuss et al. 2000). Although, in the same study 54% had vitamin A deficiency and 20% also had malarial parasites, both of which can also contribute to anemia. As a result of high maternal malnutrition levels, 12% of children are born with low birth weight.

(Nepal Demographic and Health Survey (NDHS) 2011, 2011)

The survey conducted in Japan for the nutritional status of pregnant and lactating has shown. There were fewer smokers, drinkers, and exercisers in pregnant women compared to their controls (P < 0.01). Both pregnant and lactating women showed significantly higher intakes of carbohydrates, calcium and vitamin B2. Mean iron intakes ranged 10.3-11.5 mg in the four groups, all being lower than the recommended intake level for non-pregnant/non-lactating women (12mg/day). Pregnant women consumed more fruits, milk and milk products, and less alcohol beverages and fish/shellfish compared to controls. Lactating women consumed more grain, vegetables, milk and milk products, and less alcohol beverages. There were 22.9% anemic subjects (Hb < 11 g/dL) in pregnant women, and 11.1% anemic subjects (Hb < 12g/dL) in lactating women and 15.7% in non-pregnant/non-lactating women. None of the pregnant subjects was severely anemic (Hb < 8 g/dL). No significant differences were observed in iron intakes between anemic and non-anemic women in each group. (Takimoto & Gynaecol, 2003)

The study was conducted by Haileslassie, Mulugeta and Girma in 2012. Feeding practices, nutritional status and associated factors of lactating women in Samre Woreda, South Eastern Zone of Tigray, Ethiopia has done study. The study was conducted in 2 rural and 2 urban kebeles (Kebele is the lowest administrative unit in Ethiopia consisting of about 1200 households) of Samre Woreda from March-April, 2011. The study area has a total population of 137,423 of

which 70,086 (51%) were male, and 67,337 (49%) were female. Among these, 5222 (3.8%) were lactating mothers [11]. The study area is characterized by household food insecurity [11]. The total number of kebeles and schools were 23 and 48, respectively. The mean height (±SD), weight (±SD), MUAC (±SD) and BMI (±SD) of the study participants were 156.0 cm (±5.4), 48.3 kg (±5.7), 23.2 cm (±1.9) and 19.8 kg/m (±2.0), respectively. One hundred (25%) of the study participants had a BMI less than 18.5 kg/m (chronically energy deficient); whereas only 7 study participants had a BMI greater than or equal to 25 kg/m (over weight). Study subjects with a height of less than or equal to 145 cm (stunted) and with a weight of less than or equal to 45 kg (underweight) were 9 (2.2%) and 124 (31%), respectively. Frequency of ANC visit had a significant association with the nutritional status (BMI) of the lactating mothers, i.e., women who had ANC visits of less than or equal to 3 times were 2.9 times more likely to be malnourished (BMI < 18.5 kg/m) than those who had more than 3 ANC visits [AOR=2.9, (1.2, 7)]. Similarly, women who had children aged greater than 12 months were 2.8 times more likely to be malnourished (BMI < 18.5 kg/m) than those who had children aged less than or equal to 12 months [AOR=2.8, (1.4, 5.8)].

(Haileslassie, Kiday; Mulugeta, Afework; Girma, Meron, 2012)

The study conducted on Assessment of Knowledge of Pregnant Mothers on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia in 2013. The quantitative data were analyzed using SPSS for windows version (16.0). Multiple logistic regression was run to assess factors that were associated with the dependent variable at $p<0.05$ and to control the confounders. This research showed only 64.4% of women had nutrition knowledge during pregnancy. There was a positive significant relation between information about nutrition, educational status of mothers and family income and nutrition knowledge of mothers during pregnancy ($p<0.001$). The knowledge of pregnant mothers was relatively low in this study. Information about nutrition, family income and educational status of mothers had a positive significant relation with mothers' nutrition knowledge in the study area. Hence, the government in collaboration with concerned bodies should focus on nutritional education and information about nutrition to increase the knowledge of pregnant mothers on nutrition and put in practice during pregnancy in the study area.

(Daba, Beyene, Fekadu, & Garoma, 2013)

The study conducted by the Gul Kiziltan, PhD, Efsun Karabudak, PhD, Gorkem Tuncay, MD, PhD, Filiz Avsar showed that Compared to the control group, weight gain and energy intake ($p<0.05$ for second and third trimesters) was less in the fasting group. The percentages of protein ($p<0.05$ for first and second trimesters) and carbohydrates ($p<0.05$ for all trimesters) from total energy was higher in the fasting group than in the control group. We noticed a slight increase in the fasting blood glucose, serum total cholesterol high-density lipoprotein-cholesterol and triglycerides ($p<0.05$ for first trimester) concentrations in the fasting group during Ramadan. However, we found decreased levels in the plasma urea, total cholesterol, triglycerides, low-density lipoprotein-cholesterol and total protein and albumin levels of the fasting group in comparison with the control group. Dietary mineral and vitamin intakes were lower than the

recommended daily allowance, except vitamin Aand vitamin C in both groups. (Kiziltan, Efsun, & al., 2008)

Studies carried out during the last decade have led to a better understanding of the value of anthropometric indicators of nutritional status. The present report concentrates on data concerning 0-5-year-old children and examines the indices of weight and height and the biological significance of "wasting" and "stunting". The need for a reference population as well as for a standard or target is recognized and the advantages and disadvantages of local versus international reference populations are discussed. In the analysis of data, preference is given to the use of standard deviation (SD) scores and to the presentation of whole distributions. Cut-offs, for example - 2SD, are needed for comparison of prevalence's and for screening of populations. Sequential or serial measurements and the increasing use of growth velocities are discussed and their uses and difficulties are outlined. (Gropus, 2012)

