

# A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention and Prevalence of Anemia among Adolescent Girls in Selected Areas

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## ABSTRACT

**Statement of problem:** “A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention and Prevalence of Anemia among Adolescent Girls in A Selected areas.”

**Material and Methods:** In the present study one group pre test and post test experimental descriptive research design is used to collect the sample from selected areas of Mohali of 100 adolescent girls. The sample is collected through purposive sampling technique. The data is collected by socio demographic questionnaire and self-instructional module.

**Result:** Majority 58 (58%) of the adolescent girls had inadequate knowledge, 40 (40%) had moderate knowledge and 02 (2%) had adequate knowledge in pre-test before administering structured teaching program. After getting structured teaching program, 15 (15%) of adolescent girls had moderate knowledge and 85 (85%) of adolescent girls had reported adequate knowledge. It is significantly shows that there is association between knowledge levels of adolescent girls regarding prevention and prevalence of anemia and demographic variables.

**Conclusion:** It was concluded that there is gain in knowledge after teaching program and there is significant association between level of knowledge and demographic variables.

**KEYWORDS:** Anaemia, Adolescent Girls

## 1. INTRODUCTION

“Iron deficiency can lead to a wardrobe full of clumped clothes.”

-Benny Bellamacina

Anemia is a condition in which the number of red blood cells or the amount of hemoglobin is low. Red blood cells contain hemoglobin protein that it enables them to carry oxygen from the lungs and deliver it to all parts of the body. When the number of red blood cells is reduced or the amount of hemoglobin in them is low, the blood cannot carry an adequate supply of oxygen. An inadequate supply of oxygen in the tissues produces the symptoms of anemia (Gupta and Kochar, 2009). Adolescence has been defined by the world health organization as the period of life

spanning the ages between 10 to 19 years (WHO, 2017). This is the formative period of life when the maximum amount of physical, psychological, and behavioral changes take place. That is a vulnerable period in the human life cycle for the development of nutritional anemia, which has been constantly neglected by public health programmers. During adolescence, (i.e., 10-24 years of age), anemia is estimated to be the greatest nutritional problem. Anemia in adolescents and young adults can have negative effects on their cognitive performance and growth. At all levels, the negative effects of anemia during adolescence justify public health action; unfortunately, because initiatives to prevent anemia commonly target infants, young children and

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pregnant and lactating women, and not necessarily adolescents the needs of adolescents may remain unmet, and the consequences of anemia in adolescents. Iron – deficiency anemia is a serious public – health concern in most developing countries. Iron deficiency anemia is estimated to cause 591,000 prenatal deaths and 115,000 maternal deaths globally (Meier et al., 2003). Prevalence of anemia in South Asia is among the highest in the world, mirroring overall high rates of malnutrition (Steven and Abrams, 2008). Anemia remains a major cause of mortality and morbidity in developing countries where resources to determine the underlying etiology remain poor. Adolescents are young people between the ages of 10 and 19 years [1].

More than 1.2 billion adolescents are found in the world. The vast majority of adolescents (90%) live in low- or middle-income countries (LMICs) [2]. Adolescents and children constitute about 48% of the Ethiopian population, and about 25% of this age group is girls [3]. It is a period of rapid growth when up to 45% of skeletal growth takes place and 15 to 25% of adult height is achieved during this period [4]. During the growth spurt of adolescence, up to 37% of total bone mass may be accumulated. Although, nutrition influences growth and development throughout infancy, childhood, and adolescence, pieces of evidence show that nutrient needs including that of iron are the greatest during the period of adolescence [4].

Anaemia, defined as a low blood haemoglobin concentration, is a public health problem that affects LMICs and has significant adverse health consequences including morbidity and mortality as well as adverse impacts on social and economic development [5]. Iron deficiency is the most prevalent nutritional deficiency and the most common cause of anaemia in the world. It is characterized by a defect in haemoglobin synthesis, resulting in red blood cells that are abnormally small (microcytic) and a decreased amount of haemoglobin (hypochromic). Asia and Africa are regions with a higher prevalence of anaemia. Nutritional deficiencies are regarded as the most important cause of anaemia in the world and a major potential contributor to adolescent anaemia in sub-Saharan Africa [6].

WHO defines anaemia as a condition in which haemoglobin (Hb) content of blood is lower than normal as a result of deficiency of one or more essential nutrients. Based on WHO 2011, if the haemoglobin level is  $\geq 12$  g/dl, it does not indicate anaemia for males and females of age between 12 and 14 years and for nonpregnant women  $>15$  years.

Anaemia is established if the level of haemoglobin is  $<12$  g/dl for nonpregnant women

$>15$  years and children 12–14 years old and 11–11.9 g/dl, 8–10.9 g/dl, and 8 mg/dl were consider as having mild, moderate, and severe anaemia respectively [7]. Based on the public health importance, if the prevalence of anaemia  $\leq 4.9\%$  is no public health problem, 5.0–19.9% mild public health problem, 20.0–39.9 moderate public health problem, and  $\geq 40$  severe health problem [8].

The WHO estimates the prevalence of anaemia among adolescent girls in southwest Asian countries like Indonesia, Nepal, and Bhutan was 30%, 46%, and 58.6%, respectively [9]. Similarly, in sub-Saharan Africa, about half of adolescent girls are anaemic [5]. Local studies in Babile, eastern Ethiopia, were 32%, and this study concluded the nutritional status of adolescent girls contributes to the nutritional status of the community [10]. Another study conducted in the Afar region, Ethiopia, shows that the prevalence of anaemia among school-going adolescent girls was 22.9%, and it was a moderate public health problem [11].

Globally, the prevalence of anaemia had shown dramatic increment among women of nonpregnant reproductive age groups from 464 million in 2000 to 578 million in 2016. A condition persists in LMICs which reported the overall prevalence of anaemia was over 35%. So, there is still a long road ahead to achieve the SDG 2030 targets anaemia in adolescent girls. In Ethiopia, eighteen percent (17.7%) nonpregnant women aged 15 to 49 are anaemic, of which Somali regional state has the highest prevalence of anaemia (34.8%) followed by the Gambella region where 26.7% and 19% of reproductive age nonpregnant women were anaemic in Oromia regional state [12, 13].

The associated factors of anaemia among adolescent girls differ from study to study, like low dietary diversity score, living status of adolescents with either of the two parents, duration of menstruation, history of parasitic infestation, low socioeconomic status, household family size, inadequacy of dietary iron intake, drinking tea immediately after a meal, high consumption of whole wheat bread, and low consumption of vitamin C rich foods and molasses, parent's level of education, parasite infections, low BMI, being stunted, and underweight [10, 11, 14, 15].

The risk of anaemia increases during adolescent years with the onset of menstruation and pregnancy. Iron loss from menstruation must be countered by further high iron intake for young women; the other is ever-increasing evidence that control anaemia in pregnant

women may be more easily achieved if satisfactory iron status can be ensured during adolescence [6, 16]. Most of the previous studies on anaemia in Ethiopia were conducted on pregnant and lactating women and children. A few studies assessed anaemia and its predictors among adolescent girls in the country. Some of the reasons why there are few studies done in this age groups are they are assumed as being less vulnerable to nutritional deficiency than the other groups which are not true, given the fact that adolescence exerts significantly increased demands on both micro- and macronutrients due to the rapid changes occurring in physical as well as in body composition particularly among ladies experiencing their menarche. So, this study aimed to assess the prevalence and factors associated with anaemia among school adolescent girls in Jimma town secondary schools. Micronutrient deficiency resulting in disorders such as anaemia commonly affects adolescents in developing countries. Around one-quarter of adolescents in developing countries are anaemic [1], but prevalence estimates for adolescent anaemia in the South-East Asia region range from 27% to 55% [2]. Adolescents' vulnerability to anaemia is commonly attributed to the biological demands for micronutrients (such as iron and folic acid) associated with rapid physical growth, as well as from loss of these micronutrients due to parasitic infestations like malaria and hookworm [3]. At the end of adolescence, male rapidly regain adequate nutrient stores, whereas female remain vulnerable to anaemia as a result of menstrual blood loss. They may therefore continue to be anaemic or become more anaemic because of increased micronutrient requirements from menstruation as well as from pregnancy and lactation [4].

Anaemia not only adversely affects adolescents' physical growth, but it also hinders them achieving their full potential by diminishing educational achievement and labour productivity [2]. Previous research has shown adverse effects of anaemia on adolescents' cognitive function and mental health, as well as lower school attendance, learning, academic achievements and decreased work performance [5–8]. In pregnant girls, anaemia increases the risk for birth complications and delivery of low birth-weight infants. Hence, anaemia is not only a concern for today's adolescents, but also for society's future development [9].

In the context of LMICs including Nepal, there is scarce evidence on micronutrient deficiencies among adolescents and in particular, around anaemia in adolescents [10]. The Nepal Demographic and Health Survey (NDHS) is a primary source of national data

on anaemia, but it explicitly provides information on only mothers and children under-five years old. According to the NDHS 2011, 46% of children aged 6–59 months, and 35% of women aged 15–49 years were anaemic [11]. Although there has been a substantial reduction of anaemia among women in Nepal between 2001 and 2006, but improvements have stagnated since 2006. Several small-scale studies have attempted to examine the prevalence of anaemia in adolescents with alarming results. For example, a survey of 308 adolescents aged 10 to 19 years from the Morang district in Nepal showed an overall prevalence of adolescent anaemia of 66% [12]. Hospital-based studies conducted among 10 to 19 year old adolescents showed an overall prevalence of 52% - 56% [13, 14]. However, these small studies were each limited to a local region. We designed the current study to determine the prevalence of adolescent anaemia and its correlates within a larger nationally representative sample (n = 3780) of 10 to 19 year olds in Nepal.

### NEED OF THE STUDY

Anemia is one of the most universally prevalent diseases in the world today. Iron deficiency anemia is the most common micronutrient deficiency. WHO studies show higher rate in developing countries. The iron deficiency anemia is common 52 % of pregnant women and about 35-40% of non-pregnant women.<sup>1</sup>

Anemia is caused by inadequate supply of dietary iron is the most prevalent nutritional disorder in the United States and the most common mineral disturbances. Almost 16% of lower income children are anemic.<sup>2</sup>

Nutritional anemia is one of India's major public health problems. The prevalence of anemia ranges from 33% to 89% among pregnant women and is more than 60% among adolescent girls.<sup>3</sup>

Anemia is generally recognized as the greatest nutritional problems among adolescents and diet is likely a major factor. In a review of 32 studies from developing countries the overall prevalence of anemia was the order of 27%. In the International Center for Research on Women studies rates ranged from 16%-55% in India. The International Nutritional Anemia Consultation group estimates 46% of the world's children belong to 5-14 years are anemic. Majority of this anemia is occurring in individuals from the developing world as discussed in a recent study.<sup>4</sup>

Majority of the adolescents think that they are in good health and show little concern for protecting their health. Main nutritional problems of adolescents are micronutrient deficiencies like iron deficiency, foliate and vit. A<sup>5</sup>. The prevalence of anemia was 68.8%



and associated with diet consumed, passage of worms and menarche status in 209 healthy girls of 11-18 years in the Government girls' high school of Nepal.<sup>6</sup>

Dietary inadequacies are likely more of threat among adolescents because of erratic eating patterns and specific psycho social factors underlying these combined with the particularly high nutritional requirements for rapid growth. Anemia in adolescent girls poses a great health hazard. Their physical, mental, emotional and social development takes the prominence during their period of time. The lowered hemoglobin status hampers and stunts this growth associated with developments. If they conceive during these years with anemia, they may produce babies with average to poor health.<sup>2</sup>

Awareness to adolescence is a matter of fact to be considered due to their negligence. To have healthy women and mothers, one needs to be strong and healthy. The health education given to them will give them the insight to practice healthy life styles and there by prevent anemia.

Adolescence is a period of peak growth for boys and girls. Nutritional requirements in relation to body size are more during adolescence. In a country like India with varying social customs and common beliefs against females, there is a high prevalence of malnutrition and anemia among girls. The increased aptitude on slimming and physical beauty conscious has made the girls more vulnerable to anemia.

### Problem Statement

A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Prevention and Prevalence of Anemia among Adolescent Girls in A Selected areas Mohali Punjab.

### Objectives of the Study

1. To assess the pre-test regarding anaemia among the adolescent girls.
2. To provide booklets and video regarding the prevention of anaemia among the adolescent girls.
3. To assess the post-test knowledge.
4. To determine the improvement of knowledge on anaemia among adolescent girls
5. To compare pre-test and post-test knowledge regarding anaemia in adolescent girls.
6. To find out association between knowledge regarding anaemia with selected demographic variables.

### Operational Definitions

**Assess:** - It is the organized systematic & continuous process of collecting information about pre-test &

post-test knowledge from adolescent girls regarding Anaemia.

**Effectiveness-** It implies to produce a desire effect for an action.

**Structured teaching programme-** Refers to the systematically structured teaching programme designed to provide Information regarding prevention and prevalence of anaemia.

**Knowledge-** It refers to correct response of adolescent girls to knowledge items on prevention and prevalence of anaemia.

**Prevalence:** - It refers to the fact or condition of being prevalent commonness.

**Prevention:** - It refers to the action of stopping from happening anemia.

**Anemia:** - It refers to a decrease in the concentration of circulating red blood cells or in the hemoglobin concentration and a transport oxygen.

### Hypotheses

**H1-** There will be significant difference between the mean pre-test and post-test knowledge regarding Prevention and Prevalence of Anemia among the adolescent girls receiving Structured Teaching Program (STP).

**H2-** There will be significant association between pre-test knowledge knowledge scores of adolescent girls with their selected demographic variables.

