A STUDY ON NUTRITIONAL STATUS AND RELATED KAP (KNOWLEDGE, ATTITUDE, PRACTICE) OF ADOLESCENT MOTHERS IN A SELECTED AREA OF BANGLADESH

A DISSERTATION FOR THE PARTIAL FULFILMENT OF THE DEGREE OF MASTER OF PHILOSOPHY IN NUTRITION AND FOOD SCIENCE
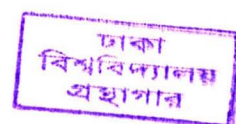
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SESSION: 2011-2012

GIFT

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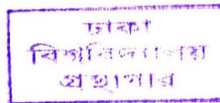## UNIVERSITY OF DHAKA

JULY,2018.

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Citification

This is to certify that the thesis titled "A Study on Nutritional Status and Related KAP (Knowledge, Attitude, Practice) of Adolescent Mothers in a Selected Area of Bangladesh" submitted by Shaila Sabrin, Registration No – 196, Session 2011-12 enrolled in University of Dhaka, Bangladesh, for the partial fulfillment of the degree of Master of Philosophy from Institute of Nutrition and food Science, was supervised by me.

This thesis can certainly be submitted to the Examination Committee for evaluation.

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Dedicated

To

My Beloved Parents and Husband

ACKNOWLEDGEMENT

ABSTRACT

Title: A Study on Nutritional Status and Related KAP (Knowledge, Attitude, Practice) of Adolescent Mothers in a Selected Area of Bangladesh

Background: According to UNICEF (2012) in Bangladesh about 20.9% of the total population consists of children between 10 to 19 years of age who is defined as adolescent. Adolescent period is considered as an active period of growth and development because in this age period adolescent go through physical, mental, emotional & social changes. [*] Nutrition is a fundamental pillar of human life, health and development throughout the entire life span. Adolescence is a significant period of human growth and maturation. In Bangladesh adolescent population is about 24% and highest prevalence of nutritional deficiencies occur during adolescence. The young mother's nutritional status is very important. According to reports of BDHS 2014, nearly 1/3 girls of age between 15-19 years have begun childbearing and the percentage is 31%. In our country adolescent mothers are more likely to suffer from nutritional deficiencies than others, for reasons including women's reproductive biology, low social status, poverty, and lack of proper nutritional knowledge and practice.

Objectives: This cross-sectional study was carried out to investigate the nutritional status and nutrition related KAP (Knowledge, Attitude and Practice) of adolescent mothers in a selected rural area of Bangladesh. This KAP survey gathers information about what adolescent mothers know about their nutritional status, and what they actually do with regard to seeking care or taking other action.

Methodology: A cross sectional study was conducted at KushtiaSadarupozillas between April to October, 2015. A total of 300 adolescent girls aged between 15-19 years mothers were purposively taken as study population. Nutritional status was assessed by anthropometric measurements-height, weight and BMI. A structural questionnaire was conducted to assess nutritional knowledge, attitude and practice. 7 days food frequency method is conducted to assess dietary practice. Data analysis was done by SPSS version 20. ANOVA tests, T test were done to analyze the data.

Result: Total study respondents were divided in two age groups, among which most of the respondents fall under 18-19 year age category which is 70.7%. Within the total sample size, underweight BMI ($\leq 5^{th}$ percentile) is 15.37; normal BMI ($>5^{th}$ to 85th Percentiles) is 15.37 to 20.65; risk of overweight BMI ($>85^{th}$ to 95th Percentiles) is 20.65 to 23.13; and overweight ($>95^{th}$ percentile) is above 23.13. Almost 19.3% respondents had appropriate knowledge about nutrition, 60% respondents had positive attitude about nutrition. About 51.45% mother doesn't take milk 1-3 times in a week. Only 9.90% consumed 6-7 times per week. 93.31% mother doesn't take liver in a week. A good number of mothers don't take egg 1-3 times in a week (38.75%). Only 4.50% consumed 6-7 times per week. 33.41% mothers take meat 1-3 times per week. Fish intake is more frequent than meat. 44.82% mothers take fish 6-7 times per week. 38.3% of the respondents take vegetables 6-7 times per week. 45.43% takes fruits 1-3 times per week.

Conclusion: Adolescence is a critical time for young women, building the foundation for successful reproduction and a healthy adulthood. However, in this study, nutritional status of the adolescent mothers was not so satisfactory. Basic knowledge of nutrition of the mothers are poor followed through poor attitude and practice. Present KAP study data are essential to help plan, implement and evaluate nutritional planning & intervention work. This study can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action. Community-based adolescent-friendly health and nutrition education and services and economic development may improve the overall health and nutritional knowledge and status of adolescent mothers.

Abbreviations

WHO	: World Health Organization
UNICEF	:United Nations International Children's Emergency Fund
HNPSP	: Health Nutrition and Population Sector Program
BDHS	: Bangladesh - Demographic and Health Survey
KAP	: Knowledge, Attitude, Practice
ACSM	: Advocacy, Communication and Social Mobilization
BMI	: Body Mass Index
UN	: United Nations
NCHS	:National Center for Health Statistics
SES	:Socio Economic Status
HDI	:Human Development indicators
CED	: Chronic Energy Deficiency
SSC	: Secondary School Certificate
RDA	: Recommended Dietary Allowance

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Chapter 1
Introduction

1.1 Introduction

Adolescence is a significant period of human growth and maturation; unique changes occur and many adult patterns are established during this period. In addition, the proximity of adolescence to biological maturity and adulthood may provide final opportunities for preventing adult health problems. Human growth and maturation are continuous processes, and transitions from childhood into adulthood are not abrupt. In contrast with the previous age groups, which are defined by chronologic age, adolescence begins with pubescence, the earliest signs of development of secondary sexual characteristics, and continues until morphologic and physiologic changes approximate adult status, usually near the end of the second decade of life.

Whereas adolescence is clearly an important period in human development, it has often failed to receive the attention given to earlier periods in childhood with regard to health-related uses and interpretations of anthropometry. Historically, the rapid changes in somatic growth in adolescence, the problems of dealing with variation in maturation, and the difficulties involved in separating normal variations from those associated with health risks have all discouraged researchers from developing a body of knowledge about adolescent anthropometry that would link it directly to health determinants and outcomes.[1]

The World Health Organization (WHO) defines adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to19. According to UNICEF there are 27.7 million adolescents aged 10-19 years in Bangladesh–13.7 million girls and 14 million boys – making up about one fifth of the total population.[2] Generally girls begin their adolescent growth at 9 years of age; the pubertal growth lasts within two to four years, with the average rate of linear growth being 5-6 cm/year.[3] Most adolescents have limited scope for acquiring knowledge and skills for their self-development and protection. In Bangladesh (2011) adolescents comprised 21% of Bangladeshi's total population. Of these figures 52% are male while 48% are females. Moreover, adolescents tend to avoid health care providers for reproductive health problems because of shyness, lack of knowledge, and absence of adolescent friendly sources of care. Under the Health Nutrition and Population Sector Program (HNPSP) of the Government of Bangladesh, both married and unmarried adolescents had been identified as undeserved population and thus a priority target group for a variety of reproduction and sexual health services. According to report by

the south-south center (2000), Bangladesh, almost 60% of adolescent girls are married off before they reach the age of 18 years. One third of them start child bearing in their teenage years, which about 28% of adolescent girls are already mothers. It has been shown the teen mothers are more likely to suffer from severe complications during delivery and infants born to adolescent mothers have a greater possibility of dying early. Overall, adolescent girls in the age group of 15-19 contribution 20% of the total babies born in a given year. Analysis of available data suggests that adolescent in Bangladesh are exposed to the reproductive health risks as adolescent in other developing countries. Compared with other age group, adolescent in Bangladesh tend to have less contact with health care systems, regardless of their need for specific services (SC/UK, 2000). In Bangladesh (2000) adolescents comprised 23% of Bangladeshi's total population or approximately 30 million people. In 2001 it has been grown 26% of the total population and 16.2% belong to the age group 10-19 years. [2]

Bangladesh's rates of child marriage and adolescent motherhood are among the highest in the world. The eradication of child marriage is slowly occurring however, the rates are still high with 66 per cent of girls are married before the age of 18. Over one third of girls are married before the age of 15. Legally, the minimum age of marriage is 21 for boys and 18 for girls. Early marriage leads to early pregnancy. [4]

According to reports of BDHS 2014, nearly 1/3 girls of age between 15-19 years have begun childbearing and the percentage is 31%. [5] The consequences of early childbearing are felt by society as well as the families directly affected. The incidence of births to very young women, both married and unmarried is growing; each year approximately 13 million children are born to young mothers. The percentage of live births to mothers under the age of 20 ranges from 20% in some African and Caribbean countries, to 10-15% in many Latin American countries, 5-10% in Asia, and 1% in Japan.

Early childbirth is especially dangerous for adolescents and their infants. Compared to women between the ages of 20-35, pregnant women under 20 are at a greater risk for death and disease including bleeding during pregnancy, toxemia, hemorrhage, prolonged and difficult labor, severe anemia, and disability. Life-long social and economic disadvantages may be a consequence of teenage birth. Teen mothers tend to have larger completed family sizes, shorter birth intervals resulting in both poorer

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health status for the family, and a more severe level of poverty. The children also suffer; teens mothers have a higher incidence of low birth weight infants which is associated with birth injuries, serious childhood illness, and mental and physical disabilities. [6] Hence the young mother's nutritional status is very important.

Adolescence is a crucial part of life. During this period, adolescents gain up to 50% of their adult weight, 20% or more adult height and 50% of their adult skeletal mass. [7]

Nutrition influences growth and development throughout infancy, childhood and adolescence; it is, however, during the period of adolescence that nutrient needs are the greatest. [8] About 1200 million adolescents in the world's and about 19% of the total population faces a series of serious nutritional challenges in developing country. [9] During shortage of food, most families give more attention that babies are well nourished rather adolescent. Inadequate diet can delay or impair healthy development. Stunting can occur in childhood or during adolescence. In some cultures, girls are fed last and fed least. In girls, poor nutrition can delay puberty and lead to the development of a small pelvis. [10] Poor nutrition starts before birth, and generally continues into adolescence and adult life and can span generations. Chronically malnourished girls are more likely to remain undernourished during adolescence and adulthood, and when pregnant. They are more likely to deliver low birth-weight babies. [11]

If adolescents are well nourished, they can make optimal use of their skills, talents and energies and be healthy and responsible citizens and parents of healthy babies tomorrow. To accomplish such a task, and in order to break the intergenerational cycle of malnutrition, a special focus is needed for overcoming adolescent malnutrition. One of the ways to break the intergenerational cycle of malnutrition is to improve the nutrition of adolescent girls prior to conception. [12]

Implementing efforts to improve nutrition and measuring their impact requires suitable indicators and tools. Indicators of nutritional status are the most common indicators for assessing the impact of interventions with a nutrition focus. Formulating and designing targeted programs and interventions, however, require more than just measuring nutritional status; they require a thorough understanding of what people actually eat and what personal factors underlie people's dietary habits.[13]

A KAP survey is a representative study of a specific population to collect information on what is known, believed and done in relation to a particular topic — in this case adolescent mother's nutrition. In most KAP surveys, data are collected orally by an interviewer using a structured, standardized questionnaire.[14] These data then can be analyzed quantitatively or qualitatively depending on the objectives and design of the study. A KAP survey can be designed specifically to gather information about Adolescent mother's nutrition -related topics, but it may also include questions about general health practices and beliefs.[15]

Dietary habits learnt in early life are likely to be carried to adulthood. Nutrition knowledge and positive attitude are known to influence dietary practices. Poor dietary practices are major contributors to the development of chronic non-communicable diseases. In order to promote healthier eating habits, nutrition knowledge is believed to be important. However, nutrition knowledge alone may not be sufficient to change dietary habits hence in addition there is need to mold a positive attitude toward healthy eating early in childhood.[16]

KAP survey data are essential to help plan, implement and evaluate ACSM (Advocacy, communication and social mobilization) work.[15] A KAP survey gathers information about what respondents know about adolescent mother's nutrition, what they think about disease or about the health system, and what they actually do with regard to seeking care or taking other action.[17] KAP surveys can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action. To some extent, they can identify factors influencing behavior that are not known to most people, reasons for their attitudes, and how and why people practice certain health behaviors.[19] KAP surveys may be used to identify needs, problems and barriers in program delivery, as well as solutions for improving quality and accessibility of services. The data collected enable program managers to set adolescent mother's nutrition program priorities, to estimate resources required for various activities, to select the most effective communication channels and messages, to establish baseline levels and measure change that results from interventions, and for advocacy and the fundamental information needed to make strategic decisions.[18]

In our cases, the adolescent mothers of the rural area of the Bangladesh remain vulnerable to different types of health related problem due to insufficient knowledge, attitude and practice (KAP). So, the objective of this study is to assess the adolescent mother's KAP on nutrition, which includes socio economic profile, nutrient components, dietary intake pattern and cooking method, the nutrition status of the mother and make potential recommendations on the basis of study findings.[19]

1.2 Rational of The Study

1. Present KAP study data are essential to help plan, implement and evaluate nutritional planning & intervention work. This KAP survey gathers information about what respondents know about adolescent mother's nutritional status, what they think about the health system, and what they actually do with regard to seeking care or taking other action. This study can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action.

2. Adolescent period is one of the most vital building period in human life. Adolescents go through drastic physical & hormonal change. And marriage in adolescent period increases the risks of maternal mortality, complications in pregnancy and impaired fetal development (small-for-gestational-age) and may prevent any further maternal height gain.

3. Malnutrition among adolescent mothers is a serious public health and complex problem in developing countries like Bangladesh. In Bangladesh there is a very few study conducted on adolescent mothers.

4. Poor nutrition is the single most important threat to the world's health. Assessing the nutritional status will enable to assess the nutritional need of adolescent mother and their lack of knowledge and malpractice.

1.3 OBJECTIVES

1.3.1 GENERAL OBJECTIVE:

The study is revealed to assess the nutritional status and nutrition related knowledge, attitude and practice (KAP) of adolescent mothers in a selected rural area of Bangladesh.

1.3.2 SPECIFIC OBJECTIVES:

- ❖ To assess the anthropometric measurement by BMI of the respondents.

- ❖ To assess the nutrition related knowledge, attitude & practice of the respondents.

- ❖ To assess the dietary pattern of the participants.