The study conducted by Kathleen L. Caldwell,Yi Pan,Mary E. Mortensen et al,shows that NHANES median UI concentration in 2009–2010 (144 lg/L) was significantly lower than in 2007–2008 (164 lg/L). Non-Hispanic blacks had the lowest UI concentrations (131 lg/L) compared with non-Hispanic whites or Hispanics (147 and 148 lg/L, respectively). The median for all pregnant women in NHANES 2005–2010 was less than adequate (129 lg/L), while third trimester women had UI concentrations that were adequate(median UI 172 lg/L). Third trimester women participating in the NCS similarly had an adequate level of iodine intake, with a median UI concentration of 167 lg/L. Furthermore, NCS median UI concentrations varied by geographic location. (Kathleen, Pan, & al., 2010)

The study conducted by Kamla-Raj 2006Pregnant women have been widely recognized as a vulnerable group from health point of view. They need more food than normal person for the proper nourishment of the growing fetus. The field of nutrition of the pregnant women, particularly in rural area, has been sadly neglected. Against this backdrop, the study was carried out among 105 pregnant women from 20 different villages of Balasore district. A pre-tested structured interview schedule was used for the collection of general information. 24 hour recall method of diet survey was applied for the collection of dietary information. Hemoglobin level was collected from doctor's report for observing the anaemic condition. It was found that the mean iron, calcium, carotene and folic acid was much lower than the RDA volumes. Percent incidence of common nutritional deficiencies among the pregnant women was much higher in the third trimester than the 1st and 2nd trimester. In spite of better education and high-income, nutrition intake was lower than RDA in case of many sample women. Based upon the analysis, the study finally emphasizes the need for popularizing cultivationof low cost nutrition greens and vegetables in each household and imparting nutrition education to the village women. (Raj, 2006)

The study conducted by Bhandari,Thapa and et.al in 2015 shows that altogether 21,111 women were interviewed. More than a quarter of the women in Terai were malnourished as indicated by low body mass index (BMI $<$ 18.5 Kg/m^2). Among the dietary intake pattern, the majority of women consumed cereals at least once a day in all three ecological regions. The majority of women in Mountain consumed pulses/legumes thrice a week. In Terai, the majority of women consumed vegetables thrice a week. In all three ecological regions, the majority of women consumed meat and meat products and fruits once a week. About thirty percent of women consumed milk and milk products once a day in all three ecological regions. The non-use of iodized salt by Terai women was the highest (5.3 %, n $=$ 303). In all the ecological regions, cereals and vegetables were produced in the majority of the participants' households in comparison of fruits, poultry and goat/sheep. The women of age 15 to 24 years were 2.7 times more likely to be malnourished than women of 35 to 49 years age (aOR $=$ 2.7, CI $=$ 2.5,3.0). The unemployed women had nearly two times more chances of being malnourished than women doing manual work (aOR $=$ 1.9, 95 % CI $=$ 1.5,2.2). In Terai, women were five times more likely to be malnourished (aOR $=$ 0.2, CI $=$ 0.1,0.2) and 20 times more likely to be anemic (aOR $=$ 0.05, CI $=$ 0.04,0.07) than women in Mountain. The pregnant women were five times more likely to be anemic than non-pregnant women (aOR $=$ 0.2, CI $=$ 0.2,0.3). (Bahndari, Thapa, & al., 2015)

Four hundred lactating mothers were recruited from 400 randomly selected households. Data on socio-demographic characteristics, maternal characteristics, feeding practices, frequency of foods eaten and dietary diversity was collected using a pre-tested and structured questionnaire. Anthropometric measurements were taken from each mother using calibrated equipments and standardized techniques. A one-day weighed food record was also collected from randomly selected sub sample (n=60) of mothers. The nutrient and energy content of foods consumed by the mothers was calculated by using ESHA Food Processor and the Ethiopian Food Composition Tables. To investigate the socio-economic and demographic factors affecting the nutritional status of the women, logistic regression was used. ANOVA and t-test were also used to see if there was a mean difference in nutritional status among the lactating mothers. (Haileslassie & al., 2012)

The first is that maternal micronutrient status in the periconceptional period, and throughout pregnancy and lactation, should be viewed as a continuum; too often these 3 stages are treated and discussed separately from both a scientific and a public health perspective. Iron and vitamin B-12 are included as examples to stress how status at conception affects maternal, fetal, and infant status and health until the child is weaned. The second issue is that while most attention has been focused on a few micronutrients, for example iron and folate as discussed elsewhere in this Supplement, multiple micronutrient deficiencies occur simultaneously when diets are poor. Some of these deserve more attention as causes of poor pregnancy outcome, including other B vitamin deficiencies that result in homo cysteinemia, antioxidants, vitamin D, and iodine. In lactation, maternal status or intake of the B vitamins (except folate), vitamin A, selenium and iodine strongly affect the amount of these nutrients secreted in breast milk. This can result in the infant consuming substantially less than the recommended amounts and further depleting stores that were low at birth. While the optimal mode of meeting recommended micronutrient intakes is an adequate diet, in some situations supplementation is also important. Unfortunately, information is lacking on the optimal formulation of micronutrient supplements for pregnant

women, and the need to continue these supplements during lactation is not recognized in many situations where maternal and infant health could benefit. (Allen, 2015)