### Variables under study

**Dependent variables:** Anemia among adolescent girls.

**Independent variables:** Structured Teaching Program.

**Demographic variables:** Age, gender, religion, education, occupation, year of experience, type of family, marital status and income. Etc

### Delimitations of the study

- The period of data collections is limited to 3 weeks.
- Sample of study limited to 100 adolescent girls.

### CONCEPTUAL FRAMEWORK

A conceptual framework or a model is made up of concepts, which is an analytical tool that is used to get a comprehensive understanding of a phenomenon. The section deals with conceptual framework adopted for this study. A conceptual framework or model provides the investigator the guidelines to proceed to attain the objectives of the study based on a theory. It is schematic representation of the steps, activities and outcomes of the study.

Imogene king's goal attainment theory is based on the personnel and interpersonal systems including interaction, perceptions, communication, transaction, stress, growth & development, time and action.

Nursing is defined by Imogene king as "a process of human interactions between the nurse and the client where by each perceives the other and the situation and through communication they set goals, explore means and degree on means to achieve goals.

According to this theory the people meet in some situation, perceive each other, make judgment about the other, take some mental action and react to each one's of the other. The next step in the process is interaction; the last is transaction which is dependent upon the achievement of a goal. The investigator adopted King's goal attainment theory as a basis for conceptual framework, which is aimed to assess the effectiveness of booklets and videos on anemia among adolescent girls.

#### **The six major concepts of the phenomenon are described as follows:**

- 1. Perception:** Refers to person's representation of reading, it is universal, highly subjective and unique to each person. It is not observable but it can be inferred. Hence, the investigator's perception is, the adolescent girls may have average knowledge on anemia.
- 2. Judgment:** The investigator judged that the videos and booklets enhance the knowledge of anemia.
- 3. Action:** Investigator implements that structured teaching program enhance the good knowledge on anemia. The adolescent girls are ready and willing to participate in the study.
- 4. Reaction:** Reaction is not specifically defined but might be considered to be included in the

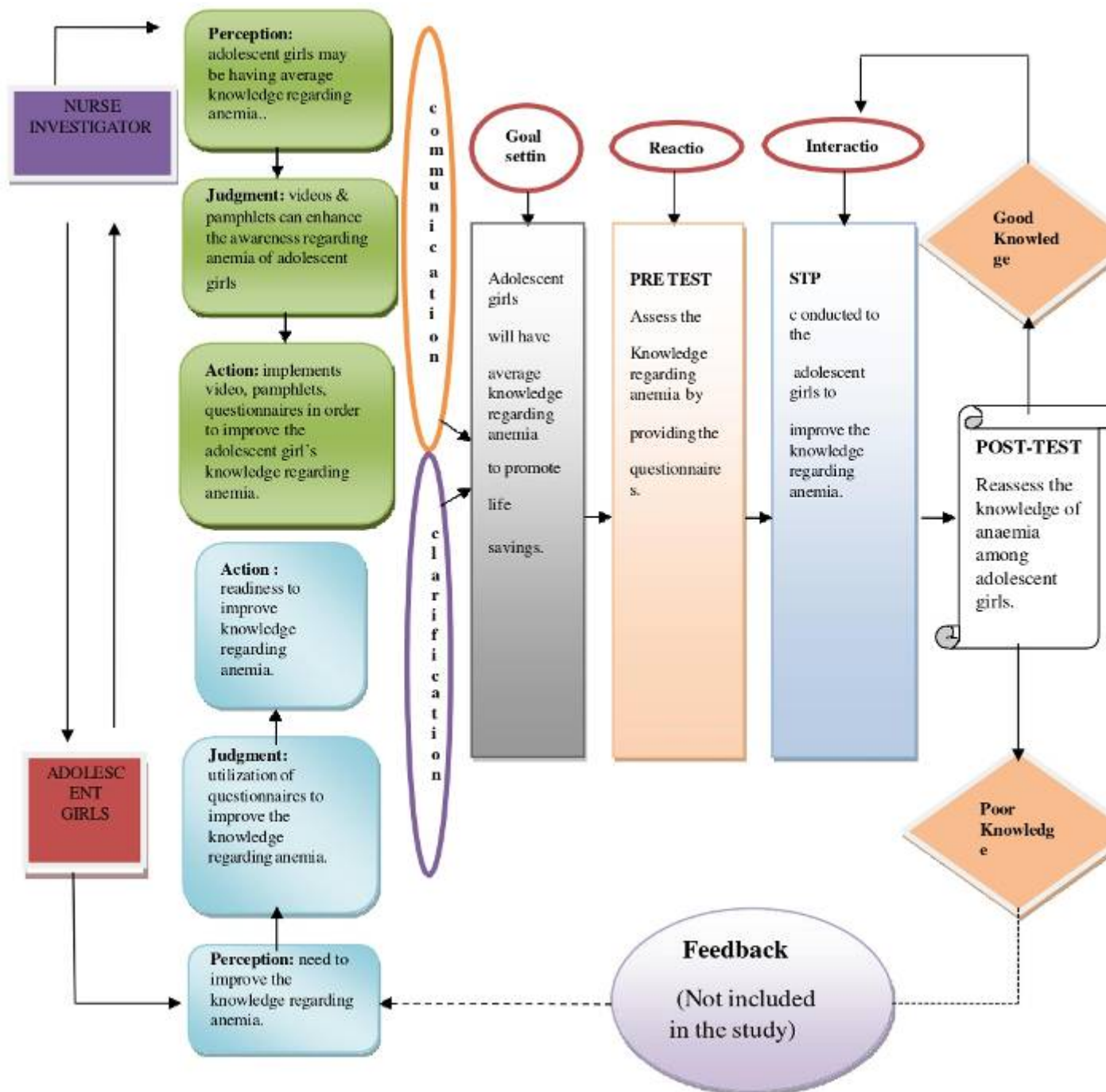
sequence of behaviors described in action and also referred as the process where adolescent girls transform information. In the present study the investigator arranges for videos, booklets and questionnaires on anemia and adolescent girls attended the interventional session.

- 5. Interaction:** It refers to the verbal and nonverbal behavior of individual with a purpose to achieve the goal. Hence the investigator interacts with adolescent girls by administered pretest, STP and posttest.
- 6. Transaction:** It refers to observable, purposeful behaviors of individual interactions with their environment to achieve the desired goal. At this stage, the investigator analyzes the knowledge of anemia of the adolescent girls in pretest. The positive outcome shows that increased the knowledge of anemia in posttest, which indicates the effectiveness of STP. The negative outcome was that there is absence of improvement in anemia of adolescent girls where the subjects need to be reinforced for further learning.

**Feedback:** The descent anemia indicates the effectiveness of STP on anemia of selected areas among adolescent girls by improved knowledge of anemia and average knowledge on anemia indicates that selected areas where the adolescent girls need to be reinforced for further learning.

#### **Summary**

This chapter dealt with the objectives, the operational definitions, variables, assumptions and hypotheses which are predictive statements of the relationship between the independent and dependent variables, and the delimitation of the study. The conceptual framework of the present study was based on the king's goal attainment theory.



**Fig1: Modified King's Goal Attainment Theory**

**2. REVIEW OF LITERATURE**

Review of literature is one of the most important steps in the research process. A review of literature enables one to get an insight into the various aspects of the problem under study. It covers promising methodological tools, throws light on ways to improve the efficiency of data collection and suggests how to increase effectiveness of data analysis and interpretation. Review of literature is therefore an essential step in the development of the research project.

The related literatures are presented in the following sub headings:

1. Studies related to anemia among adolescent girls.
2. Studies related to anemia with intervention among adolescent girls.

**1. Study related to anemia among adolescent girls:**

**Taye gari et.al (2017)** Repeated cross-sectional surveys among 2984 children in 2014 and 3128 children in 2015; and a cohort study (malaria as exposure and anaemia as outcome variable) were conducted. The study area faced severe drought and food shortages in 2015. Anaemia was diagnosed using HemoCue Hb 301, and children with hemoglobin <11 g/dl were classified as anaemic. Multilevel and Cox regression models were applied to assess predictors of anaemia. The prevalence of anaemia was 28.2% [95% Confidence Interval (CI), 26.6–29.8] in 2014 and increased to 36.8% (95% CI, 35.1–38.5) in 2015 (P<0.001). The incidence of anaemia was 30; (95% CI, 28–32) cases per 100



children's years of observation. The risk of anaemia was high (adjusted Hazard Ratio = 10) among children with malaria. Children from poor families [Adjusted Odds Ratio (AOR); 1.3; 95% CI, 1.1–1.6], stunted children (AOR 1.5; 95% CI; 1.2–1.8), and children aged less than 36 months (AOR; 2.0; 95% CI, 1.6–2.4) were at risk of anemia compared to their counterparts. There was no significant difference in risk of anemia among the trial arms. Young age, stunting, malaria and poverty were the main predictors of anemia. An increase in the prevalence of anemia was observed over a year, despite malaria prevention effort, which could be related to the drought and food shortage. Therefore, conducting trials in settings prone to drought and famine may bring unexpected challenges.

**Kedir abdela gonete et.al. 2017:-** A school based cross-sectional study was conducted in Dembia District from March 1 to April 30/ 2017. Out of the randomly selected three high schools, 462 adolescents were included using the simple random sampling technique. A Standardized structured questionnaire was used to collect data. Capillary blood samples were drawn from adolescents using a portable Hb201+ instrument to measure haemoglobin. A bivariate and multivariable binary logistic regression analyses were employed to identify factors associated with anemia. Adjusted Odds Ratio (AOR) with a corresponding 95% Confidence Interval (CI) was computed to show the strength of associations. The overall prevalence of anaemia among adolescent girls was 25.5%, (95%CI, 21.4, and 29.2). Of the total anemic adolescents, 109(92.4%) had mild anaemia, while 7(5.9%) and 2(1.7%) were found with moderate and severe anaemia, respectively. Dietary diversity score ((AOR=4.2(95% CI;1.7, 10.5)), household food security status (AOR = 4.1(95% CI; 1.3, 13.2)), living status of adolescents with either of the two parents((AOR = 2;(95%CI;1.14,3.6)) and guardians (AOR = 2.4;(95% CI;1.02,5.6)) showed statistically significant association with anemia. Anemia is a moderate public health problem in Dembia, District. Dietary diversity score, household food security status, and living status of adolescents were the key determinants of anemia. Therefore, the government should focus on preventing food insecurity with increasing productivity to improve dietary diversification of the adolescent girls.

**Binaya chalise et.al. 2018:-** The cross sectional study was conducted in 2018 At the time of the survey, Nepal was administratively divided into five development regions, 14 Zones and 75 Districts. Each district was further divided into Village Development Committees (VDCs) and municipalities.

Geographically, Nepal consists of three regions reflecting mountains (Himal), hills (Pahad) and the lowland (Terai) regions. A nationally representative cross-sectional survey was conducted in 2014 among male and female (non-pregnant) adolescents aged 10 to 19 years old. We used a stratified cluster sampling method to select 3780 adolescents from 13 districts of Nepal.

A three-staged cluster sampling was performed within each stratum. The first stage of cluster sampling involved a random selection of 13 districts. For this purpose, we divided the entire country into 13 sub-regions as described in the 2011 NHDS. One district was randomly selected from each of the 13 sub-regions. This resulted in three districts being selected from the mountainous and five each from the hilly and lowland regions. The total number of strata was six, two (male and female) in each from three ecological regions. The second stage involved the selection of clusters from these districts. A total of 90 VDCs and municipalities (clusters) were chosen using the Probability Proportion to Size (PPS) sampling from the total VDCs and municipalities within those 13 selected districts. Within each chosen cluster, we selected a fixed number of 21 male and 21 female adolescents through a systematic sampling of households. We randomly selected an eligible participant if there was more than one eligible participant in the selected household.

The sample size was determined considering the national prevalence of anemia of 39% and an allowable error of 5%. A detail description of sample size calculation is reported elsewhere. The initial sample size was 365. Considering a design effect of 1.5 and multiplying the size by 6 (total number of strata), the sample size was 3290. We obtained the final sample size of 3655 after adjusting for a non-response rate of 10%. We then rounded up to 3780 to ensure an equal number of male and female participants from each stratum. Altogether, 3762 adolescents participated in the study. A detailed description of the sampling method is reported elsewhere. Trained enumerators conducted one-on-one interviews with adolescents using a pretested structured questionnaire, which covered information on socio-demographic characteristics, sanitation and nutrition. Participant height and weight was measured using stadiometer and digital weighing scale, respectively. Blood haemoglobin concentration was measured using the HemoCue method. Trained laboratory professionals conducted a procedure to collect capillary blood samples after obtaining written consent from both the adolescents and their parents. A sterile lancet was used to prick blood from a finger.

After discarding the first two drops, the third and fourth drops of blood were collected on a microcuvette. The microcuvette was then placed in a HemoCue machine after calibrating it to zero. Laboratory professionals referred HemoCue operation manuals for storage of microcuvette and analysis of blood samples.

**Seifu Hagos Gebreyesus et.al. 2019:-** The study employed a community based cross sectional design. The study was conducted on weekends to capture both in school and out of school adolescent girls. Data was collected from a total 1323 adolescent girls. From each district, we randomly selected villages and ensured that the sampled households had a range geographical spread (lowlands, highlands) within the larger category of rural and urban. We performed anaemia testing using HemoCue B- Haemoglobin analyser. We applied a complex survey data analysis method to estimate the level of anaemia. The haemoglobin level was adjusted for altitude and smoking status. We ran a logistic regression model to evaluate predictors of anaemia. The overall anaemia prevalence ranged from 24 to 38%, with an average rate of 29%. Less than half of the girls heard the term anaemia, and about one third knew the relationship between anaemia and the intake of iron rich foods. The risk of anaemia is higher among adolescent girls in their early adolescence period (10–14 years) (Adjusted Odds Ratio (AOR); 1.98; 95% CI; 1.03, 3.82] and among adolescent girls who lived in moderately food insecure households (AOR 1.48; 95% CI; 1.05–2.09). However, knowing the term “anaemia” was found to be protective against the risk of anaemia.