Chapter 2
LITERATURE REVIEW

2.1 Adolescents: Who are they?

The term youth encompasses ages 10 to 24 years, while the term adolescents as defined by WHO (1986a) includes persons aged 10-19. Adolescents are sometimes designated as 'children', for instance, in the UN Convention on the Rights of the Child of 1989, which applies to all individuals below 18 years of age. The period of gradual transition from childhood to adulthood that normally begins with the onset of signs of puberty, is characterized by important psychological and social changes, not only physiological change. It is difficult to define in universal terms for there are important cultural differences. Depending on societies, the transition may be quick and the very notion of adolescence does not really exist, for instance where girls marry early and do not go to school. On the other hand, the transition of adolescence may extend over several years where young people remain in school and marry late, like in developed countries and increasingly in urban areas of developing countries (Paxman and Zuckerman, 1987). [13] Adolescents are far from being a homogeneous group, in terms of development, maturity and lifestyle. Even for a given place and age, there is a great deal of diversity depending on personal and environmental factors. Adolescence may be divided into three developmental stages based on physical, psychological and social changes (WHO/UNICEF 1995): [14]

- Early adolescence, 10/13-14/15 years;
- Mid adolescence, 14/15-17;
- Late adolescence, between 17-21, but variable.

2.2 Nutritional status:

Nutritional status is defined as the condition of the body in those respects influenced by the diet; the levels of nutrients in human body and the ability of those levels to maintain normal metabolic integrity (Saxena and Saxena, 2009). Essential nutrient must be provided to body by the diet otherwise its inadequate causes health problems such as malnutrition. According to WHO (2006) adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to19. Biological processes drive many aspects of this growth and development, with the onset of puberty marking the passage from childhood to adolescence (Mulugeta et al., 2009) [12] Growth during adolescence is faster than at any other time in an individual's life except the first year. Good nutrition during adolescence is critical to cover the deficits suffered during childhood and should include nutrients

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required to meet the demands of physical and cognitive growth and development, provide adequate stores of energy for illnesses and pregnancy and prevent adult onset of nutrition-related diseases (WHO, 2006).

Like other South-Asian countries, Bangladesh has shown deficiencies in the intake of all nutrients, particularly iron, calcium, vitamin A and vitamin C. The main reasons are mainly the low educational level of parents and low family income. Dietary intake with respect to adequate availability of food in terms of quantity and quality (particularly, the mean caloric intake), ability to digest, absorb and utilize food and the social discriminations against girls can greatly affect the adequate nutrition of adolescents.[18] Many boys and girls enter adolescence undernourished, making them more vulnerable to disease and early death. Conversely, overweight and obesity another form of malnutrition with serious health consequences is increasing among other young people in both low and high income countries (Cole et al., 2007).[17]

Adequate nutrition and healthy eating and physical exercise habits at this age are foundations for good health in adulthood. Adolescents are the best human resources. But for many years, their health has been neglected because they were considered to be less vulnerable to disease than the young children or the very old. Their health attracted global attention in the last decade only.[20] As adolescents have a low prevalence of infection compared to under-five children, and of chronic disease compared to ageing people, they have generally been given little health and nutrition attention, except for reproductive health concerns (Kalhan et al., 2010)[19]. Malnourished adolescent girls who have babies at a young age are likely to experience, and will be less able to withstand, complications because the body has not yet reached maturity.[22] Maternal mortality is higher in anemic women. Even when they survive, poorly nourished adolescent mothers are more likely to give birth to low birth-weight babies, perpetuating a cycle of health problems which pass from one generation to the next (Kumar, 2012)[23]. Hence it is essential to assess the nutritional status of adolescence girls, especially developing countries like Bangladesh.

2.3 Nutritional status of adolescent girls in Bangladesh

Special attention should be given to adolescent girls, who need to be well-nourished for their own immediate development and for the future nutritional demands of childbearing. Adolescence is a critical time for young women, building the foundation

for successful reproduction and a healthy adulthood and later life. Young women must enter adulthood with good nutritional stores to remain strong and healthy throughout their child-bearing years and into old age. Good nutrition is especially important for adolescent girls to meet future needs of pregnancy and breastfeeding.[24]

Early pregnancies can be harmful to the health of girls who, themselves, are still growing. Young girls' bodies are still developing and usually are not ready to support the extra burden of pregnancy and child birth.[25] Special care must be taken during adolescent pregnancy to insure that the young mother receives sufficient food for her own increased needs, as well as for the needs of the unborn baby.[23]

The phenomenal growth that occurs in adolescence, second only to that in the first year of life, creates increased demands for energy and nutrients. Total nutrient needs are higher during adolescence than any other time in the lifecycle. Nutrition and physical growth are integrally related; optimal nutrition is a requisite for achieving full growth potential. Failure to consume an adequate diet at this time can result in delayed sexual maturation and can arrest or slow linear growth.[26]

2.4 Adolescent mothers in rural area of Bangladesh

Adolescence is a period of rapid growth and development. Approximately 50% of adult body weight and 15% of final adult height is attained during adolescence, along with changes in body shape and composition. In South Asian countries such as Bangladesh, chronic under nutrition can delay physical maturation and extend the adolescent growth period beyond 20 years of age, coinciding with the age of first pregnancy.[27] Adolescents in developing countries exhibit poor growth and nutritional status. A study of rural Bangladeshi teenagers showed that stunting (height-for-age ,3rd percentile of the National Center for Health Statistics/WHO reference) and thinness (BMI for-age ,5th percentile of the National Center for Health Statistics/WHO reference) were prevalent among 48 and 60% of adolescent girls, respectively. [28] Other than genetic factors, adverse environmental conditions such as low socioeconomic status (SES) and poor quality diets explain the suboptimal growth of teenagers.[29]

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Conventionally, it has been accepted that growth is largely completed by the time adolescents become pregnant, because pregnancy occurs subsequent to menarche, when growth rate drops to a nadir.[30] However, in a recent study conducted in Camden, NJ, it was demonstrated that a large proportion of pregnant adolescents were still growing (using knee height changes as a measure of growth), reflecting continuing growth in stature during and following pregnancy. This finding may be particularly relevant to malnourished adolescent girls in developing countries whose physical growth period is extended and in whom pregnancy occurs at an early age.[31]

A large proportion of adolescents in developing countries enters pregnancy with a poor nutritional status and is likely to have suboptimal dietary intake during pregnancy and lactation. Consequently, in severely undernourished pregnant adolescents, maternal nutritional depletion and impaired growth of the fetus are likely to occur concurrently due to the competition for nutrients between the growing teenage mother and the fetus.[32]

2.5 Nutritional Status of Adolescent mothers in Bangladesh

Women who become pregnant before age 20 are considered as early childbearing mothers.[29] General wellbeing and nutritional requirements of these young mothers have recently received more attention especially in developing and under-developed countries. It has been shown that early childbearing mothers were at higher risk of prenatal morbidities such as gestational diabetes, gestational hypertension and preterm labour compared to the general population. [33] The risk of pregnancy related mortality for mothers aged 15 to 19 was twice as high compared to those aged 20 and older. The mortality risk would be 5–7 times higher for mothers who became pregnant before age 15. Some anthropometric and socio-economic factors had been associated with adverse health consequences among adolescent mothers. The pelvic bone of young mothers may not have fully developed to accommodate the passage of the babies, increasing the risk of obstructed labour.[34] A recent longitudinal study on African American community in Chicago reported that adolescent mothers were more likely to be unemployed, live in poverty and dependent on social welfare. Body mass index (BMI) is calculated from a person's weight and height.[35] It is an important indicator of the nutritional status for a population. BMI value of less than or equal to 18.5 kg/m2 is considered as underweight, and this is a common finding among people

suffering from chronic energy deficiency. Underweight women were associated with higher risk of adverse health outcomes like hip fractures. Pregnant mothers who were underweight have higher risk of perinatal mortality, and delivering low birth weight babies.[26] The mean age of first marriage for Bangladeshi women was 15.69 ± 2.97 years. Based on a report by Kamal in 2012, the practice of teenage marriage and early childbearing were still common in Bangladesh despite substantial improvements in various Human Development indicators (HDI).[18] In the urban areas of Bangladesh, researchers have reported that underweight was very common among ever-married non-pregnant women. Prevalence of chronic energy deficiency (CED, with BMI <18.5 kg/m2) was very high among women from poor families in both rural and urban areas of this country (38.8 % rural, 29.7 % urban poor). More recently, Hossain et al. studied the association between BMI and sociodemographic factors among ever-married non-pregnant Bangladeshi women (aged 15–49 years) based on birth year cohorts from 1957 to 1992. They reported an increasing trend of BMI during the first sixteen years from 1957 to 1972, but a decreasing trend thereafter of Bangladeshi ever married women aged 15–49 years.[22] Information on the importance of adequate nutritional for childbearing mothers would not only help the community to understand their needs, but also indirectly help to promote the well being on their children who would eventually grow up and contribute as leaders or workforce for the nation. This is especially true in Asian communities because of the traditional role of mothers in the family and the community.[31] Studies have already shown that nutritional status of married and unmarried women was influenced by various demographic and socio-economic factors such as age, education level, wealth index, age at first marriage, number of ever-born children, residence, religion, occupation, place of delivery and method of delivery.[27] Two of these studies were focused on married Bangladeshi women in their reproductive age, and two others were conducted on Indian women. In Bangladesh, special attention should be given to early childbearing mothers because this subgroup of the population was associated with high risk of adverse health outcome compared to mothers of older age.[33] Moreover, practice of teenage marriage remained common in Bangladesh. There has not been any published study on the general health for this group of population in Bangladesh. We therefore decided to use the nutritional status as proxy for general health, and study risk factors related to the general health status of early childbearing mothers in this country.[29]

Chapter 3
Methods and materials

3.1 Methods and materials

To assess, analyze and evaluate the lifestyle of adolescent mothers, their nutritional status and KAP; various types of anthropometric, socio economic, food intake pattern and knowledge about nutrition have been collected from adolescent mothers of the target population. For this purpose, 300 adolescent mothers were selected randomly for data collection. The study was carried out at rural areas of Kushtia district.

3.2 Study design:

The study was cross sectional in nature. The data were collected at one point of time from samples selected to describe the situation of nutritional status of adolescent mothers.

In a cross-sectional study, data are collected on the whole study population at a single point in time to examine the relationship between health related state and other variables of interest. Cross-sectional studies therefore provide a snapshot of the frequency of a health related characteristics in a population at a given point in time. This methodology can be used to assess the necessity of health needs of a population, for example, and is therefore particularly useful in informing the planning and allocation of health resources.

3.3 Study population:

Adolescent mothers aged between 15-19 years

3.4 Study area:

Kushtia Sador Upazila, Mirpur Upazila, Daulatpur Upazila, Bheramara Upazila of Kushtia district.

3.5 Data Collection period:

Between April, 2015 to October, 2015.

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3.6 Sample size calculation

$$n = \frac{Z^2 pq}{d^2} = \frac{Z^2 p(1-p)}{d^2}$$

Where,

n = Sample size

p = Proportion in the target population (p=0.50 adolescent mother is 50%).

q = $1-p$

z = Standard normal deviation. Usually assumed at 1.96 which corresponds to 95% confidence limit.

d = Degree of accuracy (considering 5% error acceptable)

Thus, n $= \dfrac{1.96^2 \; X \; (0.50 X 0.50)}{(0.05)^2} = 384 \sim 300$

3.7 Calculation of Body mass index (BMI)

Body Mass Index (BMI) is an anthropometric index of weight and height that is defined as body weight in kilograms divided by height in meters squared. BMI of adolescent girls were calculated by using the following equation:

Body mass index (BMI) = Weight in kilogram (kg)/ Height in meter^2 (m^2)

BMI is the commonly accepted index for classifying adiposity in adults and it is recommended for use with children and adolescents (Ulijaszek and Kerr, 1999).

3.8 Analysis of data:

Data collected through questionnaire. Collected data was coded rightly and put on to entry by using suitable data entry software. Data analysis was done by SPSS version 20.

Chapter 4
Result

4.1 Socioeconomic feature

Table I: Distribution of the study respondents by demographic characteristic (n=300)

Demographic characteristic	Number of patients	Percentage
Age (in years)		
16 – 17	87	29.0
18 – 19	213	71.0
Mean±SD	18.0±1.1	
Range (min-max)	16-19	
* 16-17 is defined as 16 .0to 17.9 years age 18-19 is defined as 18.0 to 19.9 years age		
Occupational status		
House wife	179	60.0
Student	56	18.7
Household worker	41	13.3
Others	24	8.0
Educational status		
Primary	109	36.7
Secondary	67	22.0
SSC	56	18.7
Illiterate	68	22.7
Religion		
Muslim	274	91.3
Hinduism	26	8.7
Monthly income (Taka)		
5000- 7000	98	32.6
7000-10000	87	29.3
> 10000	115	38.0
Types of family		
Nuclear	43	14.0
Joint	257	86.0
Family member		
Three	16	5.3
Four	26	8.7
Five	147	49.3
More than six	111	36.7
House living		
Kacha	29	9.3
Paka	119	40.0
Tin shed	152	50.7
Number of children		
One	234	78.0
Two	66	22.0

Table I shows demographic characteristic of the study respondents; it was observed that mean age was found 18.0±1.1 years with range from 16 to 19 years. Majority (60.0%) respondent were housewives. More than one third (36.7%) respondent had

completed primary education, 114(38.0%) had monthly family income >10000 taka. Majority 258(86.0%) respondents were found joint family. Almost half (49.3%) of the respondents had five number's of family member. More than half (50.7%) respondents lived in tin shed. More than three fourth (78.0%) respondents had one child. Majority (91.3%) of the respondents came from Muslim family.

Table II: Distribution of the Study Respondents by BMI (n=300)

BMI (kg/m2)	Number of Respondent's	Percentage
<18.5 (Under weight)	130	43.3
18.5-22.9 (Normal)	160	53.3
23-24.9 (Over weight)	10	3.4
Mean±SD		18.8±1.9
Range (min-max)		15.1-24.8

Table II shows BMI of the study respondents, it was observed that the more than half (53.3%) patients BMI had 18.5-22.9 (Normal), 130(43.3%) had <18.5 (Under weight) and 10(3.4%) had 23-24.9 (Over weight). The mean BMI was 18.8±1.9 kg/m^2 with ranged from 15.1 to 24.8 kg/m^2.

Table III: Level of Knowledge regarding food item of the respondents (n=300)

Knowledge Indicators	Correct (%)	Incorrect (%)	Partially Correct (%)
knowledge about nutrition	58 (19.3)	211 (70.7)	31 (10.0)
Source of energy rich food	137 (45.3)	120 (40.0)	43 (14.7)
Source of Vitamins & minerals	158 (52.7)	119 (39.3)	23 (8.0)
Consequence of vitamin A deficiency disorder	81 (26.7)	200 (66.7)	19 (6.7)
Source of iron rich foods	58 (19.3)	196 (65.3)	46 (15.3)
Consequence of iron deficiency disorder	54 (18.1)	193 (64.4)	53 (17.4)
Source of iodine rich food	131 (43.3)	157 (52.7)	12 (4.0)

Table III shows level of knowledge regarding food item of the respondents, it was observed that more than half (52.7%) respondents had correct source of vitamins & minerals, 119(39.3%) incorrect and 23(8.0%) partially correct. Followed by 137(45.3%) had correct source of energy rich food, 120(40.0%) incorrect and 43(14.7%) partially correct. One hundred thirty one (43.3%) had correct source of iodine rich food, 157(52.7%) incorrect and 12(4.0%) partially correct. Other findings are depicted in the above table.