A cross-sectional study was conducted to determine nutritional status of pregnant women in different areas of Bangladesh by anthropometric and biochemical assessment. Measurement of body weight gain in different stages of pregnancy period was calculated as 20% and 14% severely malnourished, 54% and 30% moderately malnourished, 21% and 43% well nourished and 5% and 13% over malnourished ; hemoglobin (Hb) level was 16% and 19% severely anemic, 38% and 54% moderately anemic, 24% and 42% mildly anemic and 6% and 11% non-anemic; educational levels were 8% and 15% illiterate, 17% and 44% primary, 29% and 25% secondary, 10% and 39% under graduate and 2% and 11% post graduation of rural and urban pregnant women respectively. Monthly expenditure ≤ Tk.3000 to Tk.4000 food for rural and urban pregnant women were found and considered as important causes for nutritional status during pregnancy period. Beside these, early marriage, frequent birth, illiteracy, poverty, misconceptions, and lack of nutritional knowledge were follow up in this study period. The outcome showed that urban pregnant women were well nourished than rural pregnant women comparatively and also obesity was encountered as an indicator in urban pregnant women than rural. (Hossain B1, 2013)

According to the Himalayan Times Undernutrition has been a longstanding problem in Nepal. The key indicators of child undernutrition such as stunted growth and wasting currently stand at 37.5 per cent and 11.3 per cent respectively at the national level. The most recent pre-earthquake data collated from the 2014 Multiple Indicator Cluster Survey (MICS) and the 2014 Small Area Estimation (SAE) indicates a high rate of child undernutrition in the affected districts. Infant and Young Child Feeding (IYCF) practices were also found to be sub-optimal in those districts. Recovery activities have been proposed to address the immediate as well as longer term needs of the people affected by the earthquakes. Supplementary food assistance and Multiple Micronutrient Powder (MNP) supplementation to the vulnerable groups has been planned for the initial year. (Times, 2016)

Following a random selection of geographical clusters, we collected blood samples from 500 non-pregnant women and 24-h dietary recalls and food frequency questionnaires from a subsample of 379 women. Twenty percent of the women did not consume any food containing cobalamin during the days recalled, and in 72% nutritional cobalamin intake was <1 _g/day. Eighty-four percent of the women had cobalamin intake lower than the estimated average requirement (EAR) (<2 _g/day). In contrast, only 12% of the women had a folate intake less than 100 _g per day, whereas 62% had intake between 100 and 320 _g. Low plasma cobalamin (<150 pmol/L) was found in 42% of the women, most of whom (88%) also had elevated levels of methylmalonic acid. Our results indicated a high prevalence of nutritional cobalamin deficiency, while folate deficiency was uncommon. (chyondo, ulka, & al., 2015)

The prevalence of night blindness during pregnancy and lactation was assessed in a sample of 426 women living in the rural terai of Nepal. These women were also examined for ocular signs or vitamin A deficiency. Among 241 lactating women, 16.2% reported experiencing night blindness at some time during the pregnancy that produced the infant they were now breast-feeding. Among 185 pregnant women, 8.1% reported being night-blind at the time of the interview. The odds of night blindness in the current pregnancy were six times greater for women who reported night blindness in their previous pregnancy. Night-blind women were more likely to come from households with lower socioeconomic status. Teenage women and those over the age of 30 were at highest risk, particularly those of higher parity within these age groups. Vitamin A deficiency, for which night blindness is a marker, seems to be a problem in this population of pregnant and lactating women, with potential health consequences for women and their infants. (J. Katz & al, 2014)

Chapter III

3. Methodology

Research Method

Quantitative research methodology was used

Research design
The study design was Cross sectional descriptive study design

Study area
The study area was Jhalari Pipaladi municipality of Kanchanpur district which is situated in Far-western part of Nepal.

Study population
Pregnant women and lactating women age group between 15-49 of the Jhalari Pipaladi Municipality of the Kanchanpur district

Sample size
The sample size was 227 because the prevalence of the underweight of women was taken. The prevalence rate was 18%.

$$n = (Z^2 \times p \times q) \div e^2$$

$$= (1.96^2 \times 0.18 \times 0.0.82)/0.05^2$$

$$= 226.80 \sim 227$$

Sample technique

The sampling technique was non probability purposive sampling (snow ball sampling).

Data collection procedure

Direct visit to home of respondent and who visited Health centers and semi structured questionnaire. The data were collected by direct visiting the respondent home by asking the people near that place.

Data analysis procedure

The data was entered in to the epi-data and analyzed through the SPSS 16 and on MS Excel

Study population

Women were at the age group of 15-49 and who were pregnant and on the lactating phase.

Study duration

The study duration was four months starting from September to December 2016 including the data collection and analyzing the findings.

Data collection tools

The data were collected using the interview methods and anthropometric measurements. Semi-structured questionnaire was developed which consisted of the questions regarding the study variables such as socio-demographic characteristics, lifestyle and physical health condition. The MNA was used for the physical body measurements of the respondent, in which BMI and MUAC was find out.

Data collection techniques

Date were collected through the face to face interview and physical body assessment was done by taking height and weight of respondent for BMI and Mid Upper Arm circumference by Shakers tape(MUAC tape)

Criteria for sample selection

Inclusion criteria

- Those pregnant and lactating women who were in the Jhalari Pipaladi Municipality of Kanchanpur District of Nepal
- Those who were willing to participate

Exclusion criteria

- Pregnant and lactating women who were unwilling to participate
- The reproductive age group females who were not pregnant and neither in the lactating phase

Validity and reliability

There are various methods of maintaining the Validity and reliability. In this study validity and reliability will be maintain through:

- ❖ Consultation with the subject guide.
- ❖ Other concerned persons will be requested to read the questions and give feedback
- ❖ Tools will be modified as needed according to the remark given by experts
- ❖ The ethical consideration and prescribed guideline given by the research committee should be followed, and if necessary it can be modified
- ❖ Review of the literature should be properly done

The reliability was maintained by following:

- ❖ Pretesting was done to assess the reliability of the tools at least 10% of the sample.
- ❖ True answer cannot be obtained so , questions was probed
- ❖ Privacy and confidentiality was maintained.