**J nutr Metab et.al. 2019:-** A cross-sectional study was conducted among 424 randomly sampled adolescent girls in the Tamale Metropolis of Ghana from April to July 2019 using an interviewer-administered structured questionnaire. Twenty school health coordinators were purposively selected to answer questions on the challenges they face in implementing the IFAS program at the school level. Bivariate logistic regression and multivariate logistic regression were used to determine associations and strength of associations, respectively, at a significant threshold of  $p < 0.05$ . Compliance with the IFAS was low (26.2%). Adolescent girls who were aware of anaemia (AOR = 3.57 (95% CI: 1.96, 6.51)  $p < 0.01$ ), had good knowledge of anaemia (AOR = 1.82 (95% CI: 1.17, 2.81)  $p=0.01$ ), and had good knowledge of the IFAS program (AOR = 2.29 (95% CI: 1.47, 3.57)  $p < 0.01$ ) were significantly associated with compliance with the IFAS. The majority (60%) of the adolescent girls have ever missed taking the iron and

folic acid (IFA) tablet because it was not issued to them by the teacher's concern while about 48.3% (169) of the adolescent girls are taking the tablet because it prevents anaemia. Adolescent girls perceiving the tablet as family planning medicine (88.8%) and unavailability of water in classrooms (18.8%) were cited as the major challenges by school health coordinators.

**Aparajita Chattopadhyay et.al. 2019:-** As a part of an intervention programme, this study is based on baseline cross-sectional data. It was conducted between May 2016– April 2017 in three Indian states (Bihar, Odisha, and Chhattisgarh). From a sample of 6352 adolescent girls, information on WASH practices, accessibility to health services and anthropometric measurements (height, weight and mid upper arm circumference (MUAC)) was collected. Descriptive statistics were used to examine WASH practices, and nutritional status among adolescent girls. Determinants of open defecation and menstrual hygiene were assessed using logistic regression. Association between WASH and nutritional status of adolescent girls was determined using linear regression. Findings showed 82% of the adolescent girls were practicing open defecation and 76% were not using sanitary napkins. Significant predictors of open defecation and non-use of sanitary napkin during menstruation were non Hindu households, households with poorer wealth, non-availability of water within household premise, non-visit to *Anganwadi* Centre, and non-attendance in *Kishori* group meetings. One-third of adolescent girls were stunted, 17% were thin and 20% had MUAC < 19 cm. Poor WASH practices like water facility outside the household premise, unimproved sanitation facility, non-use of soap after defecation had significant association with poor nutritional status of adolescent girls. Concerted convergent actions focusing on the provision of clean water within the household premise, measures to stop open defecation, promotion of hand washing, accessibility of sanitary napkins, poverty alleviation and behavior change are needed. Health, nutrition and livelihood programmes must be interspersed, and adolescents must be encouraged to take part in these programmes.

**Amaha kahsay et.al. 2020:-** We employed an explorative qualitative study among purposively selected adolescent girls and school teachers from rural districts of Tigray region. We conducted 11 focused group discussions with adolescent girls, 17 in-depth interviews (seven with teachers, seven with in-school adolescent girls, and three with out-of-school adolescent girls) using a semi-structured guide.



Data was audio-taped, transcribed verbatim in local language, translated into English, and imported into ATLAS.ti version 7.5 qualitative data analysis software for analysis. Adolescents perceived that stunting, anemia, and thinness are among the main nutritional problems in their community. Food insecurity, limited nutrition awareness in the community, limited access to a water source, high workload, service provider's little attention for adolescents' nutrition, and food taboo have emerged as barriers for the uptake of adolescent girls' nutritional interventions. Though limited in reach, available nutritional interventions include awareness creation, nutritional supplementation, and disease prevention. Food insecurity poses a strong challenge to adolescent girls' nutrition. As access to safe drinking water continues to be a considerable bottleneck for nutritional interventions, a multi-sectoral response to integrate water, sanitation, and hygiene (WASH) services is required. Bounded by food taboo, high burden of workload among the adolescent girls, women empowerment and nutritional status seems to be the unfinished agenda in resource limited settings such as the rural areas of Tigray region.

**Rina agustina et.al. 2020:-** We conducted a cross-sectional survey in 335 school-going adolescent girls aged 12–19 years from three districts in West Java using multi-stage cluster sampling. Meal patterning, Dietary Quality Index for Adolescents (DQI- A), and Dietary Diversity Score (DDS) were determined using 2-day 24-h recall. Of the girls, 45% were anemic and 17% overweight or obese. Eating occasions of 3–4 times (AOR 2.68, 95% CI 1.21–5.98) and >4 times (AOR 2.43, 95% CI 1.01–5.83) were associated with greater odds of developing anemia compared to eating occasions of <3 times. Adolescent girls who skipped dinner had greater odds of being overweight or obese (AOR 2.13, 95% CI 1.10–4.10) and were less likely to be anemic (AOR 0.56, 95% CI 0.33–0.95) compared to those who did not skip dinner. Difference in energy intake was found between girls who had dinner and skipped dinner ( $p = 0.05$ ). Mean total DQI-A score was  $44.4\% \pm 7.71\%$  and DDS was 4.0 out of 9.0. DQI- A score was significantly higher in non-anemic compared to anemic girls. Moreover, each unit increment of 1% of total DQI-A score was associated with a 3.967 g/dL increases of haemoglobin after adjustment for confounders. We found differences in total DQI-A score between normal-weight and overweight or obese girls. DDS score was not significantly different between groups, although lower meat, chicken, and fish consumption were correlated with anemia ( $p < 0.01$ ). Overall, the girls had poor dietary quality

and diversity. The findings therefore indicated the importance of improving dietary quality and diversity in a regular meal pattern, especially meal frequency and meal skipping, to reduce the risk of anemia and overweight-obesity among adolescent girls.

**Kelemu Fentie et.al 2020:-** Data were collected from 528 secondary school adolescent girls by a school-based cross-sectional study design in Jimma town from 1/1/2019 to 1/2/2019, southwest Ethiopia. A multistage sampling technique was used to select the study participants. A portable battery-operated HemoCue Hb 301+ analyser was used to measure the haemoglobin level, and then reading was classified as normal  $Hb \geq 12$  g/dl and anemic if the haemoglobin value  $< 12$  g/dl based on the WHO 2011 recommended cut-off points after adjustments to altitude was made. Bivariate analysis at  $p$  value  $\leq 0.25$  was considered as a candidate for multivariable logistic regression. Multivariable logistic regression was done to control for confounders and to identify factors independently associated with anemia. Level of statistical significance was declared at  $p < 0.05$ . A total of 528 adolescent girls were included in the study yielding a response rate of 95.8%. The prevalence of anemia was found to be 26.7%, 95% CI (22.7, 30.50). In multivariate logistic regression analysis, those living separately from their family (AOR = 4.430, 95% CI (2.20, 8.90)), low dietary diversity score (AOR = 3.57, 95% CI (1.88, 6.75)), menstrual bleeding more than 5 days (AOR = 2.25, 95% CI (1.17, 4.33)), and low economic status (AOR = 2.16, 95% CI (1.17, 4.33)) were positively associated factors with anemia and only having at least a secondary school in mother's educational status AOR = 0.43, 95% CI (0.18, 0.97) was negatively associated with anemia in the study area.

**Nazneen Habib et.al.2020:-** A cross-sectional study was conducted for assessing anemia prevalence and its societal factors among adolescent school girls. The study and its ethical clearance were approved by the board of advanced studies and research of International Islamic University. Informed consent of the respondents and their parents was also obtained before interview. The purpose of the study was orally explained to the respondents and their mothers. Confidentiality of the information and privacy of the respondents were also maintained. The study was conducted in the Muzaffarabad division, Azad Jammu and Kashmir (AJK), Pakistan, which comprises mountainous topography. AJK has three divisions and 10 districts [19, 20], and Muzaffarabad division was randomly selected for this study. The government and private-sector jobs, small businesses, livestock, tourism, horticulture, and collection of medicinal

herbs are the main sources of livelihood. The region is badly affected by natural and manmade hazards. Because of limited job opportunities in the government and private sectors, a majority of people are working in Pakistan and abroad. Natural disasters and the firing across the line of control between Pakistani and Indian army has badly affected infrastructure, tourism, and hence the economic well-being of the people. Poverty and inadequate health facilities at far flung areas, insufficient diet, unawareness about anemia, and its health consequences make the female population vulnerable to iron deficiency anemia (IDA).

## 2. Studies related to anemia with intervention among adolescent girls.

**Mohan Joshi et.al. 2013:-** Randomized controlled trial was conducted in adolescent girls visiting 'Urban Health and Training Centre' during the study period June, 2011 to October, 2012. The 120 anaemic (Haemoglobin < 12 gm%) adolescent girls (10-19 years) were distributed randomly by block randomization in two groups; one receiving daily Iron and Folic Acid supplementation and in other group receiving weekly Iron and Folic Acid supplementation for 3 months. All the study subjects were given de-worming (Albendazole 400 mg) and required health education separately. Both the groups were monitored for Haemoglobin estimation, compliance and adverse drug reactions, if any. Open-Epi Statistical Software was used for data analysis. The mean age of study subjects in 'Daily Iron and Folic Acid Supplementation' and 'Weekly Iron and Folic Acid Supplementation' group was 13.48 and 13.55 years respectively. Their mean pre intervention Haemoglobin was  $10.1 \pm 1.1$  gm/dl and  $10.4 \pm 1.1$  gm/dl respectively. The mean rise in Haemoglobin after lean period of 1 month in respective groups was almost equal i.e.  $1.0 \pm 0.7$  gm/dl and  $1.0 \pm 0.8$  gm/dl. Adverse Drug Reactions were 8.3% in weekly regime as compared to 13.35% in daily regime, abdominal pain being the commonest adverse drug reaction seen. The compliance calculated as mean of unconsumed 'Iron and Folic Acid' tablets was  $6.1 \pm 10.98$  in 'Daily Iron Folic Acid Supplementation' group, while it was  $1.3 \pm 3.15$  in 'Weekly Iron Folic Acid Supplementation' group ( $p=0.0012$ ), making weekly regime more promising than daily regime with better treatment compliance.

**Aparajita Chattopadhyay et.al. 2019:-** The study is a part of the SWABHIMAN programme which aimed at improving the nutritional status of adolescent girls, pregnant women, and mothers of children less than two years age in three poverty pockets of India (Bihar, Odisha, and Chhattisgarh) dominated by tribal

population. As a part of this programme, primary data amongst adolescent girls (10– 19 years) were collected between May 2016 and April 2017 from Purnea district (Jalalgarh and Kasba blocks) of Bihar, Angul district (Pallahara block) and Koraput district (Koraput block) of Odisha and Bastar district (Bakawand and Bastar blocks) of Chhattisgarh. Based on the outcome indicators and the change envisaged, a representative sample of 6352 (Bihar: 1704; Odisha: 1727 and Chhattisgarh: 2921) adolescent girls was drawn using the simple random sampling. Forty 6 % sample population belongs to scheduled tribe. Data were collected by trained teams, consisting of trained supervisors and field investigators.

A pre-tested, structured, bilingual questionnaire in Bihar and Chhattisgarh (English and Hindi), and Odisha (English and Odia) were used to elicit information on: i) socio-demographic profile, ii) WASH practices (main source of drinking water, accessibility of water facility, type of sanitation facility used, practice of open defecation, use of soap after defecation and use of napkins during mensuration), iii) adolescents' access to health services (accessed health service in last six months, visited *Anganwadi* (rural child care centre in India), accessed any health services, counselling by a frontline health worker, attended any *Kishori* (Adolescent girl) group meetings and able to make decision about own healthcare, iv) anthropometric measurements (weight, height and mid upper arm circumference (MUAC)) were collected using the standard technique.

Weight was measured in kilogram (without shoes) using a SECA electronic weighing scale recorded to the nearest 0.1 kg. Height was taken barefooted using stadiometer nearest to 0.1 cm. Mid Upper Arm Circumference was measured in centimetres with a non-stretchable measuring tape nearest to 0.1 cm. The tape was placed firmly but gently on the arm to avoid compression of soft tissue. Quality control checks were conducted for 10% of the interviewed population. The weighing scales and stadiometer were calibrated on a weekly basis prior to data collection with standard weights (1, 2 and 5 kg) and a meter rod (100 cm). The mean standard errors of measurement for height, weight, and MUAC across all the data collection teams were insignificant and ranged between 0.001–0.025 ( $p < 0.10$ , CI = - 0.004–0.042).

**Rediet Takele Regasa et.al 2019:-** A school based cross-sectional study was conducted among school going adolescent girls of Wayu Tuqa district, south west Ethiopia and a 3-stage random sampling technique was used to select study participants. Data

were entered into EpiData version 3.1 and analysed using STATA version 12. Haemoglobin was measured by HemoCue 301+ photometer and WHO Anthro-plus software Version 1.0.4 was used to calculate BMI for age z-score. Both bivariate and multivariate analyses were performed to check associations and control confounding. A  $p$ -value  $<0.05$  was considered statistically. The prevalence of anaemia among adolescent girls was a moderate public health problem. To improve the prevailing nutritional problem, there must be inter-sectorial collaboration among health sectors and education sectors in providing nutritional education and counselling based on age and menarche status.