Table IV: Level of Knowledge of the respondents (n=300)

Knowledge Indicators	Correct (%)	Incorrect (%)	Partially Correct (%)
During pregnancy, mother needs increased amount of food	160 (53.3)	128 (42.7)	12 (4.0)
During lactation, mother needs increased amount of food than pregnancy	90 (30.0)	176 (58.7)	34 (11.3)
knowledge about consequence of mal-nutrition in adolescent motherhood	61 (20.0)	193 (64.7)	64 (15.3)
Source of safe drinking water	276 (92.0)	21 (7.0)	3 (1.0)
knowledge about proper washing vegetables & fruits	117 (39.3)	183 (60.7)	0 (0.0)
Importance of oil for absorption of vitamin	12 (4.0)	257 (86.0)	31 (10.0)

Table IV shows level of knowledge of the respondents, it was observed that majority (92.0%) respondents had correct source of safe drinking water, 21(7.0%) incorrect and 3(1.0%) partially correct. Followed by 160(53.3%) had correct during pregnancy, mother needs increased amount of food, 128(42.7%) incorrect and 12(4.0%) partially correct. One hundred seventeen (39.3%) had correct knowledge about proper washing vegetables & fruits, 183(60.7%) incorrect. Other findings are depicted in the above table.

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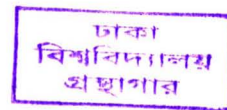
Table V: Attitude towards basic nutrition (n=300)

	Agree (%)	Disagree (%)	Not Sure (%)
The importance of nutrition and diet in human health	179 (60.0)	3 (1.0)	118 (39.0)
Foods are the source of nutrient	104 (34.7)	20 (6.7)	176 (58.7)
Anemia is the result of intake less amount of iron and folic acid	58 (19.3)	45 (14.7)	197 (66.0)
Vitamin C helps to absorb iron in body	8 (2.7)	73 (24.7)	219 (72.7)
Adolescent nutrient requirement is high	108 (36.0)	8 (2.7)	184 (61.3)
Good dietary practice is important for mother and child	245 (82.0)	0 (0.0)	55 (18.0)
Lack of proper nutrition turns to severe mal-nutrition in adolescent motherhood	214 (71.3)	0 (0.0)	86 (28.7)
Food taboo can be the cause of mal-nutrition	90 (30.0)	11 (4.0)	199 (66)
Vegetables & fruits should be washed before cutting	150 (50.0)	83 (26.7)	67 (23.3)
Iodized salt is good for health	138 (46.0)	5 (1.3)	157 (52.7)
Hygiene practice protects from food contamination	256 (85.3)	0 (0.0)	44 (14.7)

Table V shows attitude towards basic nutrition of the respondents, it was observed that majority (85.3%) respondents had hygiene practice protects from food contamination in agree and 44(14.7%) in not sure. Followed by (82.0%) respondents had good dietary practice is important for mother and child in agree and 55(18.0%) in not sure. Almost three fourth (71.3%) respondents had lack of proper nutrition turns to severe mal-nutrition in adolescent motherhood in agree and 86(28.7%) in not sure. Other findings are depicted in the above table.

4.2 Nutritional Knowledge

Table VI: Mean distribution of accurate knowledge Score according to different respondent's age (n=300)

Age (in years)	n	Knowledge		P value
		Mean±SD	min, max	
16-17	87	5.6±3.9	0-14	0.001[s]
18-19	213	15.5±13.1	1-37	

s= significant

P value reached from ANOVA test

About the association between age with knowledge about nutrition status, the mean knowledge was 5.6±3.9 in age belonged to 16-17 years, and 15.5±13.1 in age belonged to 18-19 years. The mean knowledge regarding nutrition status was significantly (p<0.05) higher in older group of the patients.

Figure 1: Bar diagram showing mean accurate knowledge with age.

Table VII: Mean Distribution of accurate knowledge score according To occupational status (n=300)

Occupational status	n	Knowledge Mean±SD	Knowledge min, max	P value
Student	56	31.4±7.8	8-37	
House wife	179	9.3±8.6	0-35	0.001[s]
Household worker	41	5.4±3.4	1-11	
Others	24	1.3±0.5	1-2	

s= significant
P value reached from ANOVA test

Regarding the association between occupational status with knowledge about nutrition status, the mean accurate knowledge was 31.4±7.8 in student, 9.3±8.6 in housewives, 5.4±3.4 in household worker and 1.3±0.5 in other occupational status. The mean accurate knowledge regarding nutrition status was significantly (p<0.05) higher in student.
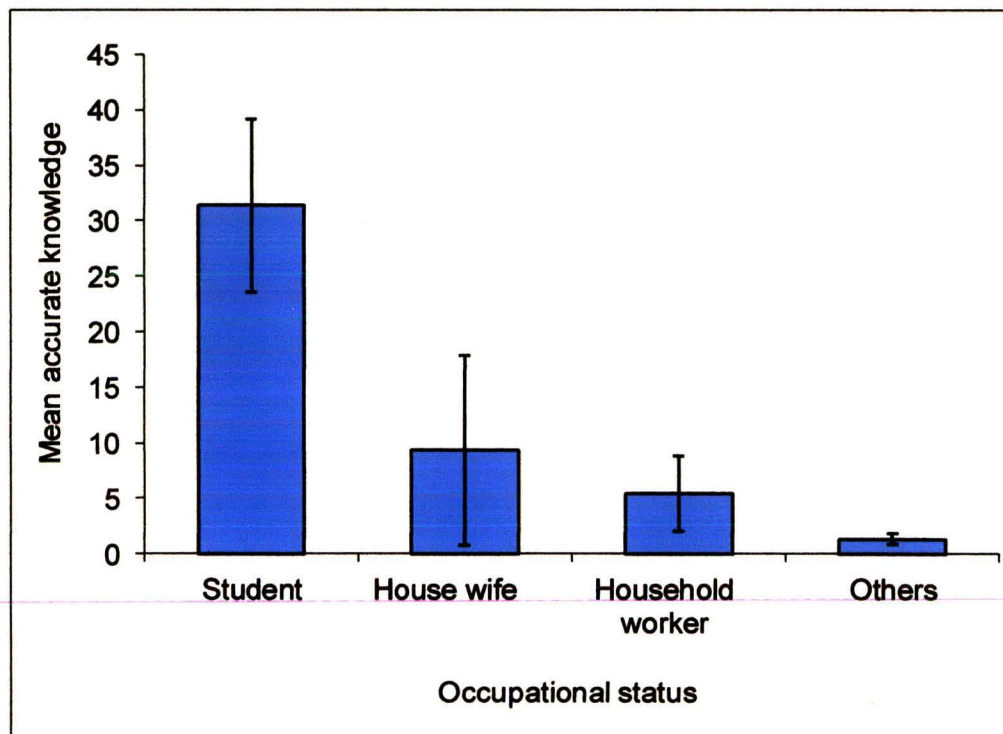
Figure 2: Bar diagram showing mean accurate knowledge with occupational.

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Table VIII: Mean distribution of accurate knowledge score according to educational status (n=300)

Educational status		Knowledge		P value
	n	Mean±SD	min, max	
Illiterate	68	1.8±1.4	0-6	
Primary	109	8.3±5.0	1-19	0.001[s]
Secondary	67	14.1±11.4	1-34	
SSC	56	27.4±10.4	8-37	

s= significant
P value reached from ANOVA test

Regarding the association between educational status with knowledge about nutrition status, the mean accurate knowledge was 1.8±1.4 in illiterate respondent, 8.3±5.0 in respondent who completed primary education, 14.1±11.4 in completed secondary education and 27.4±10.4 in completed SSC education. The mean accurate knowledge regarding nutrition status was significantly ($p<0.05$) higher in SSC educational status.
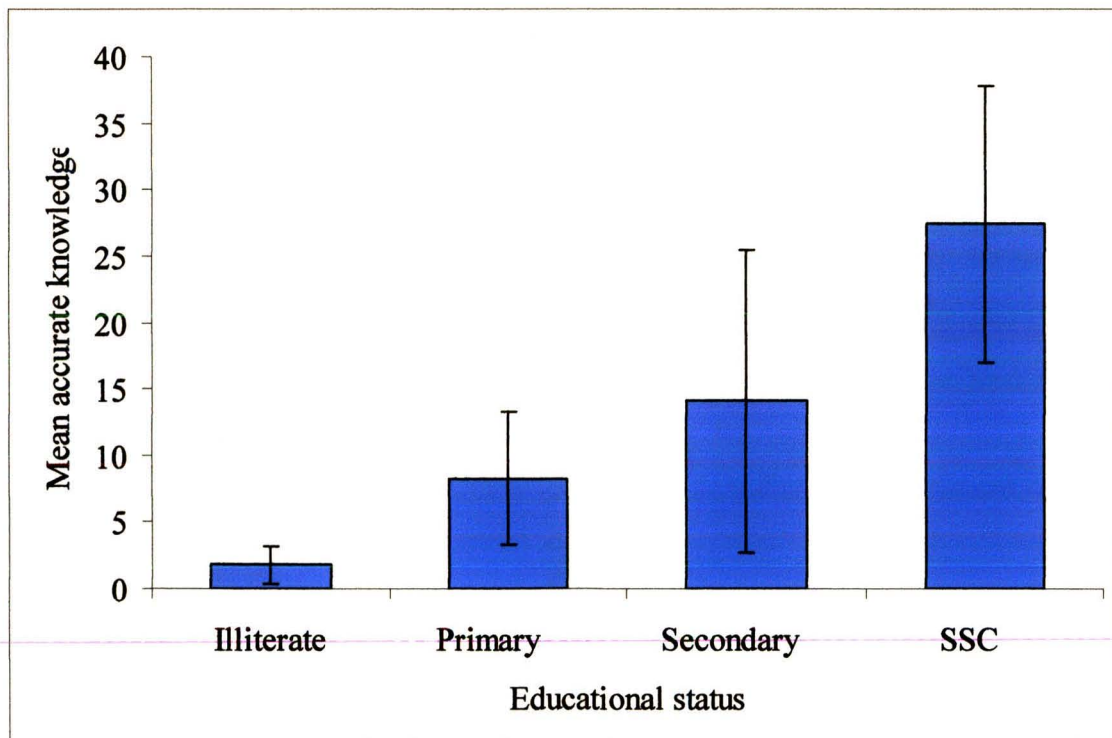
Figure 3: Bar diagram showing mean accurate knowledge with educational status.

Table IX: Mean distribution of accurate knowledge score according to monthly income (n=300)

Monthly income (taka)	n	Knowledge		P value
		Mean±SD	min, max	
5000- 7000	98	6.2±5.8	1-19	
7000-10000	87	8.8±6.5	0-35	0.001[s]
> 10000	115	19.6±13.3	2-37	

s= significant

P value reached from ANOVA test

Regarding the association between monthly income with knowledge about nutrition status, the mean correct knowledge was 6.2±5.8 came from 5000-7000 taka monthly income, 8.8±6.5 came from 7000-10000 monthly income and 19.6±13.3 came from >10000 monthly income. The mean accurate knowledge regarding nutrition status was significantly (p<0.05) higher in upper monthly income.
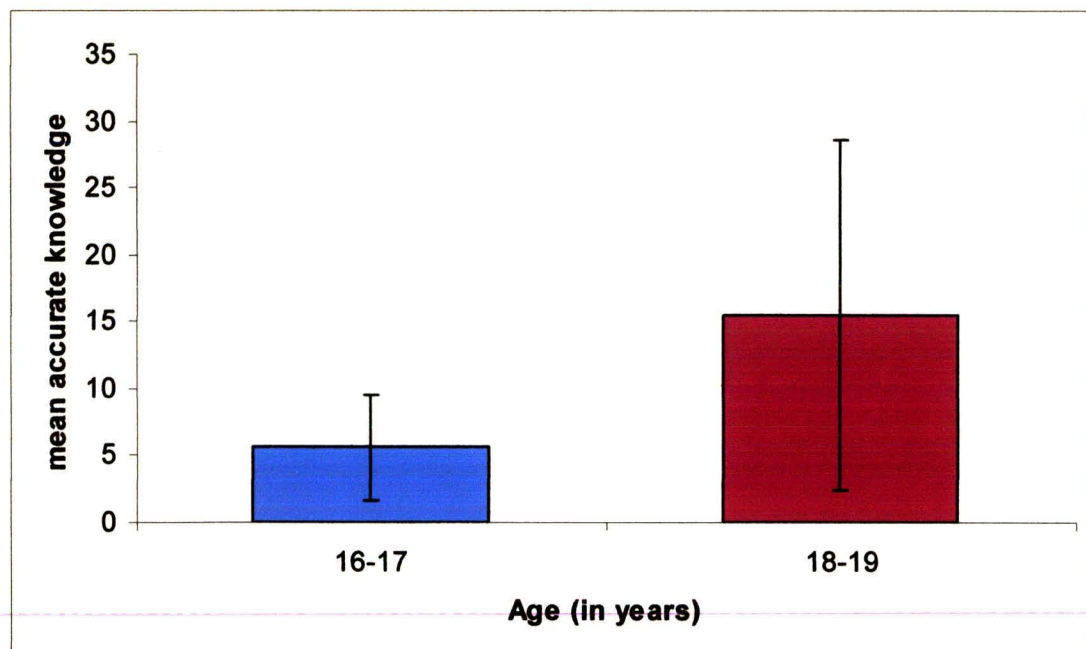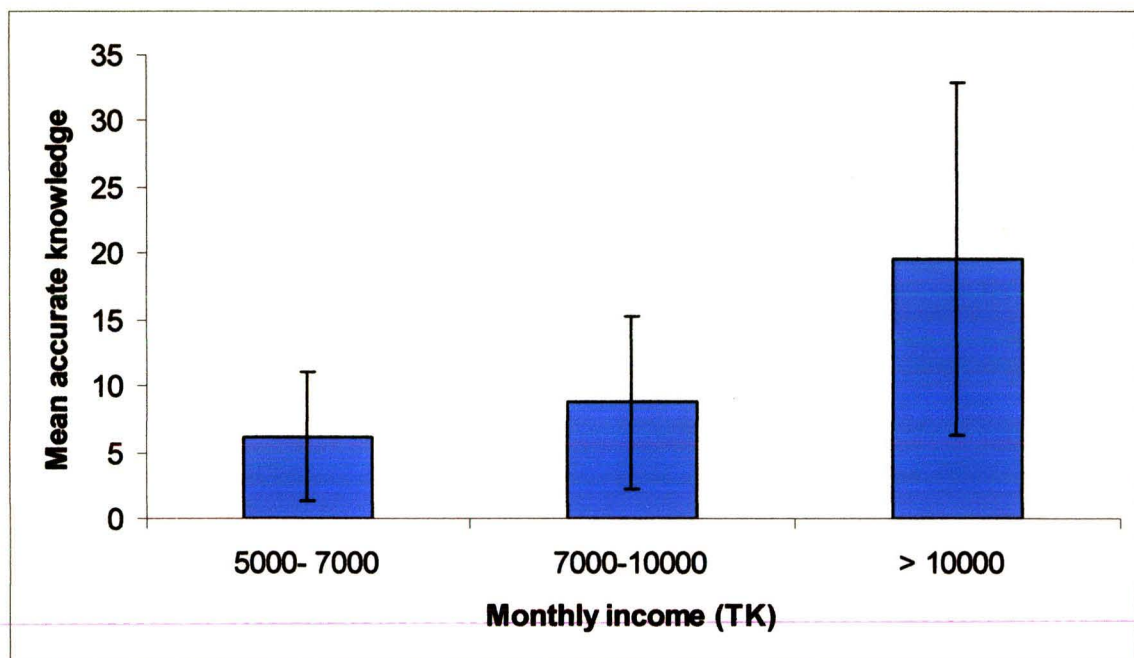

Figure 4: Bar diagram showing mean accurate knowledge with monthly income.