Ethical consideration

In order to make the research successful researcher will follow the certain norms and values, which are discussed below.

- ❖ Explain about the purpose and objectives of the our study to the respondents
- ❖ Take a verbal consent of the respondents
- ❖ Not to force anybody to the participate in the study, right to refuse after making them know about the objectives of the study
- ❖ Use polite words and sentences
- ❖ Respect their thoughts
- ❖ Assure them the privacy if they want
- ❖ Provide suggestion on the basic of the result obtained if they desired

Chapter V

4. Findings

This chapter presents the findings related to the Nutritional Status of Pregnant women and lactating mothers of Jhalari Pipaladi Municipality of Kanchanpur district. According to the records of health post 650 were pregnant and lactating women and mothers. The Sample of 227 was taken for the research. The findings of the study are as follows:

The findings of the study are as follows:

4.1. Socio-demographic chacteristics of the respondents
Table 1: socio-demographic status

Variables	Frequencies	Percentage
Ethnicity		
Brahmin	77	33.9
Chhetri	58	25.6
Tharu	57	25.1
Dalit	35	15.4
Total	227	100
Category		
Pregnant women	97	42.7
Lactating mothers	130	57.4
Total	227	100
Age group		
15- 20	29	12.8
21 - 25	82	36.1
26 - 30	63	27.8
31 - 35	39	17.2
36 - 40	11	4.8
40- 49	3	1.3
Total	227	100
Income per months		

2000-5000	59	26
5000-10000	78	34.4
10000-20000	59	26
Above 20000	31	13.7
Total	227	100
Occupation		
Agriculture	116	51.1
Other than agriculture	111	48.9
Total	227	100
Available of own land		
Yes	219	96.5
No	1	0.4
Mutually	7	3.1
	227	100

The table above shows the distribution of respondents according to the Socio-demographic chacteristics. Brahmins were 33.9 percentages, Chhetris were 25.6 percentages, Tharus were 25.1 percentages and Dalits were 15.4 percentages. 97 percentages were pregnant women and 117 were lactating mothers. In the age groups 12.8 percentages were above 20 years age, 36.1 percentages were above 21 and above 25, 27.8 percentages were above 26 and above 30, 17.2percentages were above 31 and above 35, 4.8percentages were above 36 and above 40 and 1.3 were above 40 years of old. In the context of income 26 percentages were having income 5000/month, 34.4 percentages were having income 10000/month, 26 percentages were having income 20000/month, 13.7 percentages were having income 13.7/month. 51.1 were involving in the agriculture and 48.9 were involved in non-agriculture. In the context of having land of

agriculture 96.5 percentages were having land, 0.4 percentages were not having the land and 3.1 were involving mutually(*Adhiya).*

4.2. Life style pattern
Table 2: life style

Lifestyle **Smoking habits**	Frequencies	Percentages
Yes	5	2.2
No	221	97.4
Sometimes	1	0.4
Total	227	100
Alcohol consumption		
Yes	6	2.6
No	215	94.7
Sometimes	6	2.6
Total	227	100

The table above describes about the life style patterns of the pregnant and lactating women of the Jhalari Pipaladi Municipality. 2.2 percentages were having the smoking habits, 97.4 percentages were non smoker and 0.4 percentages were sometimes smokers. 2.6 percentages were alcohol consumers, 94.7 were non alcohol consumers and 2.6 were sometimes consumers.

4.3. Nutritional knowledge
Table 3: familiar with nutritious food

	Frequency	Percent
Yes	207	91.18
No	20	8.82
Total	227	100

The table above shows the nutritional knowledge of the respondents. 91.18 percentages had heard about the nutritional food and 8.82 percentages didn't have heard about it.

Table 4: familiar with carbohydrate, protein, fats and minerals

Variables	frequency	Percent
Yes	206	90.74
No	21	9.26
Total	227	100

The table above shows the heard of the carbohydrate, protein, fats and minerals of the respondents. It has seen that 90.74 had heard about the carbohydrate, protein, fats and minerals whereas 9.26 didn't had heard of it.

Table 5: pattern of daily food consumption

	Frequency	Percent
two times a day	57	25.11
three times a day	93	40.96
four times a day	61	26.87
more than four times a day	16	7.05
Total	227	100

The table above shows the how many times did they food consumed daily. It can be seen that 25.11 percentages respondent consumes food two times a day, 40.96 percentages respondent

consumes three times a day, 26.87 percentages consumes three times a day and 7.05 percentages consumes more than four times a day.

Table 6: eggs and meat consumption

	Frequency	Percent
Yes	215	94.72
No	12	5.28
Total	227	100

The table above shows the meat and egg eggs consumption status. It can be seen that 94.72 percentages consumes fish and meat whereas 5.28 percentages didn't consume meat and eggs.