**PLoS ONE el.at 2020:-** A cross-sectional study was conducted in three districts of West Java province, Indonesia, in 2016 as a part of the baseline survey of 'Iron Folate Supplementation Program' conducted by the Department of Nutrition, Faculty of Medicine, Universities Indonesia for Nutrition International. The subjects were school-going adolescent girls aged 12–19 years. Minimum sample sizes of 240 and 191 were required to detect associations between dietary quality and anaemia, as well as, overweight-obesity, with logistic regression analysis (95% confidence interval, 80% power, assumed OR 1.79 for low dietary quality to be anaemic and OR 0.55 for high dietary quality to be obese. With a probable non-response rate of 10%, a total sample of 300 was decided. As the current study was a part of a baseline data of the larger intervention study of iron folic acid supplementation, the eventual number of respondents corresponded to this study with a total of 340 adolescent girls. This number was powered to detect a 15% point change between 18.4% assumed anaemia prevalence in adolescent girls and an anticipated 3% at end line survey. The analysis was for two sample tests with standard statistical assumptions (two-sided test;  $\alpha = 0.05$ ; 0.8 power, and non-continuity), rounded up to account for end line survey, design effect, and assumed non-response rate. The use of 340 sample enables better power for the current study outcomes.

### Summary

Further research is needed to better understand the positive and negative factors that are associated with

anemia among adolescent girls. This study contributes to a better understanding of anemia among adolescent girls.

### 3. METHODOLOGY

Research methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. (Kara, Helen (2015)

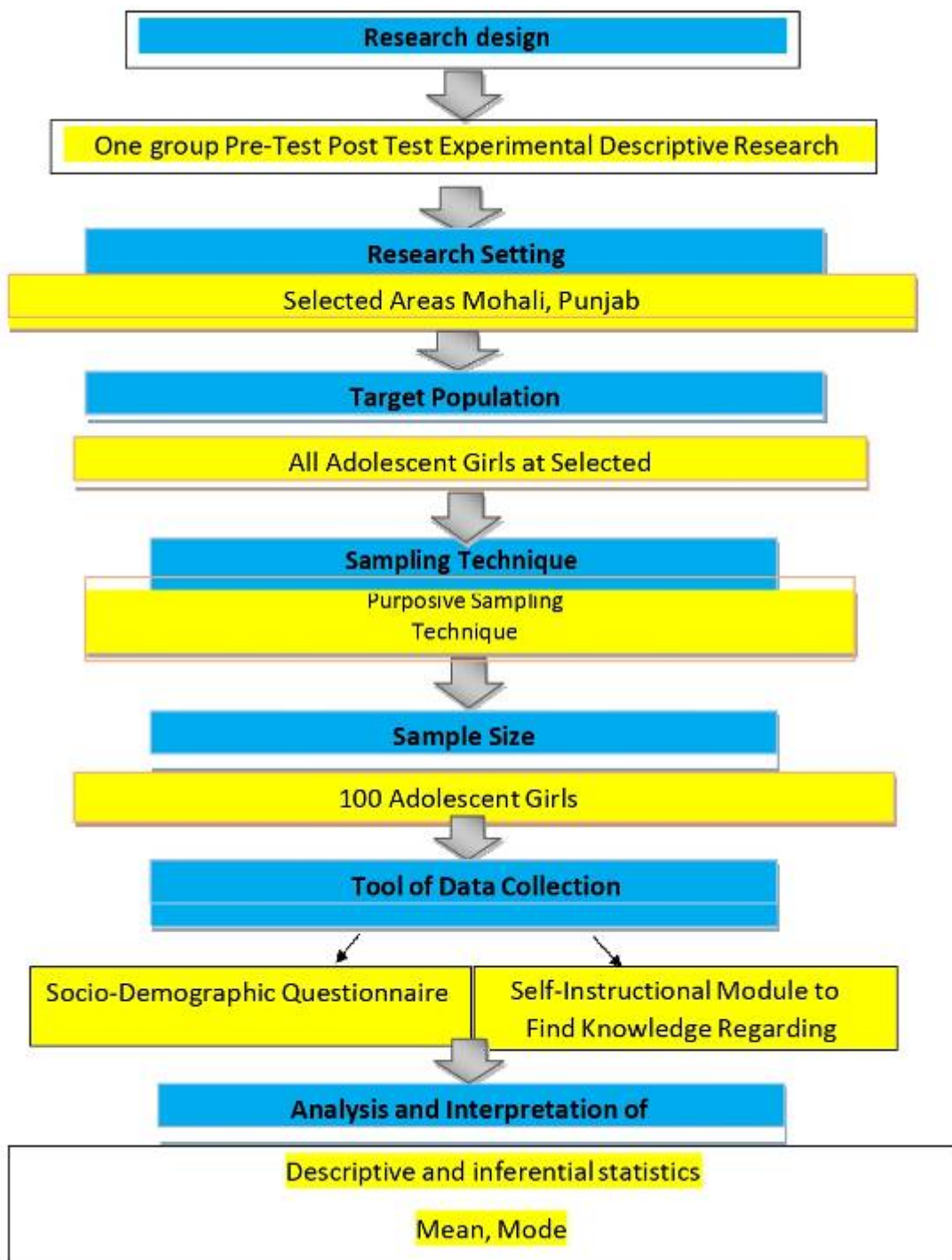
It is mandatory in research as its framework for conducting the study. Methodology is most important in research, as it is the framework for conducting a study. It indicates the general pattern for organizing procedure to gather valid and reliable data for investigation. Research methodology is a generally guideline system for solving the research problem, with specific components as phases, tasks, method, techniques and tools. It refers to the investigation and the way of obtaining, organizing and analysing data.

This chapter deals with a study to assess the effectiveness of structured teaching programme on knowledge regarding prevention and prevalence of anemia among adolescent girls in a selected areas Mohali, Punjab.

This chapter includes:

- Research design
- Research Settings
- Population
- Sample and sampling technique
- Inclusion and Exclusion Criteria
- Development and description tool
- Validity of Research Tool
- Pilot study
- Reliability of Research Tool
- Ethical consideration
- Procedure for Data Collection
- Plan for data analysis
- Summary





**Figure 2. Schematic Representation of Research Methodology.**

**RESEARCH DESIGN**

The term research design is defined as a blueprint for conducting a study with maximum control over factors that may interfere with the validity of findings.

**(Burns and Grove 2003).**

Research approach- In the present study Quantitative Research Approach was used.

Research Study- In the present study One group pre-test post-test experimental research design

**RESEARCH SETTING**

Setting is the physical location and condition in which the data takes place in a study “as said by **Polit and**

**Hungler**”. The criterion for selection of this setting is feasibility of conducting study in the setting and investigators familiarity with the setting and people. This study is conducted in selected areas Mohali, Punjab.

**TARGET POPULATION**

**Polit and Hungler (1991)** described “population as the entire set of individuals having some common characteristics”.

The population in the present study included 100 all adolescent girls at selected setting of Mohali, Punjab.

**SAMPLING TECHNIQUE AND SAMPLE SIZE**

**Polit and Hungler** said, “sample is a subject of population selected to participate in a research study”.

S.K Sharma, 2011 said that “Sample consists of subsets of units which comprise the population selected by investigators or researcher to participate in their research project”.

In the present study 100 all adolescent girls at selected setting of Mohali, Punjab were drawn by purposive sampling technique.

### INCLUSION AND EXCLUSION CRITERIA

#### Inclusion criteria:

It includes the adolescent girls :

- Ready or medically fit to participate in the study.
- Present during the time of data collection.
- People who are willing to participate.
- People who are able to read, write and understand English.

#### Exclusion criteria

- People who are suffering from medical illness or not medically fit.
- People who are not willing to participate in the study.

### DEVELOPMENT AND DESCRIPTION TOOL(S)

#### A. DEVELOPMENT OF THE TOOL

Data collection tools are the devices that a researcher uses to collect data. A search for literature was made for the purpose of locating appropriate tools.

The present study aimed to assess the effectiveness of structured teaching programme on knowledge regarding prevention and prevalence of anemia among adolescent girls in a selected areas Mohali, Punjab. The following data tools were used in order to obtain data:

- A structured demographic sheet.
- Self-structured questionnaire.

A Self -Structured questionnaire is developed by extensive literature review, consultation with experts in nursing fraternity, opinion from teachers, personal experience and by researchers.

#### B. DESCRIPTION OF THE TOOL

The study aimed to assess the effectiveness of structured teaching programme on knowledge regarding prevention and prevalence of anemia among adolescent girls in a selected areas Mohali, Punjab. Tool comprises of two sections-

#### SECTION-A: DEMOGRAPHIC VARIABLES:

This section of tool consists of items pertaining to selected demographic variables of adolescent girls which include age, religion, educational status, occupation status of the parents, living status of the adolescents, and type of family, monthly family income, type of residence and no. of siblings etc.

#### SECTION-B: QUESTIONNAIRES REGARDING

**ANEMIA:** This consists of 30 questionnaires to evaluate the knowledge of anemia among adolescent girls in the selected areas. The valid items of questions were related to the perception and knowledge of girls towards anemia, nutritional status of girls, monthly family income, living status of the family, lots of care from family members during the menarche, how parents spend their money for healthy diet among adolescent girls, prevention methods of anemia, how does iron deficiency anemia affect teenagers, how to spend the habits before and after menarche period and what are the problems & complications.

The total number of questions was 30. Each question consists four independent responses. All the questions were having four responses. For each correct response one marks and zero marks for wrong response.

**Scoring Interpretation:** Scoring interpretation was classified into three levels based on the scores as follows: -The maximum score will be 30 and the minimum score was

1. The total score of each subject were interpreted as follows:

S. No	Range of score	Interpretation
1.	1-10	Inadequate
2.	11-20	Moderate
3.	21-30	Adequate

**Table no.1 Represent Range of Score of Interpretation.**

#### Development of Structured Teaching Programmed-

The first draft on anemia of selected areas were developed based on the objectives of the study and was given to 5 experts along with objectives and the criteria of questionnaire. Based on their suggestions and recommendation the final drafts of the Structured Teaching programme were developed.

Structured Teaching programme that uses humor to help relieve anxiety, stress and improved an adolescent girl’s sense of well-being, and provided awareness, knowledge regarding anemia. It may be used to help girls cope with a serious problems and diseases. Video was shown to the adolescent girls. The technique of video showed that there were some anemic girls in video had weakness, fatigue, pale skin etc. Doctors/ health workers provided treatment and prevention regarding anemia in which they have showed how to improve anemic conditions, what type of food is taken, some exercises and about life styles of family. Also discussed about how to reduce the rate of anemia and how to prevent the complication and diseases and participants showed interest, they

felt good during the video session. The duration of STP was 25 to 30 minutes.

On first day, forty-five samples were selected and conducted the pre-test after that intervention was given to them (STP) after two days conducted the post-test from those samples. On third day, thirty-five samples were selected and same procedure done with them and on Fifth day, twenty samples were selected and intervention was given to them and conducted the post-test from those samples after two days of intervention i.e., on seventh day.

### VALIDITY OF RESEARCH TOOL

**Polit and Beck (2008)** state that validity is the degree to which an instrument measures what it is supposed to measure. Content Validity of tool was checked by:

- Consultation with the Guide and Co-guide regarding the validity of content of tool.
- Five experts from the fields of nursing department validated the tool for its content, relevance, clarity and sequence 1 gynecologist, 3 experts from the department of medical surgical nursing and 1 cardiologist.
- Relevant Modifications were made as per suggestions given by experts and discussion with Nursing guide and Co-guide. Changes were incorporated in the tool accordingly.

### PILOT STUDY

**Polit and Beck (2012)** state that a pilot study is a small- scale version or trial run designed to test the methods to be used in a larger, more rigorous study. Data from Pilot testing intervention can shed light on a number of things including the acceptability of the intervention to intended beneficiaries, intervention agent, the adequacy, comprehensiveness and clarity of intervention protocol, the appropriateness of the intervention, the extent to which intervention fidelity can be maintained, the rate of retention in intervention and safety of the intervention. The outcomes of Pilot study provide invaluable lessons that can inform subsequent efforts to generate valid evidence for nursing practice.

To assess the feasibility of the study a pilot study was conducted on 5 adolescent girls Topic was explained and permission was obtained from each subject and confidentiality was assured. The Pre-test was conducted by using questionnaires regarding anemia to the adolescent girls.

The post-test was conducted after five days, by using the same questionnaire on anemia for evaluating the knowledge regarding anemia.

The result of pilot study revealed that subjects were sufficiently available and the study was found feasible to conduct in reference of available time,

money, resources, administrative support and ethical limits. The language used in the tool was clear, adequate and appropriate. The data gathered from the 5 samples were looked into for the desired statistical analysis, using descriptive and inferential statistics.

### RELIABILITY OF RESEARCH TOOL

The reliability of an instrument is a major criterion for assessing its quality and adequacy. It is the ability of the data gathering device to obtain consistent result.

**Polit and Beck (2011)** state that the reliability of an instrument is the degree of consistency with which it measures the attributes it is supposed to be measuring.

The reliability of the tool was established by Karl Pearson's correlation coefficient formula. The tool was found to be reliable ( $r=0.670$ ) Therefore, the tool was found moderately reliable.

### POLICY RELEVANCE

A written ethical consideration was taken from Desh Bhagat University School of Nursing, Mandi Gobindgarh, Punjab. verbal consent was obtained from all the subjects. The subjects were given full autonomy to participate the research and withdrawal from research at any time. Anonymity confidentiality of the subjects was maintained while data collection. The nursing activities performed during research did not cause any harm to the study subjects. Before collecting data, permission was obtained from the Adolescents.

### PROCEDURE OF DATA COLLECTION

After obtaining formal permission from the concern people. The study was conducted in May 2021 in a week by using purposive sampling technique, the investigator given self-introduction, explained the purpose of the study and the subject's willingness to participated in the study was ascertain. The subjects were assured anonymity and confidentiality of the information provided by them and informed consent was obtained. The impact of questionnaires and video was administered after the pre-test. As the study needs 100 samples, the researcher took 100 samples from selected areas, Mohali.