Table X: Mean distribution of accurate knowledge score according to family member (n=300)

Family member	n	Knowledge		P value
		Mean±SD	min, max	
Three	16	11.3±9.04	1-37	
Four	26	13.2±11.53	1-36	
Five	147	14.8±11.98	0-36	0.001[s]
More than six	111	7.3±5.58	1-36	

s= significant

P value reached from ANOVA test

Regarding the association between family member with knowledge about nutrition status, the mean correct knowledge was 11.3±9.04 in family member three, 13.2±11.53 in family member four, 14.8±11.98 in family member five and 7.3±5.58 in family member more than six. The mean accurate knowledge regarding nutrition status was significantly ($p<0.05$) higher in family member five.
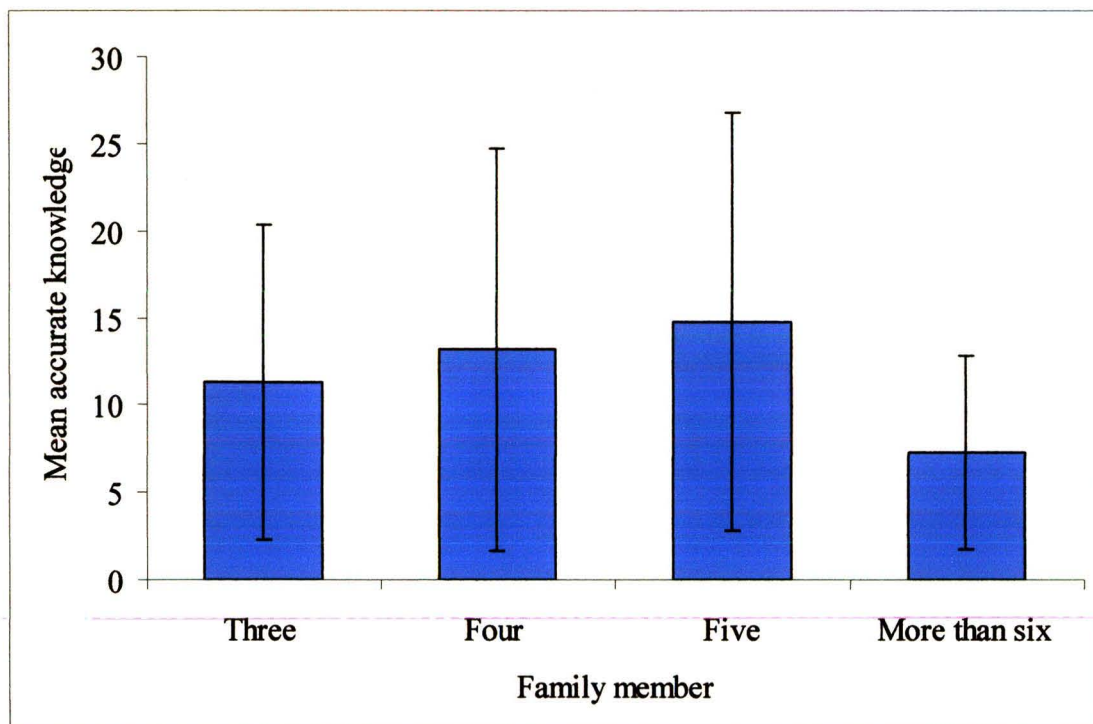
Figure 5: Bar diagram showing mean accurate knowledge with family member.

4.3 Nutritional Attitude

Table XI: Mean distribution of accurate attitude score according to respondent's age (n=300)

Age (in years)	Attitude			P value
	n	Mean±SD	min, max	
16-17	87	3.4±1.7	1-7	0.001[s]
18-19	213	5.9±3.2	1-11	

s= significant

P value reached from ANOVA test

Regarding the association between age with attitude about nutrition status, the mean correct knowledge was 3.4±1.7 in age belonged to 16-17 years and 5.9±3.2 in age belonged to 18-19 years. The mean accurate attitude regarding nutrition status was significantly (p<0.05) higher in older group of the respondent's.

Figure 6: Bar diagram showing mean accurate attitude with age.

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Table XII: Mean distribution of accurate attitude score according to respondent's occupational status (n=300)

Occupational status	n	Attitude Mean±SD	Attitude min, max	P value
Student	56	9.4±1.6	5-11	
House wife	179	4.6±2.7	1-10	0.001[s]
Household worker	41	3.4±1.7	1-7	
Others	24	2.9±0.4	2-3	

s= significant

P value reached from ANOVA test

Regarding the association between occupational status with attitude about nutrition status, the mean accurate attitude was 9.4±1.6 in student, 4.6±2.7 in housewives, 3.4±1.7 in household worker and 2.9±0.4 in other occupational status. The mean accurate attitude regarding nutrition status was significantly ($p<0.05$) higher in student.

Figure 7: Bar diagram showing mean accurate attitude with occupational status.

Table XIII: Mean distribution of accurate attitude score according to respondent's educational status (n=300)

Educational status	n	Attitude Mean±SD	Attitude min, max	P value
Illiterate	68	2.3±1.4	1-7	
Primary	109	4.4±1.9	1-9	0.001[s]
Secondary	67	5.8±2.9	1-10	
SSC	56	8.9±2.0	5-11	

s= significant

P value reached from ANOVA test

Regarding the association between educational status with attitude about nutrition status, the mean accurate attitude was 2.3±1.4 in illiterate respondent, 4.4±1.9 in respondent who completed primary education, 5.8±2.9 in completed secondary education and 8.9±2.0 in completed SSC education. The mean accurate attitude regarding nutrition status was significantly (p<0.05) higher in SSC educational status.

Figure 8: Bar diagram showing mean accurate attitude with educational status.

Table XIV: Mean distribution of accurate attitude score according to respondent's monthly income (n=300)

Monthly income (taka)	n	Attitude		P value
		Mean±SD	min, max	
5000- 7000	98	3.0±1.6	1-6	
7000-10000	87	4.8±2.8	1-10	0.001[s]
> 10000	115	7.4±2.8	3-11	

s= significant

P value reached from ANOVA test

Regarding the association between monthly income with attitude about nutrition status, the mean correct attitude was 3.0±1.6 came from 5000-7000 taka monthly income, 4.8±2.8 came from 7000-10000 monthly income and 7.4±2.8 came from >10000 monthly income. The mean accurate attitude regarding nutrition status was significantly (p<0.05) higher in upper monthly income.
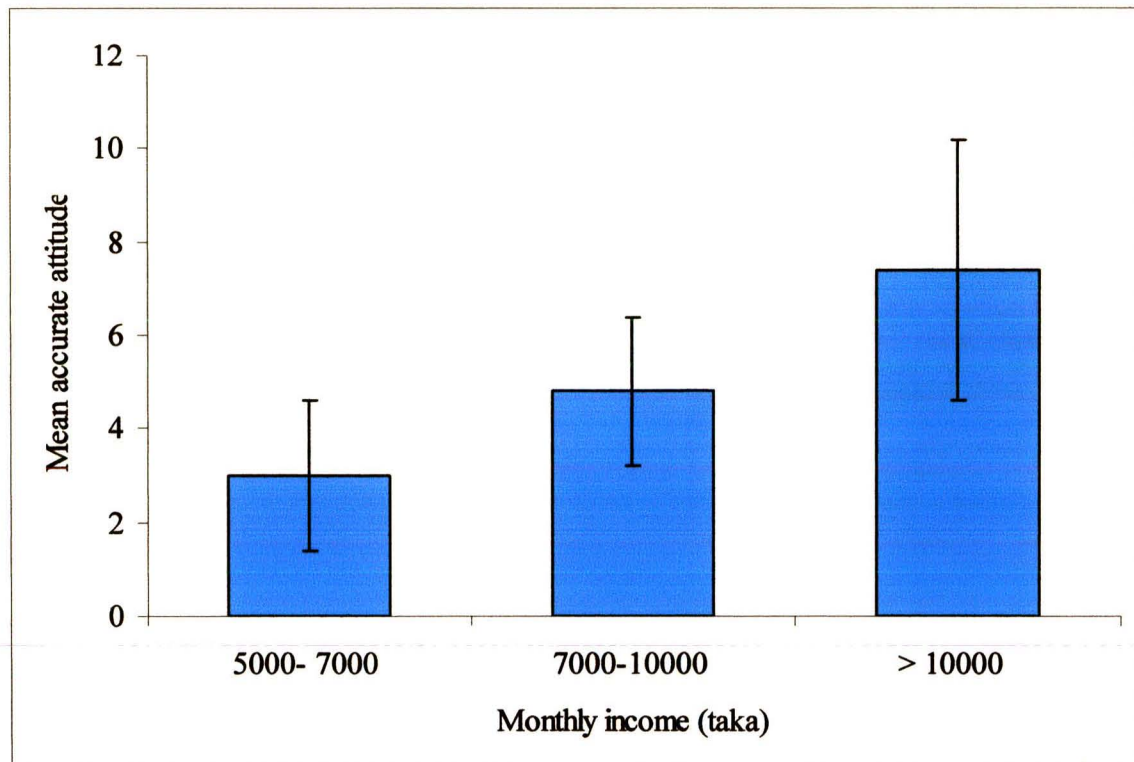
Figure 9: Bar diagram showing mean accurate attitude with monthly income.

Table XV: Mean distribution of accurate attitude score according to respondent's types of family (n=300)

Types of family	n	Mean±SD	min, max	P value
		Attitude		
Nuclear	43	5.7±3.5	1-11	0.237^{ns}
Joint	257	5.1±3.0	1-11	

ns= not significant

P value reached from unpaired t-test

Regarding the association between type of family with attitude about nutrition status, the mean correct attitude was 5.7±3.5 in nuclear family and 5.1±3.0 in joint family. The mean accurate attitude regarding nutrition status was not significantly (p>0.05) associated with type of family.

Table XVI: Mean distribution of accurate attitude score according to respondent's family member (n=300)

Family member	n	Attitude		P value
		Mean±SD	min, max	
Three	16	5.8±3.5	3-11	
Four	26	5.0±3.6	1-10	0.001[s]
Five	147	5.7±3.2	1-11	
More than six	111	4.2±2.3	1-10	

s= significant

P value reached from ANOVA test

Regarding the association between family member with attitude about nutrition status, the mean correct attitude was 5.8±3.5 in family member three, 5.0±3.6 in family member four, 5.7±3.2 in family member five and 4.2±2.3 in family member more than six. The mean accurate attitude regarding nutrition status was significantly ($p<0.05$) higher in family member three.
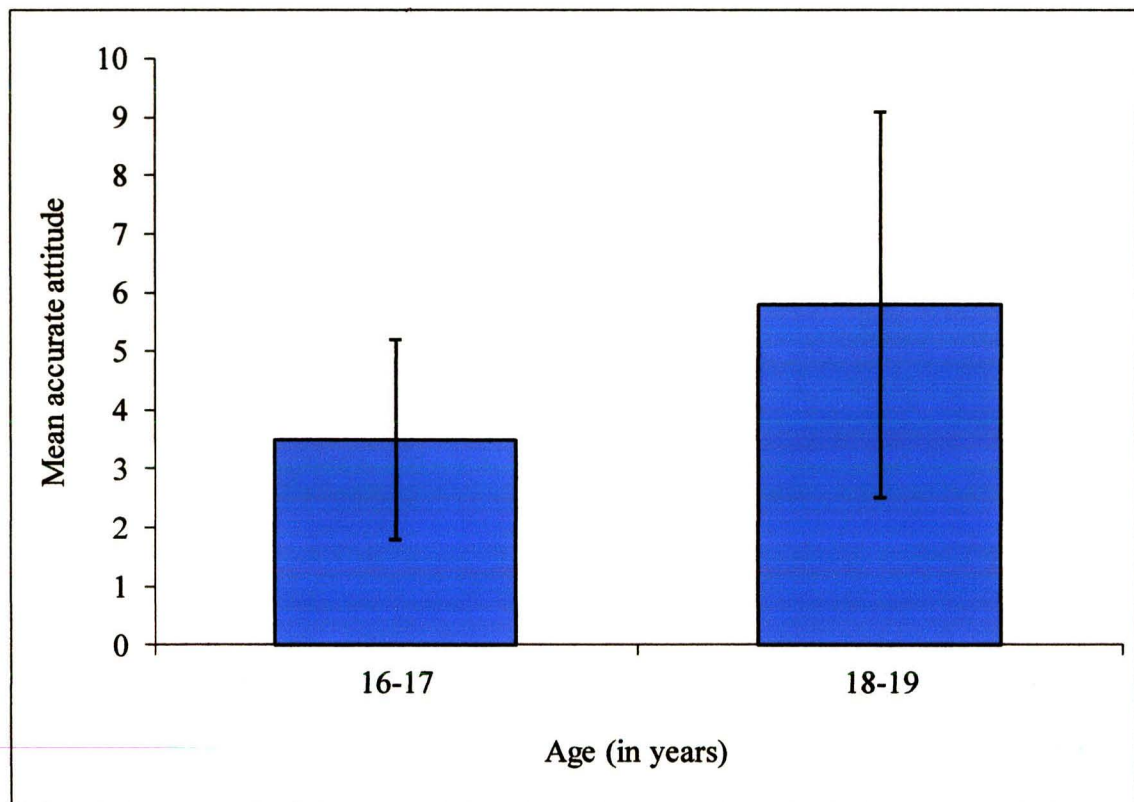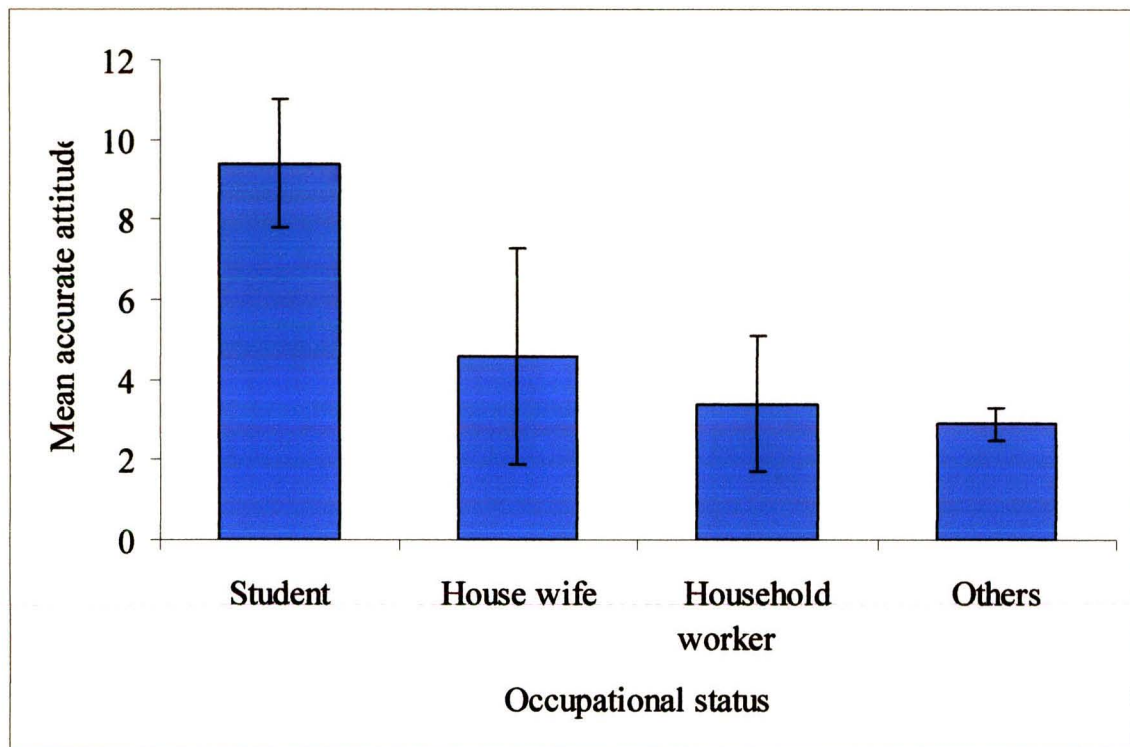

Figure 10: Bar diagram showing mean accurate attitude with family member.

