1. Introduction

1.1 Background:

Health is a multidimensional state; the physiological dimension is most crucial, where every organ and system has to work in perfect harmony and at optimum capacity within the range of the normality. Among the various factors which affect the physiological state of an individual, nutrition plays a vital role and is associated with every aspect of life i.e. immunity, infection, fertility, maternal and child health etc\(^1\).

The nutritional status of children in our country is not satisfactory. Various nutritional problems are prevailing in every segment of our population. Most of the pregnant women, nursing mother and children are suffering from nutritional problems like PEM, Nutritional anemia and Low birth weight.

The total population of Nepal is estimated as 23.2 million in 1996. The crude birth and crude death rate are 39.0 and 12.0 per 1000 population respectively\(^2\). Mother and children constitute major component of our population \(^3\). They are more vulnerable to diseases and are special risk to growth, development and survival during infancy and childhood, and during childbearing age in women.

According to NFHS 1996, The infant and under five mortality rate are estimated as 79 and 118 per 1000 live births respectively in Nepal. About 25% of births were reported as low birth weight in general population. Most of the low birth weight babies suffer from growth retardation and tow third of the low birth weight babies die with in six years of age.\(^4\)

The socioeconomic factors like maternal education, occupation, workload and sanitary condition plays a vital role in the birth weight as well as child growth and development.
Nutritional Status:

About two out of three (63.5%) children are stunted in Nepal. The percent of children <3 years of age who are chronically malnourished (Stunted) and acutely malnourished (Wasted) are 48.4% and 11.2% respectively in Nepal. The low weight for age, which reflects general malnutrition (a combination of both acute and chronic malnutrition) is higher in 6-18 months of age group for which inadequate feeding practice, acute infection, diarrhoea, inadequate/ inappropriate water supply, poor sanitation and socio-economic factors seem to be responsible. One of the key factors responsible for poor nutritional status is a high prevalence of low birth weight babies.

It would be worthwhile to see the present status of weight gain and associated factors during infancy in relation to birth weight, by which the factors associated with poor weight gain, can be identified among the low birth weight infants.

1.2 Study Area:

Chitawan district is selected purposively because of its better infrastructure, proper functioning primary health care system and proximity to Kathmandu. This study will be carried out in Ratnanagar Municipality in Chitawan, a newly established Municipality is also selected purposively. People living in this area are of different ethnic groups and of different socio-economic status. The Municipality is approximately 12 km east from the district head quarter that is why most of the pregnant are expected to go to the hospital to deliver their babies. The chances of getting an adequate sample size (because of large population) as well as the possibility of locating the babies was expected to be high in this area as compared to the Bharatpur Municipality.

1.2.1 Background of Ratnanagar Municipality:

Ratnanagar Municipality is one of the two municipalities of Chitawan district, which was established in 2053 B.S. This municipality has 13 wards. The total population in this municipality is 32,251, with total number of male: 15,910; and female: 16341. The total
number of households in this municipality is 5,541 spread over an area of 185.71 hectares. Most of the land (2911.56 hectares) is used for agriculture purpose (Ratnanagar Nagarpalika -2055-unpublished). The crude birth and death rate is not available. Health service is being provided by one health post (Bakulahar Health Post), one sub-health post (Panchakanya sub-health post) and by various health workers like Health assistant, AHW, TBA, MCHW, FCHV as in every other places of the countries. There are 26 primary schools, 3 lower secondary schools, 8 high schools and one campus. The total literacy rate of this municipality is not known.

1.3 Statement of Problem:

Low birth weight:

Globally, one in six live births or almost 25 million LBW babies were born in 1990, which was 17% of the total births. More than halves of the world’s LBW babies are born in South Asia. Their risk of dying before first birthday is four times higher than that of other infants. Regional data of low birth in Asia, Africa, Latin America and North America was 21, 15, 11 and 7 percent respectively. A recent multicenter study done by WHO in 1994 showed that the mortality pattern of LBW babies in India, Nepal and Sri-Lanka was 67.0, 43.3 and 46.7 percent respectively.

Though the national figure on incidence rate of the low birth weight babies is not available, hospital based study in TUTH and Paropakar Indrarajya Laxmi Devi Maternity Hospital in Kathmandu had reported 20.8% and 17.5% The community-based study done in Chitawan had reported the incidence of Low birth weight (LBW) babies as 14.4%. Weight at birth is considered as the single most important determinant of survival of the newborn. According to a reports of WHO/UNICEF, this had contributed to the estimated 9.1 million infant deaths every year in the world. The incidence of low birth weight babies is more common in developing countries than in developed countries,
which has significantly contributed to the neonatal and post-neonatal mortality in those settings.