The method of data collection adopted for the study was questionnaire on anemia. The subjects of the study were gathered in selected areas. After brief introduction of self, the investigator explained the purpose of the study.

A socio-demographic data sheet was filled by the Adolescents.

Pre-test was conducted by distributing the questionnaire on anemia and instructions were given



on data collection answering the questionnaire and doubts were clarified. Adolescent girls took 15-20 minutes to answer the demographic data and to fill the questionnaire. On the same day, videos and pamphlets was given to the group. Adequate explanation was provided wherever needed.

Post-test was conducted after one week and administered the same questionnaire on anemia. During the conduction of the study there was no problem encountered and subjects were co-operative to conduct the study. The coding was done to identify the subjects.

#### PLAN OF DATA ANALYSIS

Data analysis is the process of systematically applying statistical and logical techniques to describes and illustrate, condense and recap, and evaluate data. The investigator planned to analyses the data on the basis of the objectives and the assumption of study. The obtained was analyzed in the following ways:

1. Data was organized in the master data sheet.
2. Analysis of data was done on the basis of objectives of the study.
3. Computation of frequencies and percentage for the analysis of Socio- demographic variables
4. Criteria measurement to assess the effectiveness of structured teaching programme
5. Chi-square test was used to determine the association among adolescent girls regarding anemia and their selected socio- demographic variables.

#### EXPECTED OUTCOME

Responses of adolescent girls to the questionnaires will review their knowledge regarding anemia and structured teaching program may enhance the knowledge of adolescent girl about anemia by which the knowledge regarding anemia will be increased in the girls.

#### SUMMARY

This chapter deals with the research design, research settings, population sample and sampling technique, inclusion and exclusion criteria, development and

#### SECTION A: DESCRIPTION OF DEMOGRAPHIC DATA FREQUENCY AND PERCENTAGE

The section describes the demographic characteristics to assess the effectiveness of structured teaching programme on prevention and prevalence of anaemia among adolescent girls in Mohali, Punjab. The demographic characteristics are described in terms of Age, Religion, Educational Status, Occupational status of parents, Living Status, Type of Family, Monthly Family income , Type of Residence, Number of siblings, Age of menarche and Duration of menses.

Frequency and percentage distribution of Demographic characteristics are computed for describing the sample characteristics. These findings are presented in table.

description tool, validity of research tool, pilot study, reliability of research tool, policy relevance, procedure for data collection, plan for data analysis, summary.

#### 4. ANALYSIS AND INTERPRETATION OF DATA

Analysis and interpretation of data is the most important phase of research process, which involves the Computation of certain measures along with searching for patterns of relationship that exist among the data group. Data collection is followed by analysis and interpretation of data in accordance with study objectives.

**S.K SHARMA (2011)** defines analysis as a process of systematically applying statistical and logical techniques to describe, summarize and compare data.

#### OBJECTIVES

- Assessment of the pre-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls.
- Assessment of post-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls.
- Comparison of pre-test and post-test knowledge score of adolescent girls.
- To determine the association of the pre-test knowledge regarding prevention and prevalence of anaemia among adolescent girls and various demographic variables.

#### ORGANIZATION OF STUDY FINDINGS

**Section A:** - Description of Demographic data.

**Section B:** - Assessment of Pre-Test and Post-Test of Knowledge Score of Adolescent Girls Regarding Prevention and Prevalence of Anemia.

**Section C:** - Comparison of Pre-Test and Post Test Knowledge Scores of Adolescent Girls Regarding Prevention and Prevalence of Anemia.

**Section D:** - Association of Pre-Test Knowledge Scores of Adolescent Girls with Selected Demographic Variables.

Sr. No.	Demographical Variables	Frequency	%
<b>1</b>	<b>AGE</b>		
	12-13 years	20	20%
	14-15 years	30	30%
	16-17 years	30	30%
	18-19 years	20	20%
<b>2</b>	<b>RELIGION</b>		
	Hindu	30	30%
	Muslim	13	13%
	Christian	07	07%
	Others	50	50%
<b>3</b>	<b>EDUCATION STATUS</b>		
	8th	20	20%
	10th	41	41%
	12th	39	39%
	Nil	0	0%
<b>4</b>	<b>OCCUPATIONAL STATUS OF PARENTS</b>		
	Private job	34	34%
	Government job	20	20%
	Marketing manager	06	6%
	Business and financial operation	40	40%
<b>5</b>	<b>LIVING STATUS</b>		
	Rural area	50	50%
	Urban area	50	50%
	Tribal area	00	00%
	Any other	00	00%
<b>6</b>	<b>TYPE OF FAMILY</b>		
	Nuclear family	30	30%
	Joint family	50	50%
	Extended family	05	5%
	Single parent family	15	15%
<b>7</b>	<b>MONTHLY INCOME FAMILY</b>		
	Less than 10000	20	20%
	20000-40000	40	40%
	50000-80000	40	40%
	Above 80000	00	0%
<b>8</b>	<b>TYPE OF RESIDENCE</b>		
	Own	59	59%
	Rented	30	30%
	Hostel	05	5%
	Other	06	06%
<b>9</b>	<b>NUMBER OF SIBLINGS</b>		
	1	35	35%
	2	45	45%
	3 to 5	20	20%
	Above 5	00	00%
<b>10</b>	<b>AGE OF MENARCHE</b>		
	10-13 years	80	80%
	14-17 years	20	20%
	18-21 years	00	0%
	Above 22 years	00	0%

11	DURATION OF MENSES		
	0-3 days	11	11%
	3-5 days	25	25%
	5-7 days	50	50%
	More than 7 days	14	14%

Data presented in table shows that the age of adolescent girls between 12-13 years were 20% , 14-15 years were 30% , 16-17 years were 30% and 18-19 years were 20%(fig2). The religion data tells us that Hindu were 30% , Muslim were 13% , Christian was 7% and others were 50% (fig3) .In the group the educational status were 20% girls in 8<sup>th</sup> , 41% were in 10<sup>th</sup> and 39% were in 12<sup>th</sup> . In the group the occupational status of parents was , 34% were have private job, 20% were have government job, 6% were marketing manager and 40 % were have business and financial operation . In the Study the living status is 50% were living in rural area and 50% were living in urban area. In the Present study, the type of family of adolescent girls in nuclear family were 30% , in joint family were 50% , in extended family were 5% and in single parent family were 15%. In the Study, the monthly family income of less than 10000 were 20% , 20000-40000 were 40% , 50000-80000 were 40% and above 80000 were 0% . In the study, the type of residence is 59% were living in own residence, 30% were living in rented residence, 05% were living in hostel and 6% were living in other residence. In the Study, the number of siblings is 35% have 1 sibling, 45% have 2 siblings, 20% have 3 to 5 siblings and 0% have above 5 siblings . In the Present data , girls with age of menarche of 10- 13 years were 20% , girls with age of menarche of 14-17 years were 80% and girls with age of menarche of 18-21 and above 22 years were 0%. In the Data, duration of menses is 11% girls were having 0-3 days of menses, 25% girls were having 3-5 days of menses, 50% girls were having 5-7 days of menses and 14% girls were have more than 7 days of menses.

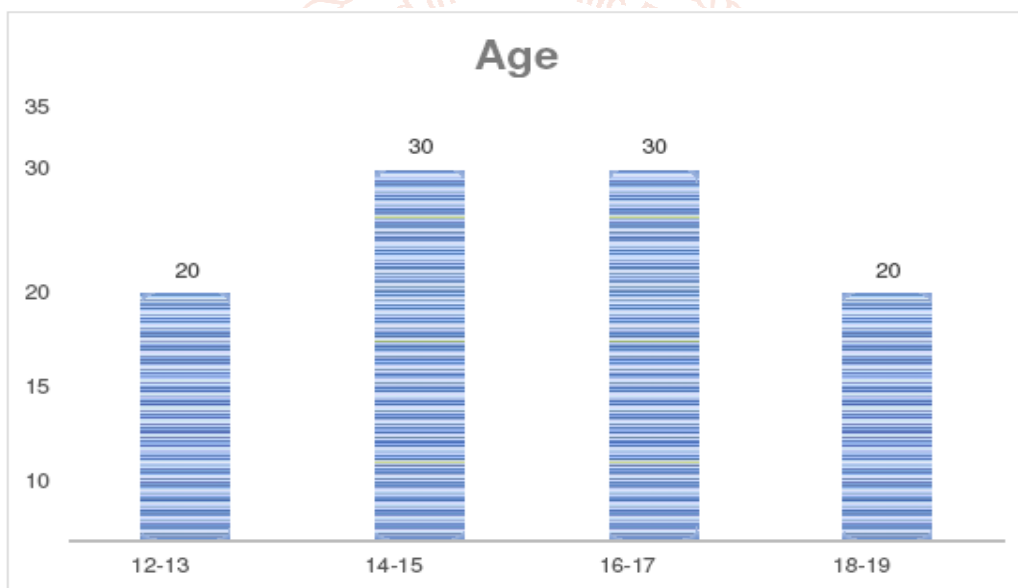


Fig. 2 Clustered Column Chart represent Age.

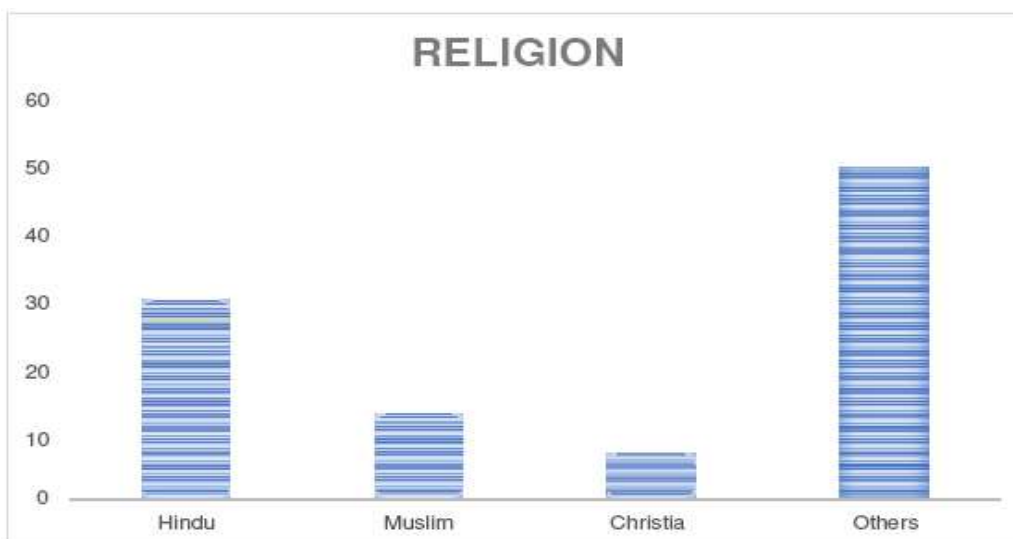
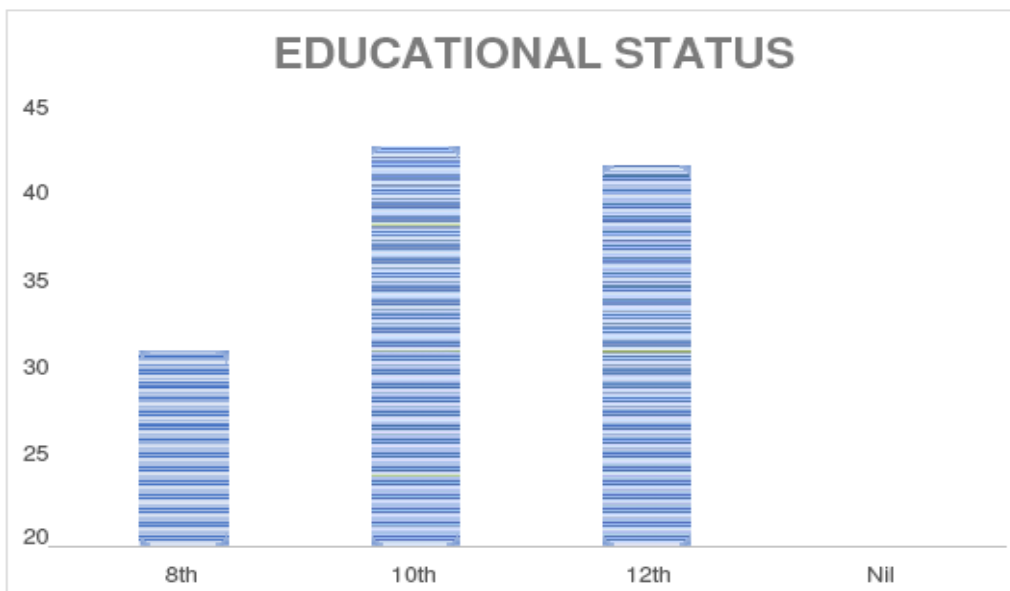


Fig.3 Clustered Column Chart represent Religion.