Table 7: frequency of eggs and meat consumption

	Frequency	Percent
Once a week	32	14.097
twice a week	38	16.74
Daily	7	3.08
when available	138	60.79
Never	12	5.28
Total	227	100

The table above shows the time period of meat and eggs consumption. From the table we can say that 14.097 percentages consumes once a week, 16.74 percentages consume twice a week,3.08 percentages consumes daily, 60.78 percentages consumes when available and 5.28 percentages ne

Table 8:green leafy vegetable consumption patterns

	frequencies	percentage
once a week	45	19.8
twice a week	21	9.3
Daily	21	9.3
when available	140	61.7

Total	227	100.0

The table above shows the time period of the green vegetable consumed by the respondents. It can be seen that 19.8 percentages consumes once a week, 9.3 percentages consumes twice a week, 9.3 percentages consumes daily and 61.7 percentages consumes when available.

Table 9: having land for agriculture

	Frequency	Percent
Yes	219	96.5
No	1	0.4
mutually (Adhiya)	7	3.1
Total	227	100.0

The above table shows the respondent having their own land for cultivation or not. 96.48 percentages respondents says that they are having land for cultivation, 0.44 percentages says no and remaining 3.08 percentages didn't have their own land but works on land as mutually(Adhiya).

Table 10: cultivated food enough for family

Yes	220	96.91
No	2	0.89
some times	5	2.20
Total	227	100

The above table show that is cultivated food enough for family. 96.91 percentages says yes, 0.89 percentages says no and remaining 2.20 says sometimes.

Table 11: amount of fluid intake daily

	frequency	percentages
More than 4 glass	177	77.97
Varies according to the variables	50	22.03

Total	227	100.00

The table above shows the amount of fluid consumed by the respondents. We can see that 77.97 percentages says they intake more than 4 cups per day and 22.03 percentages says it varies according to the sessions.

Table 12: familiar with malnutrition

	Frequency	Percent
Yes	213	93.83
No	14	6.17
Total	227	100

The table above shows the knowledge of the malnutrition on respondents. According to the table 93.83 percentages says they heard about malnutrition and 6.17 percentages didn't.

Table 13: knowledge about preventive measures of malnutrition

	Frequency	Percent
Yes	203	89.42
No	24	10.58
Total	227	100

The table above shows the preventive measures of malnutrition on the respondents. 89.42 percentages says they know the preventive measure of malnutrition and 10.58 percentages says they are unknown about it.

Table 14: preventive measures of malnutrition

	Frequency	Percent
eating nutritional food	174	76.65
medicine intake	17	7.48
check up regularly	11	4.84
all of the above	23	10.13
Don't know	2	0.90
Total	227	100

The above table shows the preventive measures of malnutrition known by people. 76.65 percentages says it can be prevented by eating nutritional food, 7.48 percentages says my medicine intake, 4.84 percentages says check up regularly, 10.13 percentages says all of these methods (eating, medication and health check up) and 0.90 percentages says they don't know.

Table 15: health care visitors

	Frequency	Percent
Yes	215	94.7
No	12	5.3
Total	227	100.0

The table shows the respondent visiting the health center regularly. 94.71percentages says yes they visit and 5.29 percentages says no they don't visit the health center regularly.

4.4. Mini Nutritional Assessment (MNA)
Table 16: Mini Nutritional Assessment

MUAC	Frequencies	Percentages
Normal	80	35.2
At risk	63	27.8
Obese	18	7.9
Under		

nutrition	66	29.1
Total	227	100
BMI		
Normal	77	33.9
Under nutrition	107	47.1
	30	13.2
At risk		
	13	5.7
Over weight		
Total	227	100

The above table shows the anthropometric measurement on the respondents. The mini nutritional assessment was taken in which the BMI (Body Mass Index) and MUAC (Mid Upper Arm Circumference) was measured. According to the BMI 33.9 percentages were normal, 47.1 percentages were under nutrition, 13.2 percentages were at risk and 5.7 percentages were overweight. According to the MUAC 35.2 percentages were normal, 27.8 percentages were at risk, 7.9 percentages were obese and 29.1 percentages were under nutrition.

Nutritional knowledge
Table 17: nutritional knowledge

Scores	Frequencies	Percentages
0-4	2	0.9
5-8	66	29
9-12	159	70.1
Total	227	100

The table above shows the nutritional knowledge level of the respondent. According to the table 0.9 percentages lies in the 0-4 category, 29 percentages lies in the 5-8 category and 70.1 percentages lies in the 9-12 categories.

Scores ranges	Level of knowledge
0-4	Poor
5-8	Good
8-12	Very good

The table above shows the category of level of knowledge. 0-4 scores lies in the poor rank, 5-8 scores lies in good rank and 8-12 lies in the very good rank. As per as the finding 0.9 percentages respondent have poor level of knowledge, 29 percent of the respondent have good level of knowledge and 70.1 percentages have very good level of knowledge.

4.5. Association factor related with the nutrition

The associated factors are given below and are compared with the nutritional status which is measured by MUAC:

Table 18: Association between age and MUAC

category	Normal	At risk	Obese	Under nutrition	Chi-square	p-value	d.f
Less than 20 years	9 (4%)	14 (6.2%)	2 (0.9%)	4(1.8%)	24.76	0.053	3
Above 20 years	72(31.2%)	49(21.6%)	16 (7%)	62(27.3%)			

The table shows the association between the age and MUAC. It shows that among the age group below 20yaers 4% were normal, 6.2% were at risk, 0.9% was obese and 1.8% were under nutrition. Likewise in above 20 years 31.2% were normal, 21.6% were at risk, 7% were obese and 27.3% were under nutrition. The significant association chi-square value was 0.053.