**Growth:**

The growth pattern of full term LBW infants is markedly different during the first eight weeks of life. There are 167 million underweight <5 years old children in the world. Among them 90 million children live in South Asia. In developing countries about one third of <5 years children are moderately or severely malnourished. About 80% of total <5 years deaths in developing countries are associated with mild and moderate malnutrition.

The main cause of child malnutrition is mainly due to delayed introduction of semi-solid foods, which has to be introduced after six months in addition to breast milk. Report shows that most children do not receive semi-solid food until 9 months of age to 2nd year of life.

Chronic malnutrition is the result of various factors like incorrect food preparation, deficiency of nutrients, unrecognized infection or infestation. Among these, inadequate feeding practices have a major role, especially with acute infection and diarrhoea, which is compounded by inadequate water, sanitation and other conditions of poverty. About two of three (63.5%) children of 6-36 months of age are stunted in Nepal. The low weight for age, which reflects general malnutrition (a combination of both acute and chronic malnutrition) is higher in 6-18 months age group.

**1.4 Significance of the problem:**

The low birth weight babies are more prone to develop malnutrition and ARI, which increases the risk of dying before the infant in one-year-old four times higher than that of normal birth weight babies. High risk of dying of their child affects the fertility behaviour of the couple resulting in high fertility rate due to insecurity of survival of their children. All these ultimately affect the maternal and child health leading to the vicious
cycle of the low birth weight babies by malnourished mothers, retardation of growth and development and even to death of the future child.

**1.5 Research Questions:**

Research questions of this study are:

- What is the prevalence of LBW among the hospital born infants of Ratnanagar municipality?

- What is the present status of weight gain of the low birth weight infants?

- Is there any variation in weight gain between the low birth weight and normal birth weight infants?

- What factors are associated with weight gain?
1.6 Conceptual Framework:

**Socioeconomic factors**
- Maternal education
- Maternal occupation
- Family size
- Number of sibling
- Sex of child

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**Birth Weight**

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**Weight Gain**

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**Morbidity**

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**Childcare practice**
- Weaning
- Supplementary feeding
- Proportion of time given to child care by mother
1.7. **Objectives:**

1.7.1 **General objectives:**

- To find out the status of gain in weight in relation to Birth weight and associated factors among the infants of Ratnanagar Municipality of Chitawan district.

1.7.2 **Specific objectives:**

- To find out the prevalence of low birth weight among the hospital born babies of Ratnanagar municipality.

- To find out the present status of nutrition (weight for age) of LBW and normal birth weight babies.

- To compare the gain in weight of low birth weight and normal birth weight infants.

- To identify the factors associated with weight gain of low birth weight babies.

1.8 **Variables:**

1.8.1 **Dependent variable:**

- Physical growth (weight for age)

1.8.2 **Independent variables:**

- Birth weight
- Morbidity
- Breast-feeding
- Supplementary feeding practice
- Weaning practice
- Caretaker of child
- Sex of children
- Occupation of mother
- Proportion of time given for child care by mother
1.9 Operational Definitions:

1. **Gain in weight:** Gain in weight is the observed difference in weight of the infants from birth weight, which will be assessed by measuring the weight.

2. **Time of introducing supplementary food:** Time of first introduction of food in addition to mothers’ milk.

3. **Malnourished/ under weight children:** Infants having weight for age (WAZ) Z score <-2 SD than expected (according to WHO standard).

4. **Birth weight:** Weight of the babies immediately after birth which is mentioned in birth certificate of infants or mentioned in birth register of Bharatpur hospital.

5. **Low birth weight:** Birth weight of the babies less than or equal to 2500 grams at the time of birth which is mentioned in birth certificate / birth register.

6. **Normal birth weight:** Birth weight of the babies more than 2500 grams at the time of birth which is mentioned in birth certificate / birth register.

7. **Caretaker of child:** Person who takes care for the children in absence of parents.

8. **Social factors:** Social factors include the family size, number of sibling, sex of child, child care practice, maternal education, occupation, and proportion of time given for childcare.

9. **Hospital/ Health institution:** This includes Primary Health Center, Nursing Homes, and other Government Hospital of Chitawan districts.

10. **Proportion of time:** Total time given in hours by mother for an example for childcare.

11. **Child care practice:** This includes weaning, supplementary feeding, time given to child care by mother.

12. **Pasni:** Pasni is the occasion of celebration when a child is first introduced to supplementary food.

13. **Regularity of feeding:** Continuity of supplementary/ extra food after first introduction.