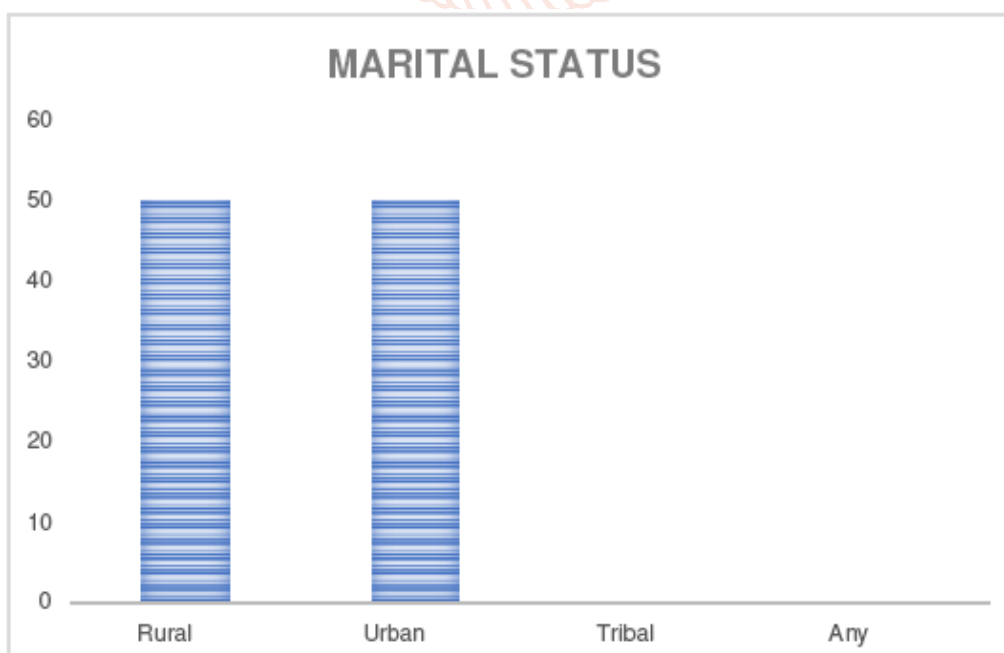




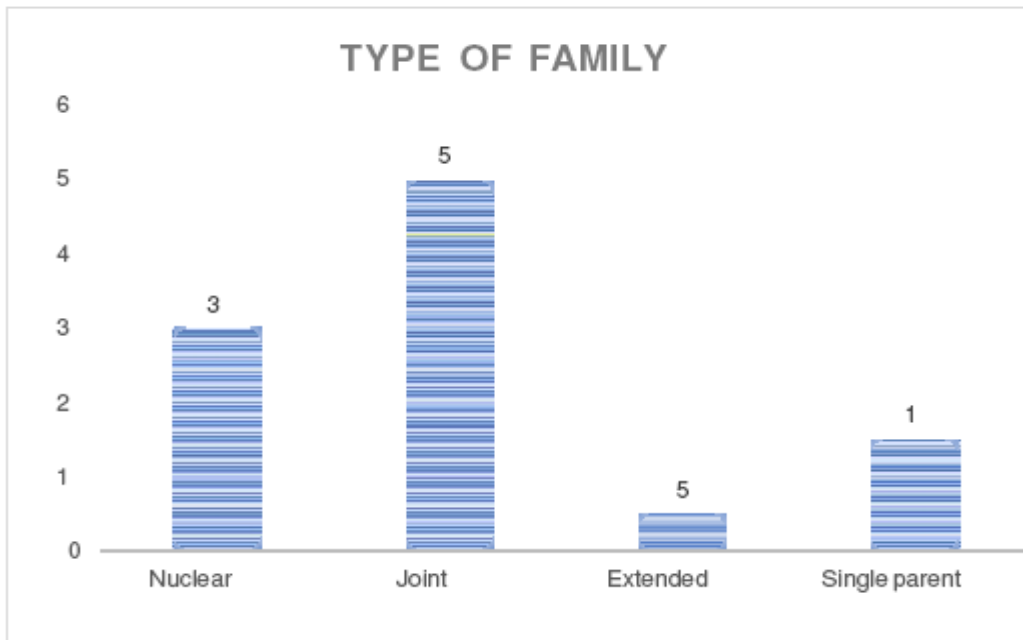
**Fig.4 Clustered Column Chart represent Educational Status.**



**Fig.5 Clustered Column Chart represent Occupational status of parents.**



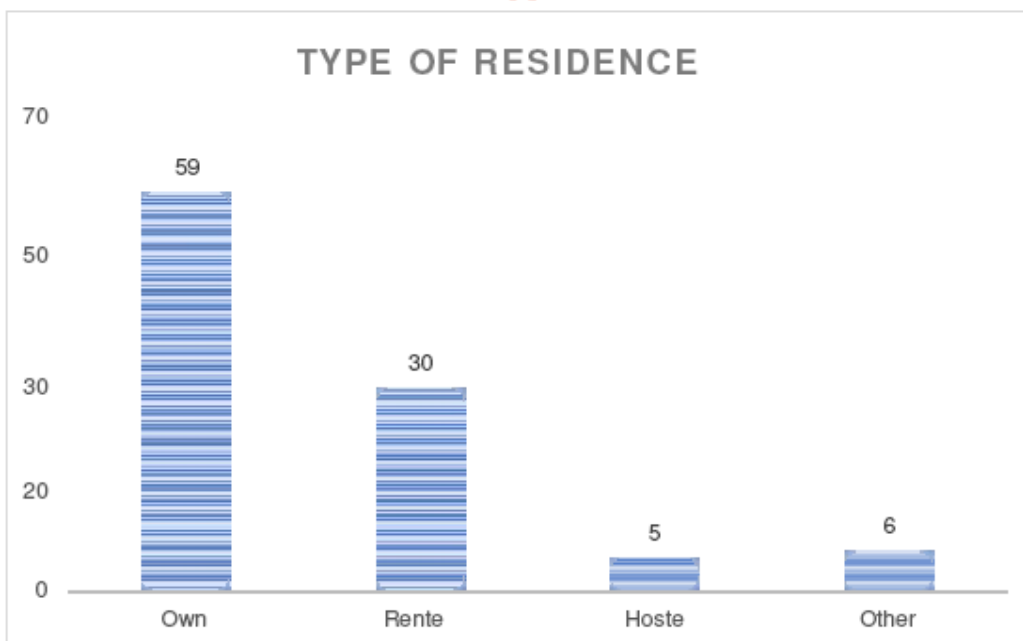
**Fig.6 Clustered Column Chart represent Marital Status.**



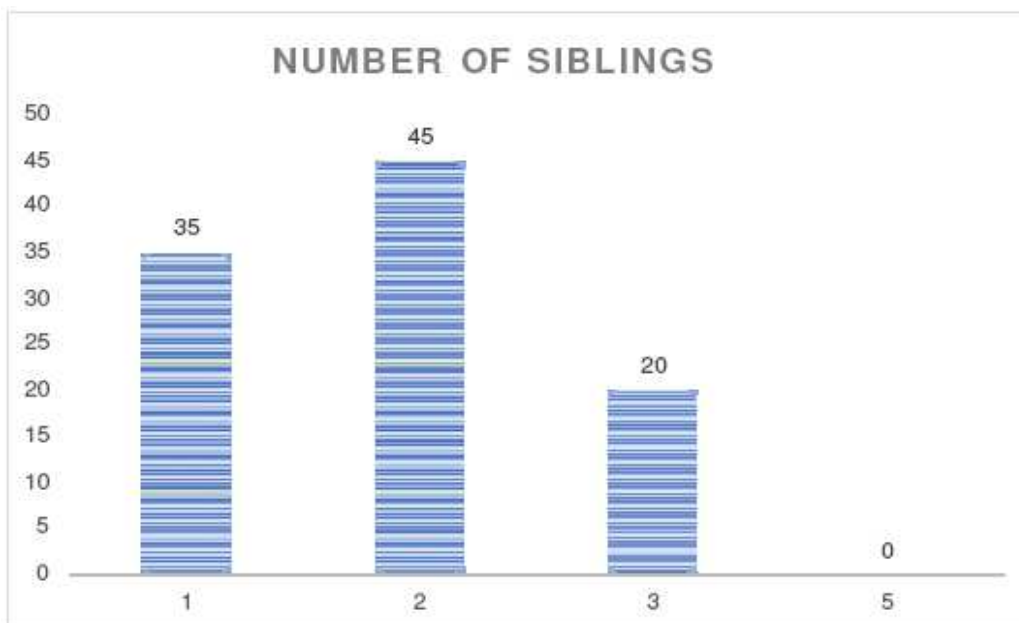
**Fig.7 Clustered Column Chart represent Type of Family.**



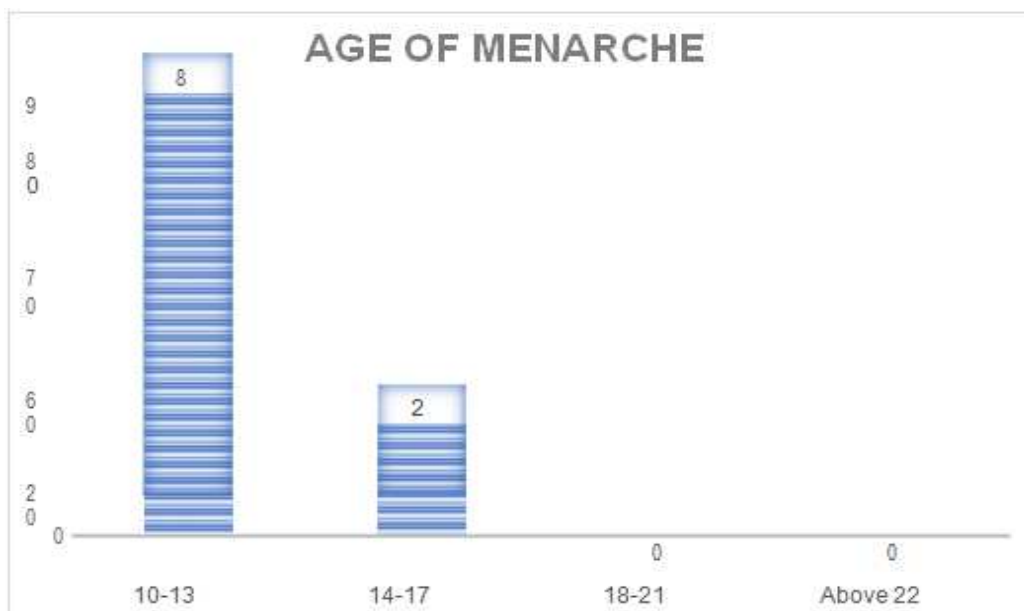
**Fig.8 Clustered Column Chart represent Monthly family income.**



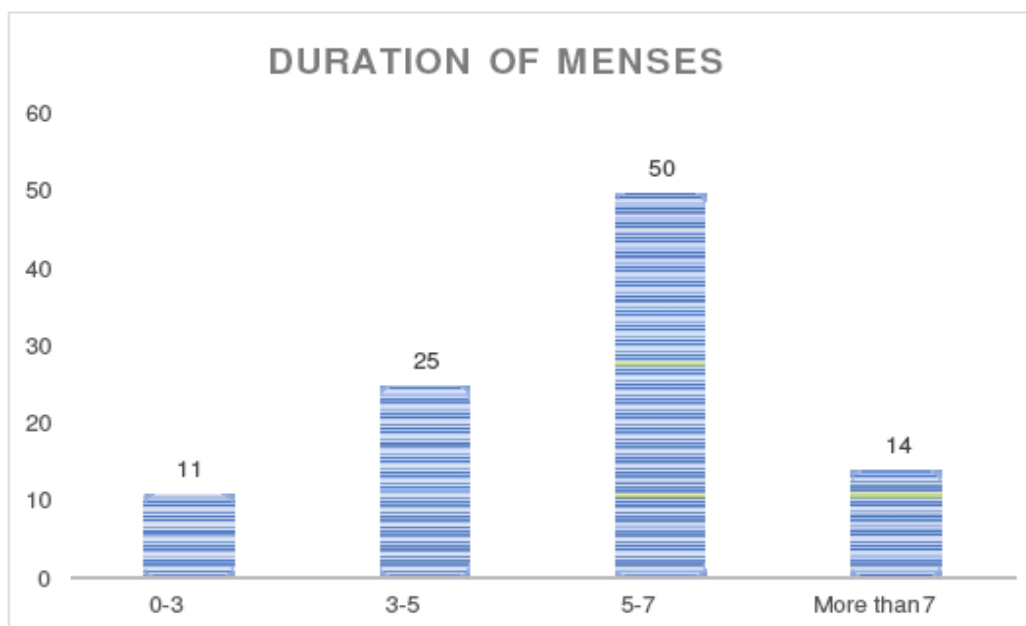
**Fig.9 Clustered Column Chart represent Type of residence.**



**Fig.10 Clustered Column Chart represent Number of siblings.**



**Fig.11 Clustered Column Chart represent Age of Menarche.**



**Fig.12 Clustered Column Chart represent Duration of menses.**



**Section B: Assessment of Pre-Test and Post-Test of Knowledge Score of Adolescent Girls Regarding Prevention and Prevalence of Anemia.**

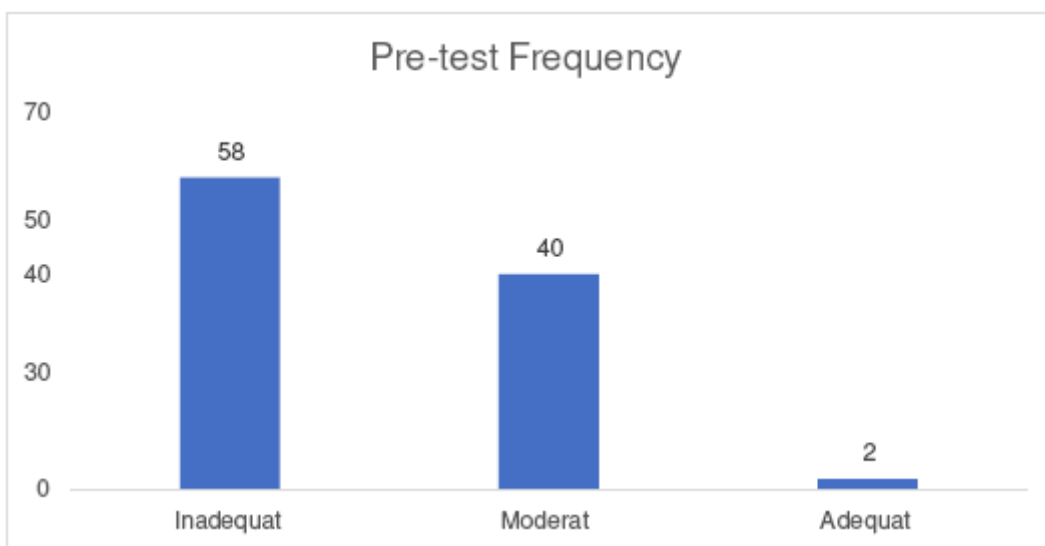
This section describes to assess the effectiveness of structured teaching programme on prevention and prevalence of anaemia among adolescent girls in Mohali, Punjab.