Table 19: Association between occupation and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	p-value	d.f
Agriculture	23 (10.1%)	17 (7.5%)	2 (0.9%)	17 (7.5%)			
Non agriculture	57 (35.2%)	46(20.3%)	16 (7%)	49(21.6%)	13.162	0.155	2

The table shows the association between the occupation and MUAC. It shows that among agriculture 23% were normal, 7.5% were at risk, 0.9%% were obese and 7.5% were under nutrition. Likewise in non agriculture 35.2% were normal, 20.3% were at risk, 7% were obese and 21.6% were under nutrition. The significant association chi-square value was 0.155.

Table 20: Association between Income and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	p-value	d.f
5000 months	23 (10.1%)	17 (7.5%)	2 (0.9%)	17 (7.5%)			
Above 5000 months	57 (35.2%)	46 (20.3%)	16 (7%)	49 (21.6%)	13.169	0.155	2

The table shows the association between the income and MUAC. It shows that among the income level 5000 per months 10.1% were normal, 7.5% were at risk, 0.9% were obese and 7.5% were under nutrition. Likewise in above 5000 per month 35.2% were normal, 20.3% were at risk, 7% were obese and 21.6% were under nutrition The significant association chi-square value was 0.155.

Table 21: Association between smoking habits and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
Smoking	3 (1.3%)	1 (0.4%)	0	1 (0.4%)			
					13.1693	2	0.040
Non Smoking	77 (33.9%)	61 (26.9%)	17(7.5%)	65(28.7%)			

The table shows the association between smoking habits and MUAC. It shows that among the smokers 1.3% were normal, 0.4% were at risk, 0% were obese and 0.4% were under nutrition. Likewise in non smokers 33.9% were normal, 26.9% were at risk, 7.5% were obese and 28.7% were under nutrition. The significant association chi-square value was 0.040.

Table 22: Association between alcohol consumption and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
Alcohol consumption	1 (0.4%)	4 (1.7%)	2 (0.9%)	2 (0.9%)	9.543	2	0.145
Non alcohol consumption	79 (34.8%)	60 (26.1%)	16(7%)	60 (26.1%)			

The table shows the association between the alcohol consumption and MUAC. It shows that among the alcohol consumers 0.4% were normal, 1.7% were at risk, 0.9% were obese and 0.9% were under nutrition. Likewise in non smokers 34.8% were normal, 26.1% were at risk, 7% were obese and 26.1% were under nutrition. The significant association chi-square value was 0.145.

Table 23: Association between having land for agriculture and nutritional statuss

Category	Normal	At risk	Obese	Under nutrition	Chi-square value	d.f	p-value
Having land	75 (33%)	61(26.9%)	18(7.9%)	65(28.6%)			
Do not having land	1 (0.4%)	0	0	0	3.987	2	0.67

Adhiya(mut ally)	4 (1.8%)	2(0.9%)	0	1 (0.4%)

The table shows the association between the having land for agriculture and MUAC. It shows that among the having the land 33% were normal, 26.9% were at risk, 7.9% were obese and 28.6% were under nutrition. Likewise women do not having land shows that 0.4% were normal, 0% were at risk, 0% were obese and 0% were under nutrition and having no land but work manually shows that A significant association shows that 1.8% were normal, 0.9% were at risk, 0 were obese and o.4% were under nutrition. The significant association chi-square value was 0.067.

Table 24: Association between eating meat and eggs and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
yes	76 (33.5%)	59 (26%)	17 (7.5%)	63 (27.8%)	0.230	3	0.973
No	4 (1.8%)	4 (1.8%)	1 (0.4%)	3(1.3%)			

The table shows the association between the eating meat and eggs and MUAC. It shows that among the meat and eggs consumers 33.5% were normal, 26% were at risk, 7.5% were obese and 27.8% were under nutrition. Likewise in non eggs and meat consumers 1.8% were normal, 1.8% were at risk, 1% were obese and 1.3% were under nutrition. The significant association chi-square value was 0.973.

Table 25: Association between fluid intake and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
More than 4 cups a day	66(29.1%)	48 (21.1%)	16 (7%)	47 (20.7%)			

Varies to season	14 (6.2%)	15(6.6%)	2(0.9%)	19(8.4%)	9.603	3	0.022

The table shows the association between fluid intake patterns and MUAC. It shows that among more four cups fluid consumers 29.1% were normal, 21.1% were at risk, 7% were obese and 20.7% were under nutrition. Likewise in fluid consumers who varies according to the seasons 6.2% were normal, 6.6% were at risk, 0.9% were obese and 8.4% were under nutrition. The significant association chi-square value was 0.022.

Table 26: Association between visitors and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
Yes	33(7.5%)	63 (27.8%)	18 (7.9%)	59(26%)			
					8.400	3	0.038
No	5 (2.2%)	0	0	7(3.1%)			

The table shows the association between the health center visitors regularly and MUAC. It shows that among the health center visitors 7.5% were normal, 27.8% were at risk, 7.9% were obese and 26% were under nutrition. Likewise those who do not visit health center regularly shows 5% were normal, 0% were at risk, 0% were obese and 3.1% were under nutrition The significant association chi-square value was 0.038.

Table 27: Association between daily food intake patterns and nutritional status

Category	Normal	At risk	Obese	Under nutrition	Chi-square	d.f	p-value
Two times a day	16(7%)	19(8.4%)	2 (0.9%)	20 (8.8%)			
More than two times	64(28.2%)	44(19.4%)	16 (7%)	46(20.3%)	155.955	2	0.035

The table shows the association between daily food intakes patterns and MUAC. It shows that among the two times food consumers 7% were normal, 8.4% were at risk, 0.9% were obese and

8.8% were under nutrition. Likewise in more than two times food consumers 28.2% were normal, 19.4% were at risk, 7% were obese and 20.3% were under nutrition. The significant association chi-square value was 0.035.