Table XVII: Mean distribution of accurate attitude score according to respondent's house living (n=300)

House living	Attitude			P value
	n	Mean±SD	min, max	
Kacha	29	2.1±1.1	1-4	
Paka	119	6.3±3.0	1-11	0.001[s]
Tin shed	152	4.8±2.8	1-10	

s= significant

P value reached from ANOVA test

Regarding the association between house living with attitude about nutrition status, the mean correct attitude was 2.1±1.1 in kacha, 6.3±3.0 in paka and 4.8±2.8 in tin shed. The mean accurate attitude regarding nutrition status was significantly (p<0.05) higher in house living paka.
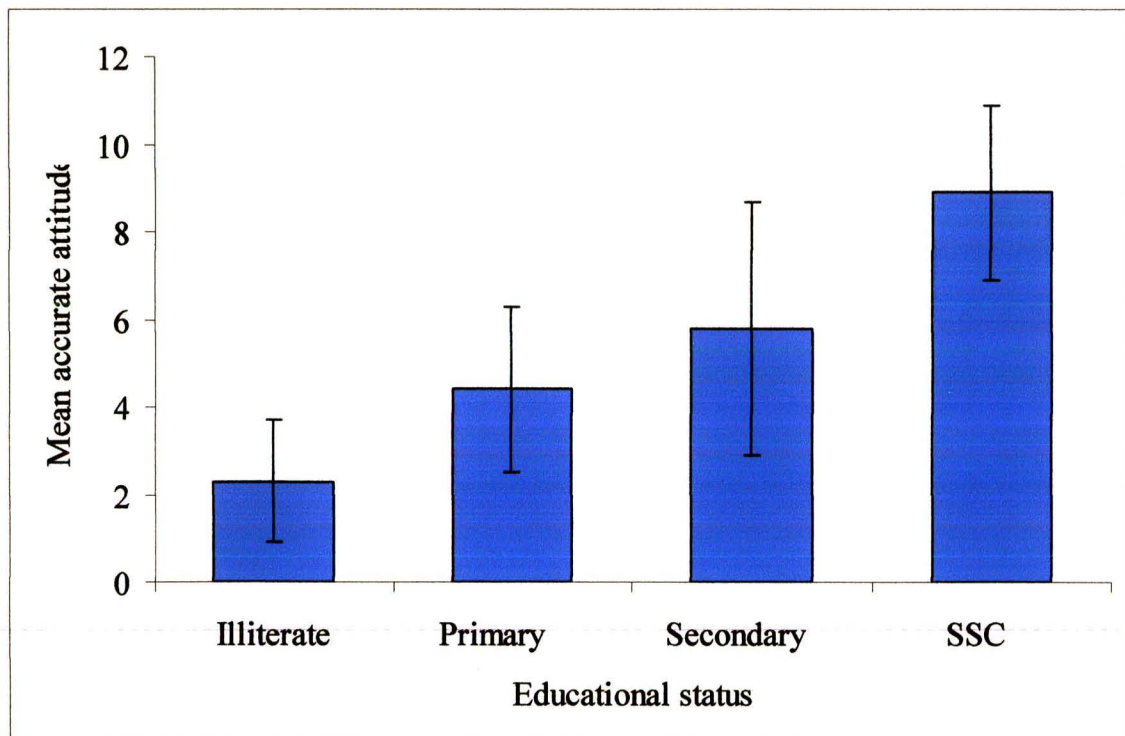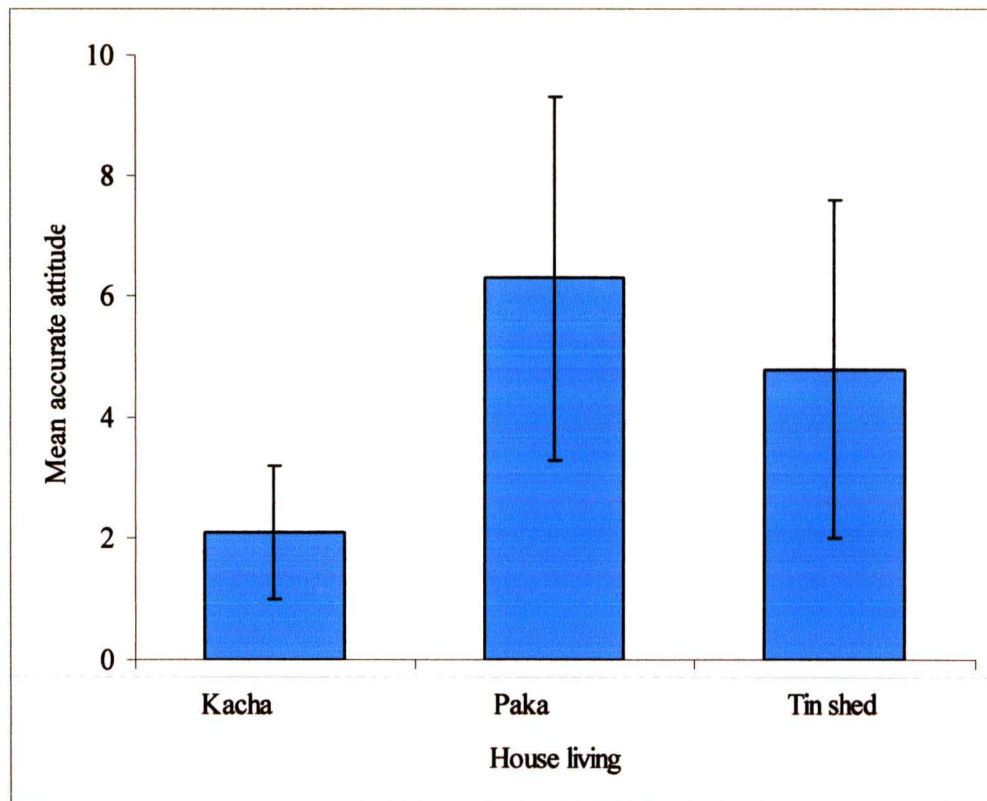

Figure 11: Bar diagram showing mean accurate attitude with house living

Table XVIII: Mean distribution of accurate attitude score according to respondent's number of children (n=300)

Number of children		Attitude		P value
	n	Mean±SD	min, max	
One	234	5.1±3.1	1-11	0.091[ns]
Two	66	5.8±2.4	3-8	

ns= not significant

P value reached from unpaired t-test

Regarding the association between number of children with attitude about nutrition status, the mean correct attitude was 5.1±3.1 in one children and 5.8±2.4 in two children. The mean accurate attitude regarding nutrition status was not significantly (p>0.05) associated with number of children.

Table XIX: Mean distribution of accurate attitude score according to respondent's religion (n=300)

Religion		Attitude		P value
	n	Mean±SD	min, max	
Muslim	274	5.2±3.1	1-11	0.267[ns]
Hinduism	26	4.5±2.7	1-8	

ns= not significant

P value reached from unpaired t-test

Regarding the association between religion with attitude about nutrition status, the mean correct attitude was 5.2±3.1 in Muslim and 4.5±2.7 in Hinduism. The mean accurate attitude regarding nutrition status was not significantly (p>0.05) associated with religion.

4.4 Nutritional practice

Table XX: Mean distribution of accurate practice score according to respondent's age (n=300)

Age (in years)		Practice		P value
	n	Mean±SD	min, max	
16-17	87	7.7±2.5	4-12	0.001[s]
18-19	213	13.0±4.7	4-21	

s= significant

P value reached from ANOVA test

Regarding the association between age with practice about nutrition status, the mean correct practice was 7.7±2.5 in age belonged to 16-17 years, and 13.0±4.6 in age belonged to 18-19 years. The mean accurate practice regarding nutrition status was significantly ($p<0.05$) higher in older group of the patients.

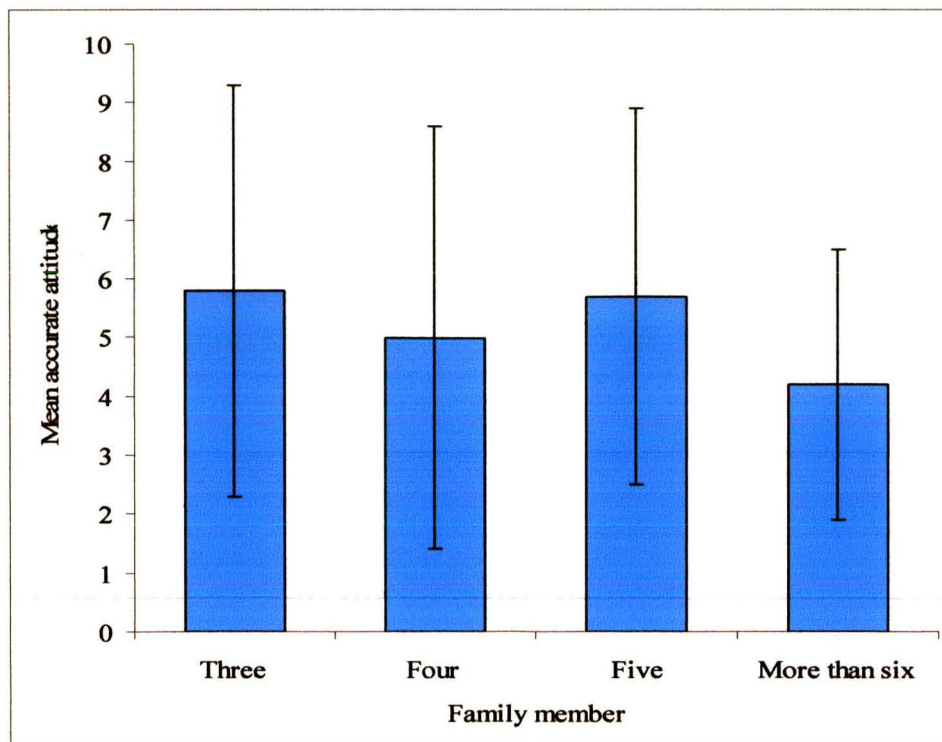**Figure 12: Bar diagram showing mean accurate practice with age.**

Table XXI: Mean distribution of accurate practice score according to respondent's occupational status (n=300)

Occupational status		Practice		P value
	n	Mean±SD	min, max	
Student	56	15.2±3.1	8-21	
House wife	179	9.5±2.8	4-15	0.001[s]
Household worker	41	8.3±1.5	6-11	
Others	24	9.9±0.7	9-11	

s= significant

P value reached from ANOVA test

Regarding the association between occupational status with practice about nutrition status, the mean accurate practice was 15.2±3.1 in student, 9.5±2.8 in housewives, 8.3±1.5 in household worker and 9.9±0.7 in other occupational status. The mean accurate practice regarding nutrition status was significantly (p<0.05) higher in student.

Figure 13: Bar diagram showing mean accurate practice with occupational status.

Table XXII: Mean distribution of accurate practice score according to respondent's educational status (n=300)

Educational status		Practice		P value
	n	Mean±SD	min, max	
Illiterate	68	7.7±1.6	6, 10	
Primary	109	9.0±2.5	4, 14	
Secondary	67	11.2±2.9	8, 19	0.001[s]
SSC	56	14.2±3.2	8, 21	

s= significant

P value reached from ANOVA test

Regarding the association between educational status with practice about nutrition status, the mean accurate practice was 7.7±1.6 in illiterate respondent, 9.0±2.5 in respondent who completed primary education, 11.2±2.9 in completed secondary education and 14.2±3.2 in completed SSC education. The mean accurate practice regarding nutrition status was significantly ($p<0.05$) higher in SSC educational status.

Figure 14: Bar diagram showing mean accurate practice with educational status.

Table XXIII: Mean distribution of accurate practice score according to respondent's monthly income (n=300)

Monthly income (Taka)	n	Practice		P value
		Mean±SD	min, max	
5000- 7000	98	8.4±2.0	5-12	
7000-10000	87	9.3±3.5	4-15	0.001[s]
> 10000	115	12.5±3.2	8-21	

s= significant

P value reached from ANOVA test

Regarding the association between monthly income with practice about nutrition status, the mean correct practice was 8.4±2.0 came 5000-7000 taka monthly income, 9.3±3.5 came from 7000-10000 monthly income and 12.5±3.2 came from >10000 monthly income. The mean accurate practice regarding nutrition status was significantly (p<0.05) higher in upper monthly income.

Figure 15: Bar diagram showing mean accurate practice with monthly income.

Table XXIV: Mean distribution of accurate practice score according to respondent's types of family (n=300)

Types of family	n	Practice		P value
		Mean±SD	min, max	
Nuclear	43	11.0±5.2	6-21	0.163^{ns}
Joint	257	10.2±3.1	4-19	

ns=not significant

P value reached from unpaired t-test

Regarding the association between types of family with practice about nutrition status, the mean correct practice was 11.0±5.2 in nuclear family and 10.2±3.1 in joint family. The mean accurate practice regarding nutrition status was not significantly (p>0.05) associated with type of family.