Frequency and percentage distribution of criteria measurement to assess the adjustment problems of Students is computed for describing sample characteristics. The findings are present in Table

**OBJECTIVE 1-** Assessment of the pre-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls.

Knowledge level	Pre test	
	Frequency (f)	Percent (%)
Inadequate	58	58%
Moderate	40	40%
Adequate	02	02%

Table . Illustrate that out of 100 adolescents 02% having adequate knowledge followed by 40% have moderate knowledge and 58% having inadequate knowledge. Hence, it concluded that majority of the adolescents have inadequate knowledge (58%).



**Table No 3: Descriptive Statistics table**

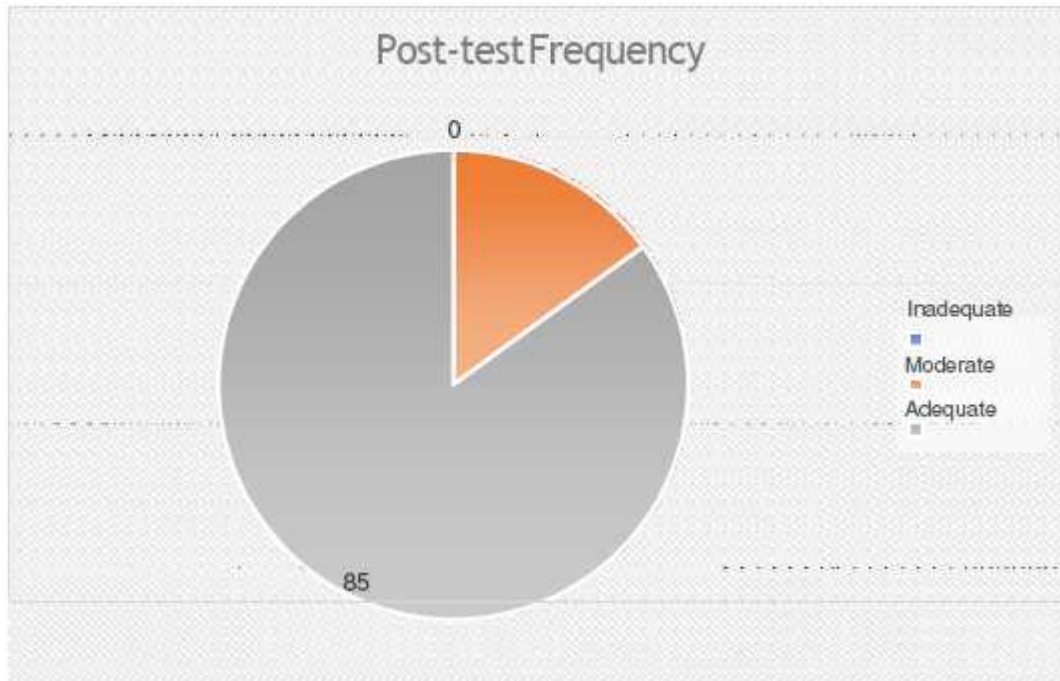
Descriptive Statistics	Mean	Median	S. D	Maximum	Minimum	Range
Level of Knowledge	10.78	10.00	4.414	21	3	18



**Table No.:** The above table showing Descriptive Statistics. This showed that median score was (10) followed by mean score was (10.78). Moreover, S.D. score was only (4.414). **OBJECTIVE 2-** Assessment of post-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls.

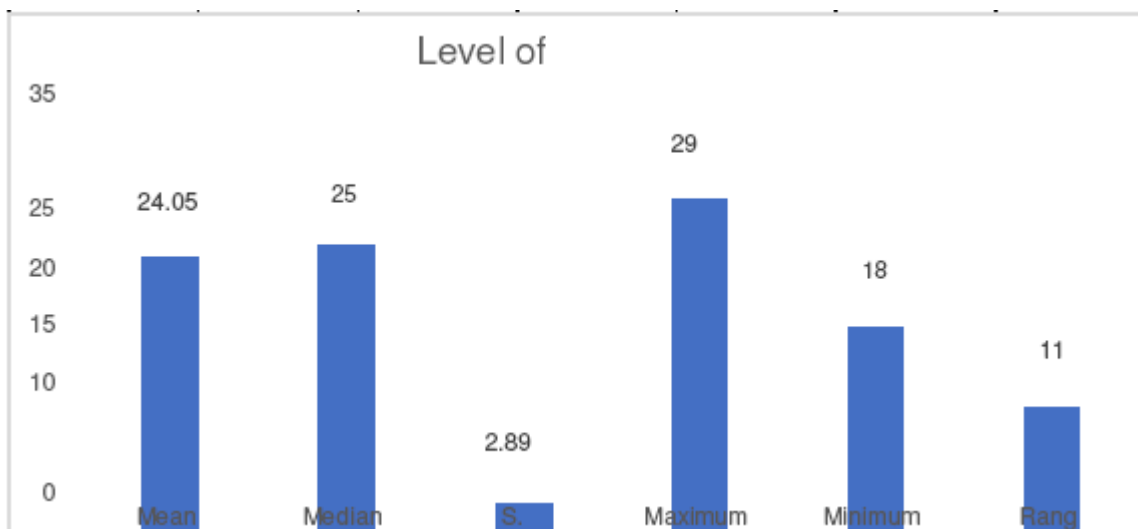
Knowledge level	Post test	
	Frequency	Percent
Inadequate	00	0%
Moderate	15	15%
Adequate	85	85%

Table . Illustrate that out of 100 adolescents 85% having adequate knowledge followed by 15% have moderate knowledge and 00% having inadequate knowledge. Hence, it concluded that majority of the adolescents have adequate knowledge (85%).



**Table No 3: Descriptive Statistics table**

Descriptive Statistics	Mean	Median	S. D	Maximum	Minimum	Range
Level of Knowledge	24.05	25.00	2.890	29	18	11



**Table No.:** The above table showing Descriptive Statistics. This showed that median score was (25) followed by mean score was (24.05). Moreover, S.D. score was only (2.89).

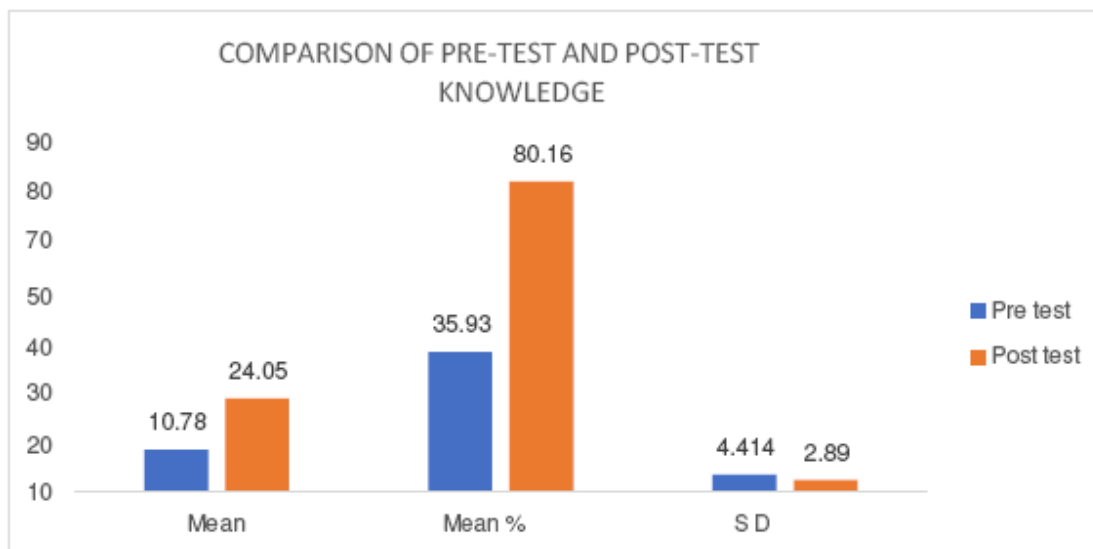
**Section C: Comparison of Pre-Test and Post Test Knowledge Scores of Adolescent Girls Regarding Prevention and Prevalence of Anemia.**

This section describes comparison of pre-test and post-test knowledge scores of adolescent girls regarding prevention and prevalence of anemia among adolescent girls in Mohali, Punjab.

**OBJECTIVE 3** -Comparison of pre-test and post-test knowledge score of adolescent girls.

**Table – Comparison of Pre-Test and Post-Test Knowledge Scores of Adolescent girls regarding prevention and prevalence of anaemia.**

N = 100							
Sr. No.	Knowledge	Mean	Mean %	S D	Enhancement	T Value	Df
1	Pre test	10.78	35.93	4.414	44.23%	25.554	99
2	Post test	24.05	80.16	2.890			



**Figure Comparison of Pre-Test and Post Test Knowledge Scores of Adolescent girls regarding prevention and prevalence of anaemia.**

Figure and table represent comparison of pre and post-test knowledge score of adolescent girls regarding prevention and prevalence of anaemia. In pre-test mean is having 10.78 and mean percentage 35.93%. In post-test, mean is having 24.05 and mean percentage 80.16%. Enhancement percentage is 44.23%. The difference between pre and post-test mean score revealed the effectiveness of structured teaching program among adolescent girls regarding prevention and prevalence of anaemia. Hence, there is highly significant increase in knowledge of adolescent girls regarding prevention and prevalence of anaemia after their exposure to structured teaching program. Therefore, H1 is accepted. Further, the paired t- test was used to find the significant difference between the pre and post-test knowledge score. Table shows that the t- value 25.554 is highly significant at  $p < 0.05\%$ . Hence there is significant difference between the pre and post-test knowledge scores and that difference is due to exposure of adolescent girls to structured teaching program on regarding prevention and prevalence of anaemia.

**Section D: Association of Pre-Test Knowledge Scores of Adolescent Girls with Selected Demographic Variables.**

This section describes association of pre-test knowledge scores of adolescent girls with selected demographic variables regarding prevention and prevalence of anemia among adolescent girls in Mohali, Punjab.

The Chi Square test was used to determine the association between the levels of knowledge with selected demographic variables.

The Chi Square values showing the association between level of knowledge regarding prevention and prevalence of anemia with their demographic variables of adolescents.

**Objective 4:** To determine the association of the pre-test knowledge regarding prevention and prevalence of anaemia among adolescent girls and various demographic variables.



Variables	Options	n	Mean	Sd	df	Result
Age	12-13 years	20	11.80	5.022	48	NS (0.540)
	14-15 years	30	11.10	4.831		
	16-17 years	30	9.97	3.624		
	18-19 years	20	10.45	4.286		
Religion	Hindu	30	10.40	4.190	48	NS (0.395)
	Muslim	13	10.85	4.240		
	Christian	07	14.29	5.469		
	Others	50	10.48	4.362		
Educational status	8th	20	11.80	5.022	32	NS (0.228)
	10th	41	10.73	4.658		
	12th	39	10.28	3.818		
	Nil	0	00	00		
Occupational status of the parents	Private job	34	10.38	5.051	48	NS (0.537)
	Government job	20	12.90	4.745		
	Marketing manager	6	10.33	3.011		
	Business and financial operation	40	10.10	3.586		
Living status	Rural	50	11.38	4.720	16	NS (0.508)
	Urban	50	10.16	4.047		
	Tribal	00	00	00		
	Other	00	00	00		
Type of family	Nuclear family	30	11.27	4.143	48	NS (0.195)
	Joint family	50	10.72	4.352		
	Extended family	05	9.00	1.581		
	Single parent family	15	10.53	5.805		
Monthly family income	Less than 10000	20	10.05	3.913	32	NS (0.785)
	20000-40000	40	11.33	4.376		
	50000-80000	40	10.58	4.722		
	More than 80000	00	00	00		
Type of residence	Own	59	8.73	2.722	48	NS (0.001)
	Rented	30	12.63	4.476		
	Hostel	05	18.40	2.191		
	Other	06	15.17	5.382		
No. of siblings	1	35	10.43	3.860	32	NS (0.105)
	2	45	10.20	4.521		
	3 to 5	20	12.65	4.793		
	More than 5	00	00	00		
Age of menarche	10-13 years	80	10.55	4.483	16	NS (0.689)
	14-17 years	20	11.65	4.133		
	18-21 years	00	00	00		
	More than 22 years	00	00	00		
Duration of the menses	0-3 days	11	11.55	3.012	48	NS (0.485)
	3-5 days	25	10.40	4.761		
	5-7 days	50	11.18	4.628		
	More than 7 days	14	9.36	3.934		

\*NS= not significant, S= significant

The data presented in the table shows that the sample of 100 adolescents in which the association between demographic variable of age and Knowledge is Not significant by 0.540, the association between demographic variable of religion and Knowledge is Not significant by 0.395, the association between demographic variable of Educational status and Knowledge is Not significant by 0.228, the association between demographic variable of Occupational status of the parents and Knowledge is Not significant by 0.537, the association between demographic variable of Living status and Knowledge is Not significant by 0.508, the association between

demographic variable of type of family and Knowledge is Not significant by 0.195, the association between demographic variable of monthly family income and Knowledge is Not significant by 0.785, the association between demographic variable of Type of residence and Knowledge is Not significant by 0.001, the association between demographic variable of No. of siblings and Knowledge is Not significant by 0.105, the association between demographic variable of Age of menarche and Knowledge is Not significant by 0.689, the association between demographic variable of Duration of the menses and Knowledge is Not significant by 0.485.