Chapter V

5. Discussion

Despite the high frequency and the serious consequences of malnutrition, prevention and treatment of malnutrition do not currently receive appropriate attention. Increased awareness of the importance of nutritional screening among the pregnant and lactating women is needed (soderstom, 2013). This study used MNA as the screening tools to identify the nutritional status of pregnant women and lactating mothers of Jhalari Pipaladi Municipality of Kanchanpur District. The study used MNA as the screening tools to identify the nutritional status. Further, it also identified the demographic status, lifestyle, knowledge, physical measurement and various associated factors related to the nutrition.

In the study 12.8 percentages were above 20 years age,36.1 percentages were above 21 and above 25, 27.8 percentages were above 26 and above 30, 17.2percentages were above 31 and above 35, 4.8percentages were above 36 and above 40 and 1.3 were above 40 years of old. In regard to the ethnicity Brahmin were 33.9 percentages, Chhetris were 25.6 percentages, Tharus were 25.1 percentages and Dalits were 15.4 percentages. 97 percentages were pregnant women and 117 were lactating mothers. The main occupation of the respondent was agriculture which was 51.1 percentages.

Regarding to the lifestyle 2.2 percentages were having the smoking habits, 97.4 percentages were non smoker and 0.4 percentages were sometimes smokers. 2.6 percentages were alcohol consumers, 94.7 were non alcohol consumers and 2.6 were sometimes consumers.

The majority of participants, 240(75%), BMI was in the normal range, that is from 18.5-24.9kg/m2. About one-fifth of the respondents, 65(20.5%) have BMI of less than18.5 kg/m2, whereas 15(4.7%) and 5(1.5%) have BMI greater than or equal to 25 kg/m2 respectively (Hundra, Gemede, & et, 2015). The study shows that according to the mini nutritional assessment (MNA) which was taken in which the BMI (Body Mass Index) and MUAC (Mid Upper Arm Circumference) was measured. According to the BMI 33.9 percentages were normal, 47.1 percentages were under nutrition, 13.2 percentages were at risk and 5.7 percentages were overweight. According to the MUAC 35.2 percentages were normal, 27.8 percentages were at risk, 7.9 percentages were obese and 29.1 percentages were under nutrition which was close to the findings of the similar research conducted in Nepal in 2012 by Lyons G., where 43 percentages were malnourished, 17 percentages were at risk.

Many factors appear to contribute to the nutritional conditional evidenced with pregnant and lactating women, smoking, alcohol consumption, lifestyle (sedentary behavior, physical inactivity. Poor diet), hormonal changes, and diseases can contribute to malnourishment (Hundra, Gemede, & et, 2015). The study shows that It shows that among the smokers 1.3% were normal, 0.4% were at risk, 0% were obese and 0.4% were under nutrition. Likewise in non smokers 33.9% were normal, 26.9% were at risk, 7.5% were obese and 28.7% were under nutrition. A significant association shows it is significant associated.

Statically significantly association was observed in smokers, fluid intake health center visitors regularly, and daily food intake patterns. The statically significance association of the smokers shows the significant association with the nutrition (p= 0.040). The fluid intake was significantly associated with the nutrition (P= 0.022). The health care visitors were also significant associated with the nutrition (p= 0.038). The daily food consumption pattern is also associated with nutrition (p=0.035) the same study was conducted in the Ethiopia by Daba and the group in which Significant association with education level, family income, dietary intake, health visit regularly. (Daba, Beyene, Fekadu, & Garoma, 2013)

In context to nutritional education 70.1% were having the good level of knowledge, 29% having good level of knowledge and 0.9% were having the poor level of knowledge. The same study was done by Bhandari, Shiva,et al.(2014) in which 23.6% good knowledge64.4% very good knowledge12% poor knowledge was seen. (Bhandari & shiva, 2014)

Chapter VI

6. Conclusion and recommendations

6.1. Conclusion

The overall prevalence of the malnutrition among the pregnant and lactating mothers of Jhalari Pipaladi municipality was measured by the MUAC and BMI. According to the BMI 33.9 percentages were normal, 47.1 percentages were under nutrition, 13.2 percentages were at risk and 5.7 percentages were overweight. According to the MUAC 35.2 percentages were normal, 27.8 percentages were at risk, 7.9 percentages were obese and 29.1 percentages were under nutrition. Thus it is seen that there is a great risk of malnutrition among the pregnant women and lactating mothers of Jhalari Pipaladi Municipality of Kanchanpur.

Various factors such smoking, alcohol consumption, fluid intake, health care facilities visitors and daily intake food patterns ,eggs and meat consumption patterns, land for agriculture and income level. The significant association was seen between smoking habits and nutrition, daily fluid intake patterns and nutrition, health care facilities users and nutrition and daily food intake patters and nutrition. Most of the people were engaged in the agriculture as the occupation. Most of the people have nutritional related knowledge in Jhalari Pipaladi Municipality.

There seems to be need of regular monitoring of the nutritional status of the pregnant women and lactating mothers of the Jhalari Pipaladi Municipality. The identification of nutritional status and related factors allows interventions directed to the real needs of Pregnant women and lactating mothers, aimed at healthy and quality of life for all.

Almost pregnant and lactating women were having the very good level knowledge which was70.1 percentages, few were having the moderate level of knowledge which was 29 percentages and 0.9 percentages were having the poor level of knowledge in regarding to the nutritional status.