Table XXV: Mean distribution of accurate practice score according to respondent's family member (n=300)

Family member		Practice		P value
	n	Mean±SD	min, max	
Three	16	11.8±6.7	6-21	
Four	26	9.7±4.5	6-16	0.005[s]
Five	147	10.7±3.4	5-19	
More than six	111	9.4±2.3	4-13	

s= significant

P value reached from ANOVA test

Regarding the association between family members with practice about nutrition status, the mean correct practice was 11.8±6.7 in family member three, 9.7±4.5 in family member four, 10.7±3.4 in family member five and 9.4±2.3 in family member more than six. The mean accurate practice regarding nutrition status was significantly ($p<0.05$) higher in three family member.
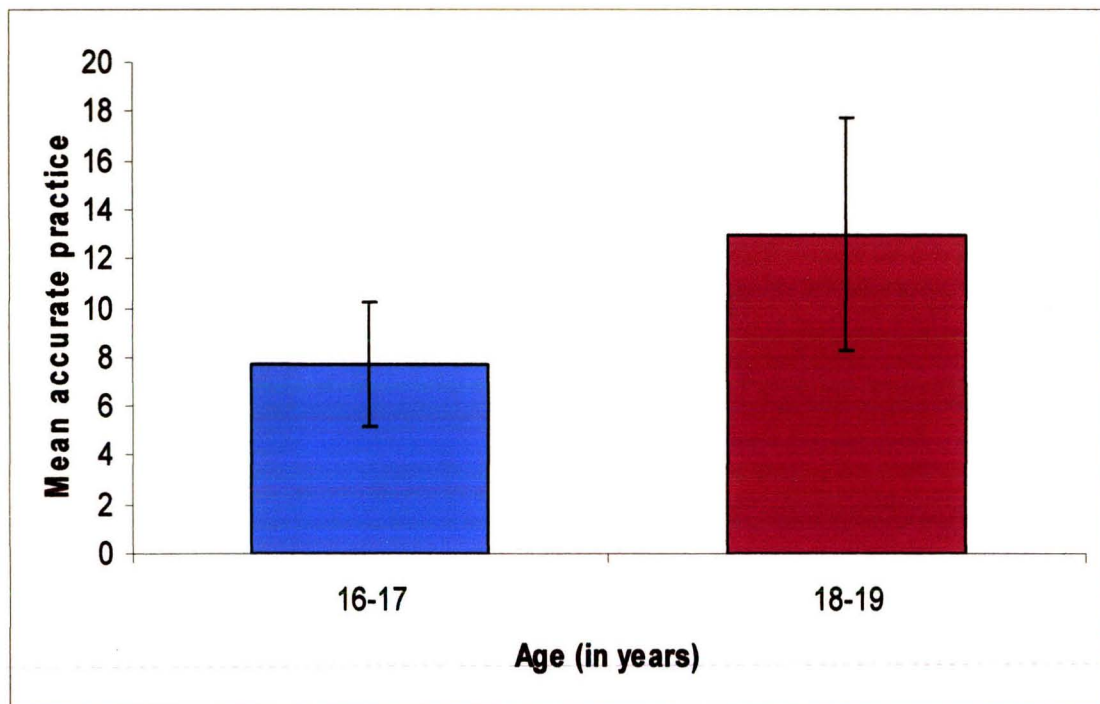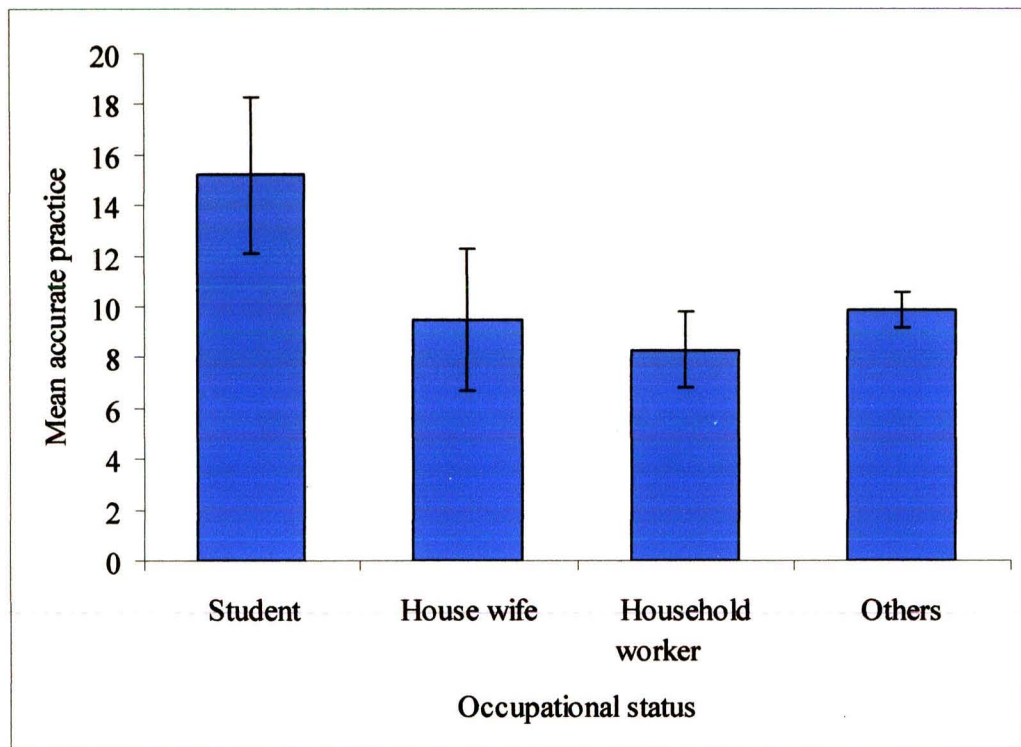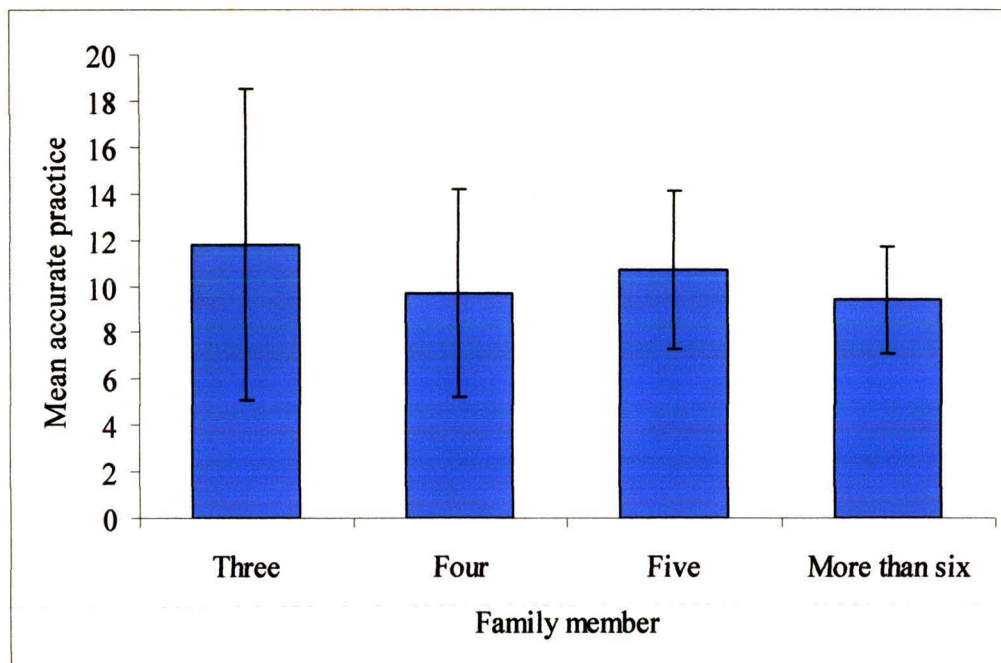

Figure 16: Bar diagram showing mean accurate practice with family member.

Table XXVI: Mean distribution of accurate practice score according to respondent's house living (n=300)

House living		Practice		P value
	n	Mean±SD	min, max	
Kacha	29	7.6±1.9	5-10	
Paka	119	11.2±3.8	4-21	0.001[s]
Tin shed	152	9.8±3.0	6-15	

s= significant

P value reached from ANOVA test

Regarding the association between house living with practice about nutrition status, the mean correct practice was 7.6±1.9 in kacha, 11.2±3.8 in paka and 9.8±3.0 in tin shed. The mean accurate practice regarding nutrition status was significantly (p<0.05) higher in house living paka.
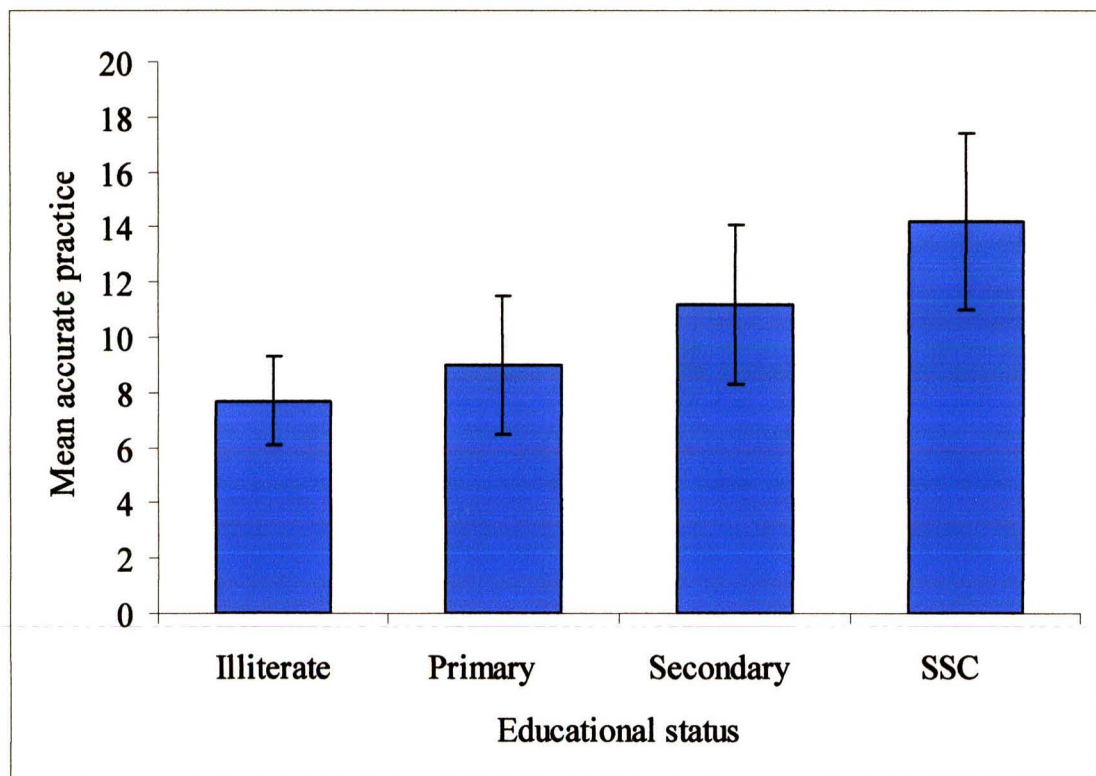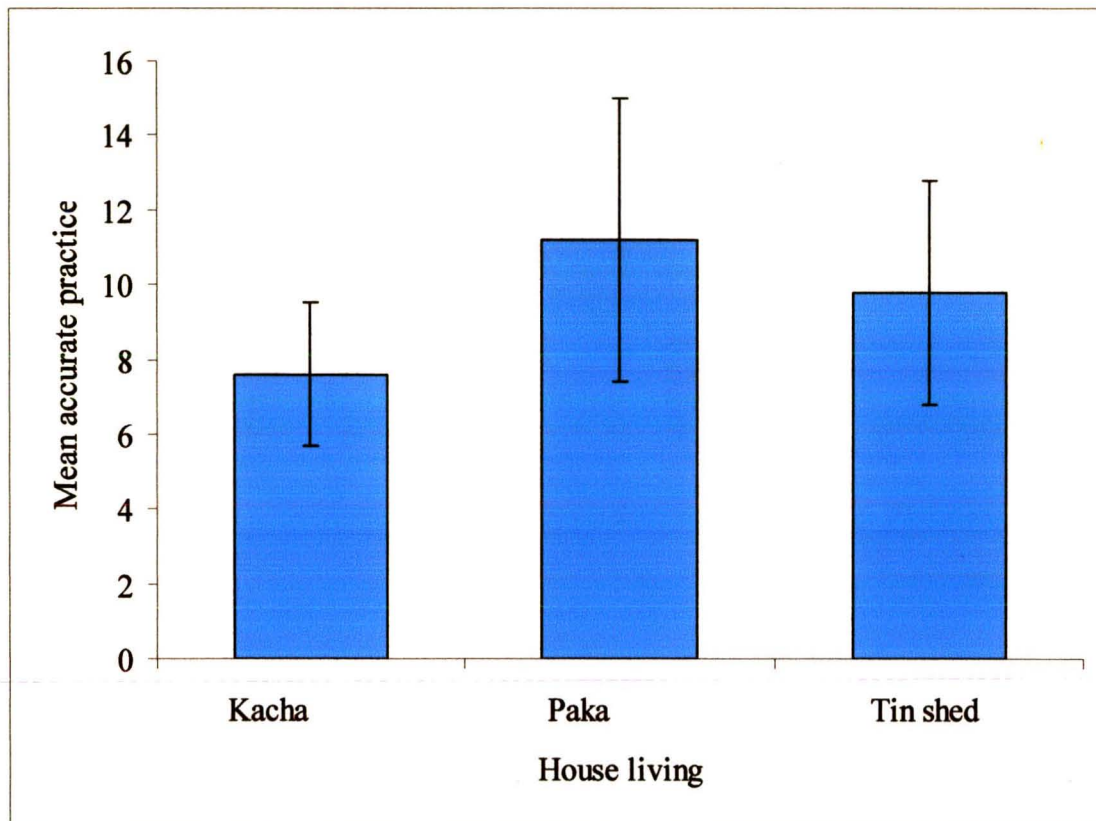

Figure 17: Bar diagram showing mean accurate practice with house living.