## SUMMARY

This chapter deals with the frequency and percentage table and graphs representing the Assessment of the pre-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls. Assessment of post-test knowledge score regarding prevention and prevalence of anaemia among adolescent girls. Comparison of pre-test and post-test knowledge score of adolescent girls. To determine the association of the pre-test knowledge regarding prevention and prevalence of anaemia among adolescent girls and various demographic variables. The chi - square test was done to determine the association between pre-test knowledge with their selected Demographic variables.

## 5. DISCUSSION

This chapter deals with the major findings of the study based on the interpretation from the statistical analysis. The findings are discussed in relation to the objectives of the study.

The purpose of the study was to assess the effectiveness of the Structured Teaching Program (STP) on knowledge regarding prevention and prevalence of anemia of adolescent girls.

## FINDINGS OF THE DEMOGRAPHIC VARIABLES

Description of the demographic data of adolescent girls

**Objective I:** assessment of the pre-test knowledge score regarding prevention and prevalence of anemia among adolescent girls.

**Objective II:** assessment of post-test knowledge score regarding prevention and prevalence of anemia among adolescent girls.

**Objective III:** Comparison of pre-test and post-test knowledge score of adolescent girls.

**Objective IV:** To determine the association of the pre-test knowledge regarding prevention and prevalence of anemia among adolescent girls and various demographic variables.

### Objective I: Findings of the demographic data of adolescent girls

**According to age:** the age of adolescent girls between 12-13 years were 20% (20), 14- 15 years were 30% (30), 16-17 years were 30% (30) and 18-19 years were 20% (20) respectively.

**Religion:** In the group, Hindu were 30% (30), Muslim were 13% (13), Christian were 7% (07) and others were 50% (50) respectively.

**Educational status:** In the group, there were 20%(20) girls in 8<sup>th</sup>, 41%(41) were in 10<sup>th</sup> and 39% (39) were in 12<sup>th</sup> respectively.

**Occupational status of the parents:** In the group, 34% (34) were have private job, 20% (20) were have government job, 6% (06) were marketing manager and 40 % (40) were have business and financial operation respectively.

**Living status of adolescent girls:** In the group, 50% (50) were living in rural area and 50% (50) were living in urban area respectively.

**Type of family:** In the group, adolescent girls in nuclear family were 30% (30), in joint family were 50% (50), in extended family were 5% (05) and in single parent family were 15% (15) respectively.

**Monthly family income:** In the group, monthly family income of less than 10000 were 20% (20), 20000-40000 were 40% (40), 50000-80000 were 40% (40) and above 80000 were 0% (0) respectively.

**Type of residence:** In the group, 59% (59) were living in own residence, 30% (30) were living in rented residence, 05% (05) were living in hostel and 6% (06) were living in other residence respectively.

**No. of siblings:** In the group, 35% (35) have 1 sibling, 45% (45) have 2 siblings, 20% (20) have 3 to 5 siblings and 0% (0) have above 5 siblings respectively.

**Age of menarche:** In the group, girls with age of menarche of 10-13 years were 20% (20), girls with age of menarche of 14-17 years were 80% (80) and girls with age of menarche of 18-21 and above 22 years were 0% (0) respectively.

**Duration of menses:** In the group, 11% (11) girls were have 0-3 days of menses, 25% (25) girls were have 3-5 days of menses, 50% (50) girls were have 5-7 days of menses and 14% (14) girls were have more than 7 days of menses respectively.

### Objective II: Findings related to knowledge of adolescent girls regarding prevention and prevalence of anemia.

Majority 58 (58%) of the adolescent girls had inadequate knowledge, 40 (40%) had moderate knowledge and 02 (2%) had adequate knowledge in pre-test before administering structured teaching program. After getting structured teaching program, 15 (15%) of adolescent girls had moderate knowledge and 85 (85%) of adolescent girls had reported adequate knowledge.

#### **Mean, mean percentage and standard deviation for the pre-test knowledge of adolescent girls regarding prevention and prevalence of anemia.**

The mean and mean percentage of pre-test knowledge score of adolescent girls were found to be 10.78 and 35.93% with standard deviation 4.414 which indicates to have inadequate knowledge regarding prevention and prevalence of anemia.

#### **Mean, mean percentage and standard deviation for the post-test knowledge of adolescent girls regarding prevention and prevalence of anemia.**

The mean and mean percentage of pre-test knowledge score of adolescent girls were found to be 24.05 and 80.16% with standard deviation 2.890 which indicates to have adequate knowledge regarding prevention and prevalence of anemia.

#### **Objective III: Findings related to evaluate effectiveness of STP by comparing pre- test and post-test knowledge scores of adolescent girls regarding prevention and prevalence of anemia.**

The table 13 it is evident that the obtained “t” value of 25.554 is more than the table value at 0.05 level of significance. Therefore “t” value is found to be significant. It means there is gained in knowledge level of adolescent girls regarding prevention and prevalence of anemia. This supports that structured teaching program on prevention and prevalence of anemia is effective in increasing the knowledge level of adolescent girls.

#### **Objective IV: Findings related to association of pre-test knowledge scores of adolescent girls with selected demographic variables.**

All demographic variables are not significant at 0.05 levels except type of residence ( $\chi^2=25.951$ ,  $df=6$ ) which is significant at 0.05 level. Thus, it can be inferred that there is significant association between knowledge levels of adolescent girls regarding prevention and prevalence of anemia and demographic variables. Therefore, the hypothesis stated there will be significant association between pre-test knowledge level of adolescent girls regarding prevention and prevalence of anemia and selected demographic variables is accepted.

## **6. SUMMARY**

Anemia is a condition in which the number of red blood cells or the amount of haemoglobin is low. Red blood cells contain haemoglobin protein that it enables them to carry oxygen from the lungs and deliver it to all parts of the body. When the number of red blood cells is reduced or the amount of haemoglobin in them is low, the blood cannot carry an adequate supply of oxygen. An inadequate supply of oxygen in the tissues produces the symptoms of anemia (Gupta and Kochar, 2009). Adolescence has been defined by the world health organization as the period of life spanning the ages between 10 to 19 years (WHO, 2017). This is the formative period of life when the maximum amount of physical, psychological, and behavioural changes take place.

The adolescent girls play an important role in the prevention of anemia. This chapter provides the process employed in this the study. The primary aim of the study was to assess the knowledge of adolescent girls regarding Prevention and Prevalence of Anemia.

#### **THE PRESENT STUDY WAS AIMED TO ACHIEVE THE FOLLOWING OBJECTIVES**

- To assess the pre-test knowledge regarding anemia among the adolescent girls.
- To assess the post-test knowledge regarding anemia among the adolescent girls.
- To assess the effectiveness of structured teaching program between pre-test and post-test level of Knowledge Regarding Prevention and Prevalence of Anemia among Adolescent Girls.
- To find out association between pre-test knowledge regarding anemia with their selected demographic variables.

#### **THE FORMULATED HYPOTHESES WERE:**

**H1-** There will be significant difference between the mean pre-test and post-test knowledge regarding Prevention and Prevalence of Anemia among the adolescent girls receiving Structured Teaching Program (STP).

**H2-** There will be significant association between pre-test knowledge scores of adolescent girls with their selected demographic variables.

#### **CONCEPTUAL FRAMEWORK**

The conceptual model selected for this study was based on Imogene king’s goal attainment theory is based on the personnel and interpersonal systems including interaction, perceptions, communication, transaction, stress, growth & development, time and action.



The research approach used for this study was experimental approach, which is adopted for one group pre-test and post-test design.

**Independent variable:** In this study, the structured teaching program is the independent variable.

**Dependent variable:** In this study, knowledge score of adolescent girls regarding Prevention and Prevalence of Anemia is the dependent variable:

**Demographic variables:** Demographic variables in this study were Age, religion, education, occupation status of family, type of family, and Monthly family income etc. The setting of the study was in selected areas of Mohali, Punjab. The purposive sampling technique is to draw the samples. The sample size is 100.

## THE TOOL CONTAINS 2 PARTS

**Part-I:** Structured schedule seeks information about socio-demographic variable.

**Part-II:** Structured knowledge questionnaire is used to assess the knowledge of adolescent girls regarding Prevention and Prevalence of Anemia.

Experts provided content validity of the tool and it is found to be reliable and feasible during the pilot study. The main study was conducted from in selected areas of Mohali, Punjab. The investigator established good rapport with the adolescent girls and got the consent. The data regarding socio-demographic variables and knowledge of the adolescent girls was collected and administered the structured teaching program to adolescent girls, the post-test is taken after intervention with STP. The knowledge level was assessed by structured knowledge questionnaire. The data were analysed and interpreted in terms of sections formulated, descriptive and inferential statistics were used.

The findings of the study have been discussed with reference to the sessions, hypothesis and with the findings of the other studies. The revealed that the difference in knowledge level is 44.23% by using structured teaching program. This showed that structured teaching program was effective in increasing knowledge of the adolescent girls hence research hypothesis was accepted. On the basis of the findings, the investigator concluded that the simulated instructional module which was administered was effective. The association of post-test level of knowledge with demographic variables using chi-square test revealed that there was no significant association.

## MAJOR FINDINGS

Majority 58 (58%) of the adolescent girls had inadequate knowledge, 40 (40%) had moderate

knowledge and 02 (2%) had adequate knowledge in pre-test before administering structured teaching program. After getting structured teaching program, 15 (15%) of adolescent girls had moderate knowledge and 85 (85%) of adolescent girls had reported adequate knowledge.

The mean and mean percentage of pre-test knowledge score of adolescent girls were found to be 10.78 and 35.93% with standard deviation 4.414 which indicates to have inadequate knowledge regarding prevention and prevalence of anemia.

The mean and mean percentage of pre-test knowledge score of adolescent girls were found to be 24.05 and 80.16% with standard deviation 2.890 which indicates to have adequate knowledge regarding prevention and prevalence of anemia.

It is evident that the obtained “t” value of 25.554 is more than the table value at 0.05 level of significance. Therefore “t” value is found to be significant. It means there is gained in knowledge level of adolescent girls regarding prevention and prevalence of anemia. This supports that structured teaching program on prevention and prevalence of anemia is effective in increasing the knowledge level of adolescent girls.

All demographic variables are not significant at 0.05 levels except type of residence ( $\chi^2=25.951$ ,  $df=6$ ) which is significant at 0.05 level. Thus, it can be inferred that there is significant association between knowledge levels of adolescent girls regarding prevention and prevalence of anemia and demographic variables. Therefore, the hypothesis stated there will be significant association between pre-test knowledge level of adolescent girls regarding prevention and prevalence of anemia and selected demographic variables is accepted.

## 7. CONCLUSION, IMPLICATION AND RECOMMENDATIONS

Anemia is one of the most universally prevalent diseases in the world today. Iron deficiency anemia is the most common micronutrient deficiency. WHO studies show higher rate in developing countries. The iron deficiency anemia is common 52 % of pregnant women and about 35-40% of non-pregnant women.<sup>1</sup>

Anemia is caused by inadequate supply of dietary iron is the most prevalent nutritional disorder in the United States and the most common mineral disturbances. Almost 16% of lower income children are anemic.<sup>2</sup>

Nutritional anaemia is one of India’s major public health problems. The prevalence of anemia range

from 33% to 89% among pregnant women and is more than 60% among adolescent girls.<sup>3</sup>

Based on the findings of the study, there was an association between the knowledge level and demographic variables of the adolescent girls. Therefore, the investigator felt that it was necessary to improve the knowledge level and signify the role. Structured teaching program has been prepared to increase the awareness of the adolescent girls regarding prevention and prevalence of anaemia.

### IMPLICATION OF THE STUDY

The findings of the study have implications for nursing education, community health practice, nursing practice and nursing research.

**Nursing education** To enhance the knowledge level on prevention and prevalence of anaemia among adolescent girls is an important aspect of the basic education programmes in nursing. The primary task of nursing education would be to intervene in curriculum.

### Nursing practice

An implication for the nursing practice is derived from the study is that occurrence of poor handling of delivery, poor antenatal care of the mother, poor health status of the children and preventing the factors associated with it can prevent for anaemia and its prevalence. Therefore, nurse must receive adequate preparation and training on various practices optimum that would help them to impart knowledge of the adolescent girls.

### Community Health Practice

The result of the study is useful in planning the health care and actions. The community health department can take preventive measures by including periodic growth and development of adolescents as a part of the community nutrition programme especially in areas where there is prevalence of anaemia and other nutritional disorders.

### Suggestions

1. The health professionals should conduct Nutrition programme in the community areas and community health centers.
2. Adolescent girls should update their knowledge constantly in order to increase their care practices in prevention of anaemia and other nutritional disorders.
3. All children's government hospitals, nursing homes and other multi-speciality hospitals should have resource material on prevention of anaemia among adolescent girls.

4. Training for all adolescent girls in schools and community areas should be provided regarding prevention of anaemia.

### RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the findings of the present study and keeping in mind the limitations of the study, the following suggestions are offered to conduct the studies on

1. Knowledge for the adolescent girls regarding other nutritional disorders along with anaemia prevention
2. Comparative study on the prevalence and prevention practices of anaemia among rural and urban areas
3. Assessing the effectiveness of video assisted program/ SIM on anaemia among adolescent girls.

### LIMITATION

Prevention is better than cure. In this study, only adolescent girls from selected areas were selected. Generalization would have been possible if the adolescent girls from the different areas were included in the study. An increased sample size and duration of the study would allow an evaluation of the effect on STP.

### SUMMARY

This chapter brought out the various implications and also has provided suggestions for future studies. Studies of this kind should be an ongoing process to make adolescent girls aware of the importance of prevalence and prevention of anaemia.

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