Maximum of the respondent were non vegetarian who consume eggs fish and meat. There was not specific timely period of consuming the eggs, meat and fish. Green leafy vegetables were consumed by almost all of the respondent but they consume it when there is available of it. Almost of the respondent were familiar with the malnutrition and its preventive measures.

6.2. Recommendations

The finding of the present study, address the need for timely screening and regular monitoring of the nutritional status of the Pregnant women and lactating mothers, so that pregnant and lactating women identification of the nutritional status can be commenced and necessary interventions can be taken in time to help the morbidity conditions due to poor nutritional status and improve the health of the Pregnant and lactating women. As per as the finding the following recommendations are given:

- Regular nutritional assessment of pregnant and lactating women should be done
- Food supplements should be given to the pregnant and lactating women
- Community based programme about the nutritional food in regarding to the pregnant and lactating women should be conducted regularly
- By the process of screening the malnourished mothers and pregnant women should be identified and those malnourished should be treated.
- The knowledge that is present on the pregnant and lactating women about the nutrition should be implemented by local levels
- Awareness programme should be conducted on the areas about the nutritional food, health of mothers and child.

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Annex

Informed consent and questionnaire

National Open College

Sanepa, Lalitpur

Nutritional Status of Pregnant women and lactating mothers

Of Jhalari Pipaladi Municipality

Namaste!!

My name is Mahesh Bahadur Mahara. I am a 4th year student of Public Health in national Open College, Sanepa, Lalitpur. I am conducting survey on the Nutritional Status of Pregnant women and lactating mothers of Jhalari Pipaladi Municipality. This study is for the fulfillment of Bachelor Degree in Public Health. This information will help us to plan and improve information made available on the nutritional status and the factor associated among the pregnant women and lactating mothers. During this survey you will be asked questions regarding your health status, lifestyle, diet and one's self view of their health and nutritional status. Certain measurements such as height, weight, Mid Upper Arm Circumference will also be taken. The survey takes 10-15 minutes to complete.

I would very much appreciate your participation in the survey. Whatever information you provide, will be kept strictly confidential and will not be shown to other persons. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate in this survey since your views are important. At this time your views are important. At this time, do you want to ask me anything about the survey?

Thank you!!

I agree to participate in this research.

1. Yes   2. No

Signature of interviewer …………………………..
Date…………………………

Questionnaire on nutritional status of pregnant women and lactating mothers of Jhalari-Pipaladi municipality

Kanchanpur, District of Nepal

Date…………………   Respondent no…………

1.Demographic status:

A.Age……………

B. Ethnicity

Brahmin ☐   chhetri ☐   tharu ☐   dalit ☐   others ☐

C. Category:

a. Pregnant ☐

b.Lactating ☐

D. Educational level

 a. praud education   ☐   b. Primary ☐   c. secondary above 10 ☐

E. Income level

a.50000/month   ☐   b. 10000/month ☐   c. 20000/month ☐   d. above 20000

F. Occupation

a.Agriculture ☐   b. government job ☐   c. foreign ☐   c. others ☐

G. Do you have your own lad for cultivation of foods crops

a. Yes ☐   b. No ☐   c. mutually(Adhiya) ☐

H. Is cultivated food enough for your family

a. Yes ☐   b. No ☐   c. sometimes ☐

2.Life style

A.Do you smoke a cigarette?

a. No ☐   b. Yes ☐   c. some times ☐

B.Do you consume alcohol?

  a.   Yes ☐   b. No ☐   c. sometimes ☐

  3.Nutritional knowledge

A.Did you hear about the nutritional food?

  a.   Yes ☐   b. No ☐

B. Do you know about the carbohydrate, protein, fats, vitamins and minerals?

  a.   Yes ☐   b. No ☐

C. How often do you consume food daily?

a. Two times a day ☐   b. three times a day ☐   c. four times a day ☐
d. more than four times a day ☐

D. Do you consume eggs and meat?

a. Yes ☐   b. No ☐

E. How much of fluid(water, milk, tea, Coffee, yogurt) do you intake daily

a.4 cups daily ☐   b. more than four cups daily ☐   c. varies according to the
sessions ☐

F. How often do you consume eggs and meat?

a. Once a week ☐   b. twice a week ☐   c. daily ☐   d. when available ☐

G. How often do you consume green leafy vegetables?

a. Once a week ☐   b. twice a week ☐   c. daily ☐   d. when available ☐

H. Do you have hear about malnutrition?

a. Yes ☐   b. No ☐

I. Do you know the preventive measures of malnutrition?

a. Yes ☐   b. No ☐

J. What are the preventive measures of malnutrition?

a. Eating food regularly ☐   b. medicine intake ☐   c. check up regularly ☐
d. all of the above ☐

K. Do go to health center for regular check of height weight measurement?

a. Yes ☐   b. No ☐

4.MNA

A.MUAC……………………………

a. normal ☐   b. at risk ☐   c. obese ☐   d. under
nutrition   ☐

B.BMI

Height in meter:

Weight in kg:

C.BMI:

a. Over weight ☐   b. Underweight ☐   c. at risk ☐   d. Normal ☐

Thank you for your valuable time

Annex 2

Work plan

Activities	September				October				November
	1st wk	2nd wk	3rd wk	4th wk	1st wk	2nd wk	3rd wk	4th wk	
Topic selection	■								
Literature review		■							
Proposal writing		■	■						
Primary data collection				■	■	■			
Data entry and analysis						■	■		
Draft report								■	
Final report presentation									■