Table XXVII: Mean distribution of accurate practice score according to respondent's number of children (n=300)

Number of children		Practice		P value
	n	Mean±SD	min, max	
One	234	10.4±3.5	4-21	0.006[s]
Two	66	9.1±2.8	5-14	

s= significant

P value reached from unpaired t-test

Regarding the association between numbers of children with practice about nutrition status, the mean correct practice was 10.4±3.5 in one children and 9.1±2.8 in two children. The mean accurate practice regarding nutrition status was significantly (p<0.05) higher in one number of children.
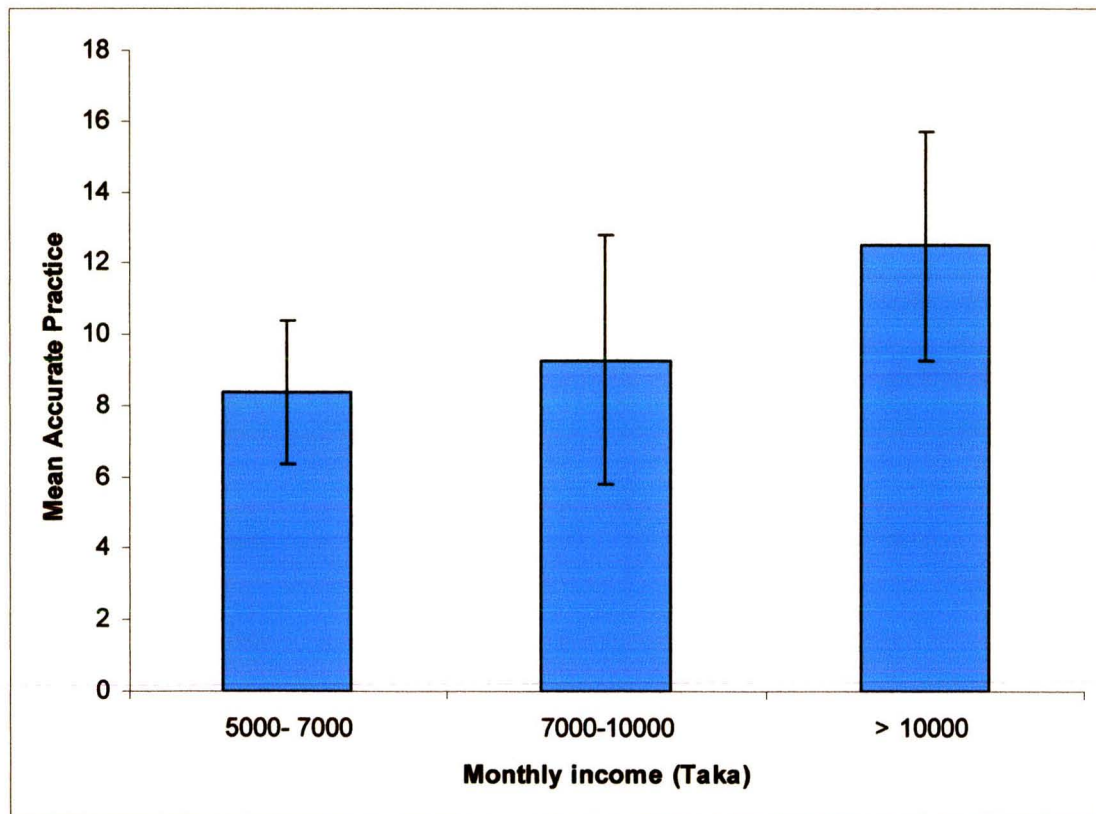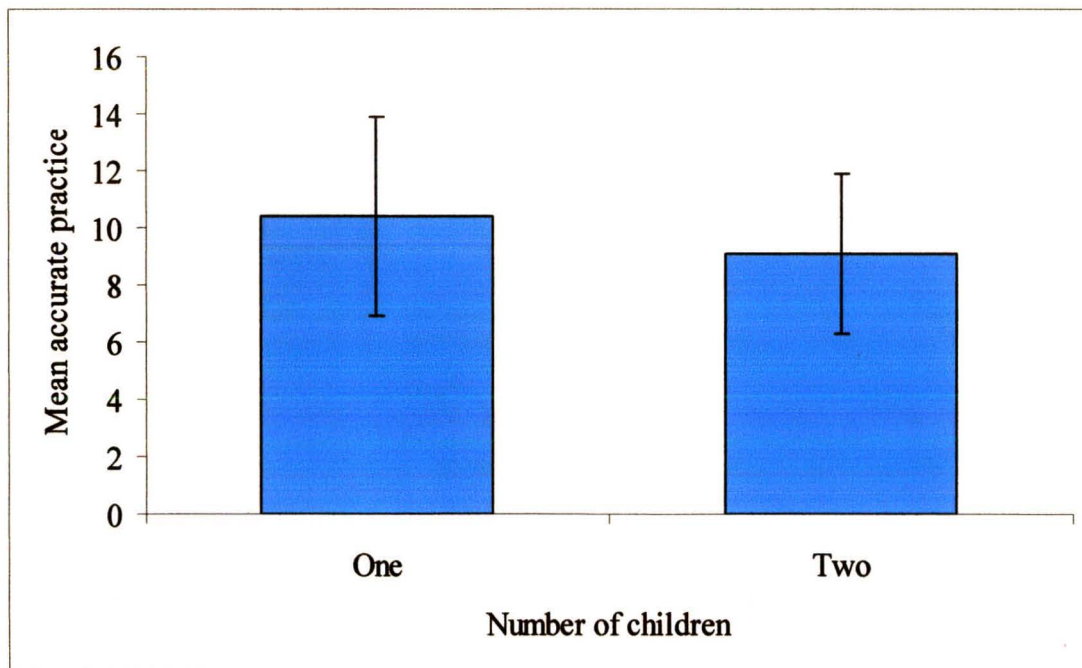

Figure 18: Bar diagram showing mean accurate practice with number of children.

Table XXVIII: Mean distribution of accurate practice score according to respondent's religion (n=300)

Religion		Practice		P value
	n	Mean±SD	min, max	
Muslim	274	10.4±3.5	4-21	0.049[s]
Hinduism	26	9.0±2.9	5-14	

s= significant

P value reached from unpaired t-test

Regarding the association between religion with practice about nutrition status, the mean correct practice was 10.4±3.5 in Muslim and 9.0±2.9 in Hinduism. The mean accurate practice regarding nutrition status was significantly (p<0.05) higher in Muslim.
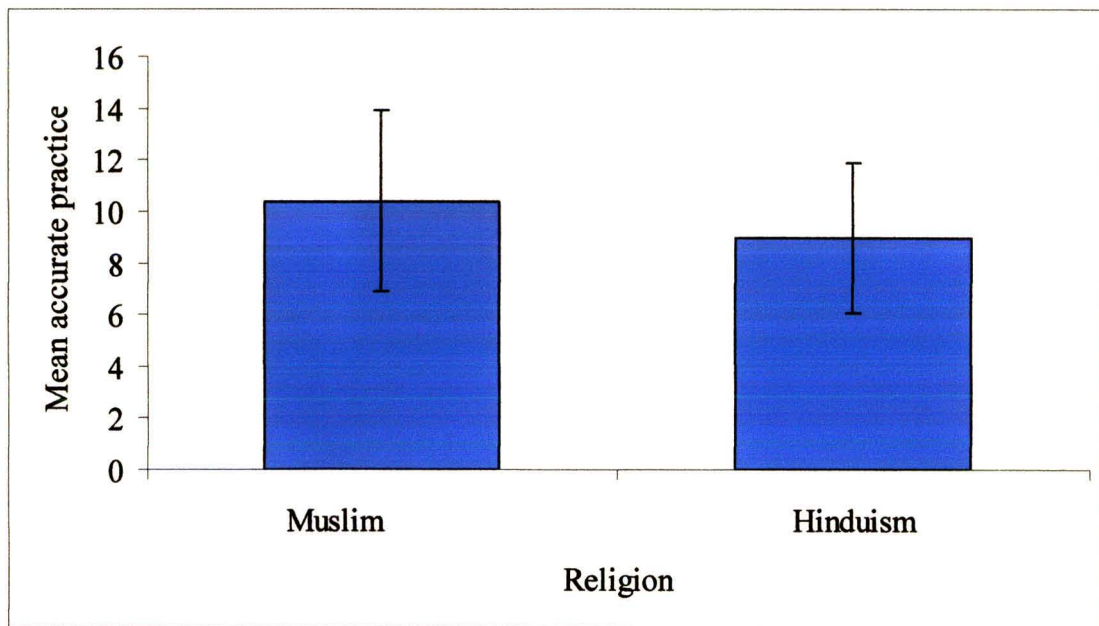
Figure 19: Bar diagram showing mean accurate practice with religion.

Table XXIX: Practice of The Respondents Regarding Nutrition (n=300)

	Good Practice (%)	Bad Practice (%)
Habit of taking major meals properly everyday	70.7	29.3
Practice of taking snacks between major meal	58	42
Practice of taking iron or folic acid rich food	24	76
Practice of washing vegs and foods before cutting	2.7	97.3
Practice of using iodized salt in cooking	68.7	31.3
Practice of cooking vegetables with oil	94	6
Practice of drinking safe water	77.3	22.7
Practice of using safe water in cooking	64.7	35.3
Practice of maintaining personal hygiene properly	44.7	55.3

4.5 Dietary Pattern of The Participants (Seven Days Recall Method)

FOOD INTAKE PATTERN

	FISH	MEAT	EGG	MILK	FRUITS	LENTILS	LEAFY VEG.	LIVER
< 4 TIMES/WEEK (%)	29.31	86.91	76.73	75.15	65.76	29.19	31.99	98.8
4-5 TIMES/WEEK (%)	25.87	11.99	18.77	14.95	18.43	37.46	29.71	1.2
6-7 TIMES/WEEK (%)	44.82	1.1	4.5	9.9	15.81	33.35	38.3	0
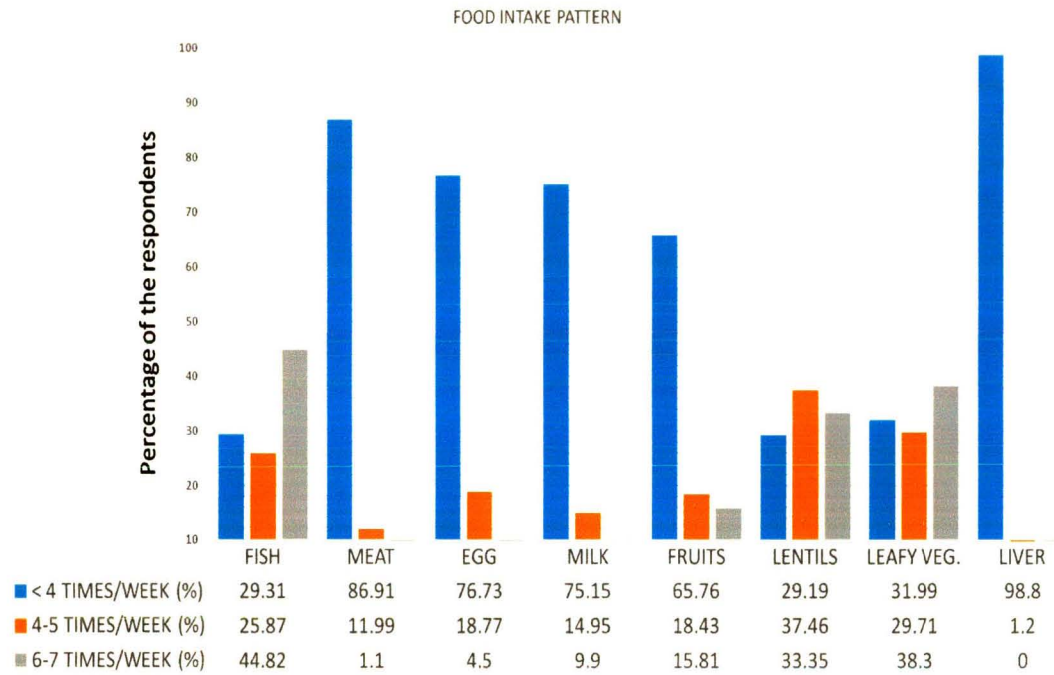
Figure 20: Bar diagram showing food intake pattern of the study populations.

Chapter 5

Discussion

DISCUSSION

Adolescence is one of the most challenging periods in human development. Because of the extent of physical and psychological changes taking place, a number of important issues arise that influence the nutritional wellbeing of the teenagers. Knowledge of developmental process is a prerequisite for understanding the nutritional aspect of life in this period.

This is a cross sectional type of descriptive study was carried out with an aim assess the anthropometric measurement by BMI of the respondents and assess the nutrition related knowledge, attitude & practice of the respondents and also to assess the dietary pattern of adolescent mothers in Bangladesh. A total of 300 adolescent mothers aged between 15-19 years from Kushtia Sador Upazila, Mirpur Upazila, Daulatpur Upazila, Bheramara Upazila under Kushtia district during July April, 2015 to October, 2015, were included in this study. The following observations and results were obtained in this study.

The World Health Organization defines adolescence as the period between the ages of 10 and 19 years, even though the end of adolescence is harder to define because it is determined more by psycho-sociological principles than by somatic, physical or biological changes (Telebak et al. 2013). In this current study it was observed that majority that is 213(71.0%) of the adolescents were aged 18-19 years and the rest 87(29.0%) were aged 16-17 years. The mean±SD age of the adolescents was 18.0±1.1 years. In another study Samarth et al. (2017) study found the mean age of adolescent population was 17.37±2.09 years, which is comparable with the current study.

In this study it was observed more than one third (36.7%) respondent had completed primary education, 114(38.0%) had monthly family income >10000 taka. Similarly, Begum et al. (2013) showed 38.8% had completed SSC education, followed by 29.1% up to class X, 17.5% HSC and 14.6% primary. More than a half (51.5%) came from high income family, followed by 34.0% medium income family and 14.6% low income family. [37]

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In this present study it was observed that almost half (49.3%) of the respondents had five numbers of family member and majority (91.3%) of the respondents came from Muslim family. Begum et al. (2013) showed 96.1% were Muslim and 1.9% were Hindu.58.8% family size belonged to 5-6 members, 37.3% belonged to 3-4 members and 3.9% belonged to 7 and above, which is comparable with the current study. [37]

Begum et al. (2013) obtained in their study that the mean height of the study when compare with the result of Nutrition Survey of Rural Bangladesh conducted by Institute of Nutrition & Food Science (INFS) shows that the height range that the height range of the adolescent mothers were121-150 cm, where as the height range of the present study is 142-170 cm. Regarding weight, the weight ranges of the girls are 29-81 Kg. Whereas, the weight range of the INFS study is 19.8-40.5 Kg. The finding of weight range of this study is far away from the INFS study. This situation is reflection of increased average income and more awareness about health and nutrition among the population of present study. [37]

The findings of Begum et al. (2013) study are nearer to the mothers of INFS study in its minimum value. "Nature and extent of Malnutrition in Bangladesh" a survey conducted by Bangladesh National Nutrition Survey 1995-96 found that BMI of the adolescent mothers (10-17 years) that 71.4% were normal weight, 25.1% underweight or thinness and 3.4% overweight. In the Begum et al. (2013) study showed 39.8% was underweight, 51.5% normal weight and 7.8% overweight, which is similar with the current study, where the present study, it was found that the more than half (53.3%) patients in 18.5-22.9 (Normal), 130(43.3%) in <18.5 (Under weight) and 10(3.4%) in 23-24.9 (Over weight). The mean BMI was found 18.8±1.9 kg/m2 with range from 15.1 to 24.8 kg/m^2. [37]

In this current study it was observed that, Mean Accurate Knowledge Regarding Nutrition was found significantly higher in older group of respondents, students, upper range of monthly income. Whereas it is lower in respondents who are illiterate, has larger family and it was found no significant relation to the religion.[40]
It was found that, Mean Accurate Attitude Regarding Nutrition was found significantly higher in older group of the respondents, in student- as educational status increases, higher in upper monthly income, higher in lower number of family member

and living in paka house. On the other hand, mean accurate attitude is not significantly associated with the respondent's type of family, their number of children and their religion.

Last but not the least, the mean accurate practice of the respondents regarding nutrition-

It was found significantly higher in older age group, who are student with SSC educational status, also higher in upper monthly income, living in paka house having small number of family members. In case of the mean accurate practice of the adolescent mothers, religious was a significant factor related to the practices.

In summary, age, occupational status, Educational status, Monthly income, Family member, House living were significantly associated with knowledge, attitude and practice as well as number of children and religion were significantly associated with practice only. On the other hand, only a type of family was not significantly associated with knowledge, attitude and practice but number of children and religion were not significantly associated with knowledge and attitude.

Hundera et al. (2015) study showed that 57.8% of lactating mothers had good nutritional knowledge while a significant proportion of the respondent, 42.2% of mothers had poor nutritional knowledge. Family size, family income and knowledge of foods that were significantly associated with the nutritional status of their study participants.[39]

In another study Kever et al. (2015) reveal that respondent had high (65.3%) knowledge of dietary practices and 63.27% of the respondents have positive attitude towards the practices.[41] Among the factors that impede good dietary practice in the population were cultural belief and poor socio-economic background while regular attendance of ante-natal clinic and good socio economic background enhance good dietary practice among the population. There were no association between age and knowledge, attitude and religious affiliation; however occupation and the attitude of the respondent were statistically significant. Therefore there is evidence to suggest that occupation of the population has influence on the attitudes of pregnant women towards dietary practices.

Ahadi et al. (2014) observed that there are significantly positive correlations among nutrition knowledge, attitude and practice; and attitude has stronger association with practice than knowledge does. [36]

In our country from rural area of Bangladesh Begum et al. (2013) obtained in their study that significant relationship was found between family income and total calorie intake. A good number of adolescent from the families (income >50,000/= per month) takes calorie according to RDA (60.4%). [37]

The practices of pregnant mothers about maternal nutrition were relatively low in Daba et al. (2013) study. Information about nutrition and family size of mothers had a positive significant relation with mothers' nutrition practices in their study area. The most significant predictor for good nutritional practices was information about nutrition, women occupation and family size. [38]

Mirsanjari et al. (2012) found there was significant positive but not strong correlation between nutrition knowledge and practices (r= 0.152, p<0.05), knowledge and attitude (r= 0.154, p<0.05) and attitude and practice (r=0.147, p<0.05).

Regarding the food intake pattern it was observed in this study that most of the participant eat liver (98.8%) followed by meat (86.91%), egg (76.73%), milk (75.15%), fruits (65.76%), leafy vegetable (31.99%), fish (29.31%) and lentils (29.19%) less than 4 times per week.

Johnson et al. (1994) study found that about 40% of the girls does not eat meat, 33% does not take milk and 24% doesn't take egg per week. In Begum et al. (2013) study found about 1%, 26%, 23% doesn't take meat, milk and egg respectively per week. But the meat intake frequency (per week) is good (Johnson et al. 1994). The present study also revealed relation between family size and monthly family income with nutritional status.

Hence, the government in collaboration with concerned bodies should focus on nutritional education and information about nutrition to increase the practices of pregnant mothers on maternal nutrition during pregnancy in the study area.

Chapter 6
Conclusion

6.1 Conclusion

Normal nutritional needs remain throughout the life. Good nutrition generally can improve the spirit and quality of life, can speed recovery from illness and prolong life. Teenage is a unique interventions point of life cycle. [42] It is a stage of new ideas and a point at which lifestyle choices may determine an individual's life course. Although teenagers are well informed about nutrition and good eating practices, this knowledge is often not translated into their daily lives.[43] The present study reveals that of adolescent age group have knowledge regarding nutrition but they are not well informed nutritional needs for maintaining good health. They are also not much aware of health effects and consequences of unhealthy eating practices.[44] Therefore, there is a need for nutritional intervention programs for teenagers. Educating the teenagers on nutrition and health aspects will go a long way to lead a better life.[45]

6.2 Recommendation

Educating the adolescent mothers on nutrition and health aspects will go a long way to lead a better life. Present KAP study data are essential to help plan, implement and evaluate nutritional planning & intervention work. This KAP survey gathers information about what respondents know about adolescent mother's nutritional status, what they think about the health system and what they actually do with regard to seeking care or taking other action. [46]This study can identify knowledge gaps, cultural beliefs, or behavioral patterns that may facilitate understanding and action.

Nutritional status of the adolescent mothers was not so satisfactory. Basic knowledge of nutrition of the mothers is poor.[47] Community-based adolescent-friendly health and nutrition education and services and economic development may improve the overall health and nutritional knowledge and status of adolescent mothers. Adolescence is a critical time for young women, building the foundation for successful reproduction and a healthy adulthood and later life. Young women must enter adulthood with good nutritional stores to remain strong and healthy throughout their child-bearing years and into old age.

6.3 Limitations

- ❑ The study population was selected from one selected rural area of Bangladesh, so the results of the study may not reflect the exact picture of the whole country. Small sample size was also a limitation of the present study. Therefore, in further study, these objectives could be under taken with large sample size.

- ❑ According to sample size calculation, the minimum sample size was 384 but due to the unavailability of sufficient respondents, the study was conducted with 300 total respondents.

- ❑ The cross sectional analysis of monthly income and nutritional status, and dietary intake pattern could not be conducted due to lack of fund and time. Also, this objective requires extensive food intake data, mostly quantitative data of food intake by each respondent.

- ❑ This study could also be conducted in urban area and make comparison of both of the results, which could lead to more accurate nutritional status of adolescent mothers.

Chapter 7
Annexure

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7.2 Questionnaire

A STUDY ON NUTRITIONAL STATUS AND RELATED KAP (KNOWLEDGE, ATTITUDE, PRACTICE) OF ADOLESCENT MOTHERS IN A SELECTED AREA OF BANGLADESH

Section-1: Personal information:

Name:	ID:
Father's name/ Husband's name:	Date:
Permanent address:	Age:
Name of the place or visit:	

Section-2: Socio Economic Information:

Variable no.	Question		Answer code
V1	What is your occupation that is the kind of work does you mainly doing?	Student=1 House wife=2 Household worker=3 Others=4	
V2	Education completed-	Primary = 1 Secondary = 2 S.S.C = 3 None = 4	
V3	Total family income in the last month	> 5000 BDT = 1 (5000- 7000) BDT = 2 (7000-10000) BDT = 3 > 10,000 BDT = 4	
V4	Types of family:	Nuclear=1 Joint=2	
V5	Total family member	Three = 1 Four = 2 More than four =3 More than six = 4 More than eight = 5	
V6	What type of house you are living?	Kacha = 1 Paka = 2 Tin shed = 3	
V7	Number of children	One = 1 Two = 2 Three =3	
V8	What is your religion?	Islam=1 Hinduism=2 Christianity=3 Buddhism=4	

Section-3: Anthropometry:		
V9	Height(cm)	
V10	Weight(kg)	
V11	Body Mass Index (BMI)	

Section 4: Nutrition Related Knowledge, Attitude and Practice (KAP)			
Section 4.1: Knowledge			
Variable No.	**Question**		**Answer Code**
V12	Do you have knowledge about "Nutrition"?	Yes = 1 No =2 Not sure =3	
V13	If yes mention them	Processed which nourishes the body=1	
V14	Do you know about nutrient components?	Yes = 1 No =2 Not sure =3	
V15	If yes mention them	CHO, Pro,Fat,Vit, Min,Water=1	
V16	Do you know about the functions of foods in our body?	Yes = 1 No =2 Not sure =3	
V17	If yes mention them	Growth of human body=1 Protect from illness=2 Give energy=3	
V18	Do you know the source of energy rich foods?	Yes=1 No=2 Not sure =3	
V19	If yes then, name of energy rich foods	CHO rich foods=1 Fat rich foods=2 both=3	
V20	Do you know the source of some Carbohydrate rich foods?	Yes = 1 No = 2 Not sure =3	
V21	If yes then, name of some Carbohydrate rich foods	Rice,rice kanji,ruti=1 Chira, Khoi=2 Potato=3	
V22	Do you know the source of Protein rich foods?	Yes = 1 No = 2 Not sure =3	
V23	If yes mention them	Fish,meat,egg=1 milk product=2 pulses, bean=3	
V24	Knowledge about importance of Protein -	Yes = 1 No = 2	

Variable No.	Question		Answer Code
		Not sure =3	
V25	If yes mention them	growth of body=1 building body cell=2 repair damages cells=3	
V26	Do you know the fat rich foods?	Yes = 1 No = 2 Not sure =3	
V27	If yes mention them	Oil=1 animal fat=2 butter, ghee=3	
V28	Do you know the source of some vitamins and minerals rich foods?	Yes = 1 No = 2 Not sure =3	
V29	If yes then, name of some vitamin and minerals rich foods	Fruits=1 veg=2 Animal source (egg,milk)=3	
V30	Do you know the source of some Vit. A rich foods?	Yes = 1 No = 2 Not sure =3	
V31	If yes mention it	papaya, banana, mango=1 red pumpkin, carrot=2	

Section 4: Nutrition Related Knowledge, Attitude and Practice (KAP)			
Section 4.1: Knowledge			
Variable No.	Question		Answer Code
V32	Consequences of Vit A deficiency disorder -	Yes = 1 No = 2 Not sure =3	
V33	If yes mention it	Night blindness=1 Bitot's spot=2	
V34	Do you know the source of some Iron rich foods?	Yes = 1 No = 2 Not sure =3	
V35	If yes mention it	dark leafy veg=1 liver, meat=2 others=3	
V36	Consequences of Iron deficiency disorder -	Yes = 1 No = 2 Not sure =3	
V37	If yes mention it	Anemia=1	
V38	Do know the importance of sour fruits in Iron absorption?	Yes = 1 No = 2 Not sure =3	

Variable No.	Question		Answer Code
V39	Do you know the source of some Folic acid rich foods?	Yes = 1 No = 2 Not sure =3	
V40	If yes mention it	Green leafy veg=1 Beans = 2 cereals=3	
V41	Do you know the source of some Calcium rich foods?	Yes = 1 No = 2 Not sure =3	
V42	If yes mention it	Milk & milk products=1	
V43	Knowledge about source of Iodine-	Yes = 1 No = 2 Not sure =3	
V44	If yes mention it	Iodized salt=1 Sea food=2	
V45	During pregnancy mother needs increase amount of food?	Yes = 1 No = 2 Not sure =3	
V46	During Lactation mother needs increase amount of foods than pregnancy?	Yes = 1 No = 2 Not sure =3	
V47	Knowledge about consequences of malnutrition in adolescent motherhood?	Yes = 1 No = 2 Not sure =3	
V48	If yes mention it	Anaemia=1 Increases of disease frequency=2 Weight loss=3 Decrease of immunity power=4	
V49	Which is the main source of drinking water?	Tube well=1 Boiled water=2 Wrong ans=3	
V50	Knowledge about washing vegetables-	before cutting=1 after cutting=2=wrong ans Not sure=3	
V51	Do you know Oil is important for fat soluble Vitamins during cooking?	Yes = 1 No = 2 Not sure =3	

Section 4: Nutrition Related Knowledge, Attitude and Practice (KAP)			
Section 4.2: Attitude			
Variable No.	**Question**		**Answer Code**
V52	Nutrition is very important for all ages	Agree = 1 Disagree=2 Not sure=3	
V53	Foods are source of nutrition	Agree = 1 Disagree=2 Not sure=3	
V54	Anaemia is the results of intake less amount of Iron & folic acid rich foods	Agree = 1 Disagree=2 Not sure=3	
V55	Vit C helps to absorb Iron in our body	Agree = 1 Disagree=2 Not sure=3	
V56	In adolescent period nutrients requirement is highly important	Agree = 1 Disagree=2 Not sure=3	
V57	Good diet practice is important for mothers & infant	Agree = 1 Disagree=2 Not sure=3	
V58	Lack of proper nutrition turns to severe malnutrition in adolescent motherhood	Agree = 1 Disagree=2 Not sure=3	
V59	Food taboos can be cause of malnutrition	Agree = 1 Disagree=2 Not sure=3	
V60	Vegetables & fruits should be washed before cutting	Agree = 1 Disagree=2 Not sure=3	
V61	Iodized salt is good for health	Agree = 1 Disagree=2 Not sure=3	
V62	Hygiene protects form food contamination	Agree = 1 Disagree=2 Not sure=3	

Section 4: Nutrition Related Knowledge, Attitude and Practice (KAP)			
Section 4.3: Practice			
V63	Do you take 3 major meals every day?	yes=1 no=2	
V64	If no then which major meals you skip most	Breakfast=1 Lunch=2 Dinner=3	
V65	Do you intake small snacks between major meals?	yes=1 no=2	

Variable No.	Question		Answer Code
V66	If yes what type of snacks you intake most?	Fruits=1 Milk & milk products=2 Chira/ muri/ khoi/ biscuts=3 Street food=4 Homemade snacks=5 Others=6	
V67	Type of CHO intake most	Whole grains=1 Cereals=2 Tubers=3 Roots=4	
V68	Type of Protein intake most	Fish=1 Egg=2 Dal=3 Meat=4 Milk & milk product=5	
V69	Type of vegetables intake most	Leafy vegetables=1 Tubers & roots vegetables=2 Plant vegetables =3 Legumes=4	
V70	Intake of Iron & folic acid supplement	yes=1 no=2	
V71	When do you wash vegetables?	Before cutting=1 After cutting=2	
V72	Which salt do used for cooking?	Iodized salt=1 Others salt=2	
V73	Do you cooked vegetables with oil?	yes=1 no=2	
V74	Which water do you used for drinking?	Tube well=1 Supply water=2 Boiled water=3 Pond/river=4 others=4	
V75	Which water do you used for cooking?	Tube well=1 Supply water=2 Pond/river=3 others=4	
V76	Do you maintain personal hygiene properly?	Yes=1 Sometime skip=2 Not properly=3	
V77	Do you have any misconception about foods?	Yes=1 No=2	
V78	If yes which one	Tamarind=1 Fish=2 Beef=3	

Section-5: Food frequency questionnaire (7 days):		
Variable no.	Question	Answer code
V12	How many times in the last 7 days you have consumed the following items? Not taken=0　　1 time=1　　　2 times=2　　3 times=3 4 times= 4　　5 times= 5　　6 times= 6　　7 times=7	
	a.　Fish	
	b.　Meat	
	c.　Egg	
	d.　Milk	
	e.　Fruits	
	f.　Lentils	
	g.　Leafy Vegetables	