INTRODUCTION
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Adolescents occupy an abiding place in moulding the future of any community. The word ‘Adolescence’ comes from the Latin word ‘adolescere’ which means to grow. Teenage, which includes 13 to 19 years, is generally equated with adolescence, but in the view of Elizabeth (2000) 10-19 years are included in adolescent period. Thus the period of adolescence spreads almost decade.

Adolescence as defined by Vasanthakumari and Obulesu (2003) is a distinct period of rapid physical, psychological and social behavioural changes in boys and girls. This is an age in which one matures physically, psychologically and socially from childhood to adulthood (WHO, 1998). Neuroscientists have recently offered a rather technical explanation of adolescents’ characteristics. Their experiments revealed that the teenage brain is yet to mature completely. Dhawan (2003) defined adolescence as an age of identity formation. It is a stage where fears, apprehensions, anxieties and misgivings develop. Jayanthini (2000) also stressed the psychological dimension of this period by stating that intense readjustment to the self, family, school, work and social life needs to be made during this stage. Other striking characteristics of this age as stated by Nayar (1995) are ego, anxiety, idealistic or moralistic dependence on friends, hostility to parents, mood change, intolerance to rejection, interest in opposite sex, fads and mob
reaction. Adolescence is at one and the same time demanding, yet promising, extremely exciting yet unsettling.

For Devadas and Jaya (1996) adolescence is a process rather than a period, a process of achieving the desirable growth, attitudes, beliefs and methods for effective participation in society as an emerging adult.

As far as the physiological changes are concerned adolescence is a time when there is rapid increase in the hormones secreted by the pituitary gland in the brain. During this period the ovary and testes increase in size and become functionally mature and secondary sex characters like breast, hair in the armpit and external genital organs develop (Chattopadhyay, 2001).

During adolescence 20-25 per cent of adult stature and 50 per cent of adult bone mass is gained. Females tend to grow more rapidly between 12 and 14 years of age while males experience rapid growth between 14 and 16 years of age as reported by National Institute of Nutrition (NIN) (1999). During this rapid growth period, calorie and nutrient needs are higher to provide for increases in bone density, muscle mass and blood volume and the developing endocrine system. Hence nutrition is a major health issue for adolescents. The nutritional needs of adolescents are unique and demand special attention. Primarily the building and maintenance of new body tissues and demands of a high order of physical activities condition these requirements whether the increased need for the nutrients is met in mostly decided by the food habits of adolescents (Chaudari et al. 2000).
Food Habits during Adolescence

The self conscious nature of adolescents tends to develop in them faulty eating habits like having too much of junk foods, aerated drinks and skipping meals. Such characteristics of adolescence have associated nutritional problems which may lead to delayed puberty, a problem associated with reproductive maturation (Nair, 2001).

During adolescence certain environmental and psychological changes may also adversely affect food habits. For example, society’s emphasis on slimness may cause the adolescent, especially females, to skip meals or drastically reduce calorie and nutrient intake to maintain a low body weight. With the need to adjust to the school and college time the first meal is either scanty or omitted entirely which is a hazard from the nutritional point of view. If children buy candy and soft drinks in the place of regular food they get only 'empty' calories. These foods reduce or dull the appetite without meeting the body’s need. This could result in marginal or low intake of some vitamins and minerals.

Need for acceptance among peer group is another factor forcing adolescents to forgo sound eating practices in order to confirm to peer standards. Likewise, access to spending money is another factor which influences adolescents' diet pattern. Fast food outlets are a common lure to this population which is also a major cause for malnutrition among adolescents (Nair, 2001).
Effect of Malnutrition on Adolescents

In the view of Chaturvedi et al. (1996) adolescents undergoing rapid growth and development are one of the nutritionally vulnerable groups who have not received the attention they deserve.

Malnutrition, especially, anaemia is common among adolescents in under developed and developing countries (Singh, 1998). Anorexia nervosa and obesity are the major malnutrition problems that occur mostly in the wealthier countries and in the upper and middle socio-economic groups (Srilakshmi, 2000).

Nutritional anaemia, a condition characterized by extremely low haemoglobin level in the blood is prevalent among school aged children in India has been estimated as 50 per cent (Saibaba, 1998) and among the non pregnant adolescent girls as 40 per cent (Shatrugana, 1998). Kamalamma et al. (2001) also found that among all the severely anaemic adolescents most were girls. Jaishree et al. (2001) remarked that adolescence is a phase of growth and a considerable per cent of adolescent is found to have low birth weight and less weight and less height as compared to the standard values.

The overall rates of malnutrition among children and women are high. Ethnographic literature suggests that females are not fed as well as males in northern India (Harris, 1986; Miller, 1981). Studies in Uttar Pradesh and
Tamil Nadu all indicate that female children are discriminated against when it comes to the allocation of food within households (World Bank, 1996).

In poor households, pressure on young girls to earn begins at an early age. Persistent nutritional deprivation often keeps such girls from growing properly, resulting in small, malnourished women who often give birth to low-birth weight babies (Ghosh, Bhargava and Moriyama, 1982).

The Government of India is implementing a number of intervention programmes related to control of nutritional deficiencies and disorders such as Vitamin A prophylaxis programme, mid day meal programme, control of iodine deficiency disorder and anaemia prophylaxis programme. One of the weakest links in the intervention programmes is the absence of proper nutrition education (Vijayalakshmi, 2002). Nutrition education could increase nutrition knowledge which has been shown to bring about better understanding of nutrition facts. Corley et al. (1990) stated that nutrition education is beneficial for removing the common misconception related to food intake. Hence, for improving the nutrition and health of adolescents education is essential.

**Importance of Reproductive Health**

Another area which is as important as nutrition is reproductive health of adolescents. As per the sample registration system, the maternal mortality rate in Kerala is only less than 1 (per 1000 live births) since long time. However, information on reproductive health is totally lacking among adolescents. Not many studies have been conducted in Kerala (Pati, 2002) in
this aspect. The prevalence of Reproductive Tract Infection (RTI) and other gynaecological disorders is very high which results in a greater disease burden for women (World Bank, 1996). Reproductive tract infection can be caused by insanitary practices during menstruation and cervical cancer occurs most often after child bearing years. The emergence of HIV/AIDS and prevalence of STDs more than ever stresses the importance of reproductive health.

The 1997 global adolescent health statistics show that 5,90,000 adolescents aged 15 years are newly infected with HIV/AIDS. HIV is spreading at a faster rate of 8 fold in Asia. Heterosexual women and adolescents are the next targets for AIDS epidemic by 2025 (The World Bank, 1996).

World Health Organization (1992) reported that the journey of poor RCH begins from poor genital hygiene during adolescence. It then proceeds to RTI in the reproductive years and increased precedence of Low Birth Weight (LBW). Finally it ends in pre term deliveries.

Recent data from a community based study in India stated that reproductive tract infections were very common even in a rural traditionally Hindu Village (Barg et al. 1989). The leading causes of morbidity were menstrual problems (33-59% of the respondents), excess discharge (22-57%) followed by low backache (5-39%) (Luthra et al. 1992). Added to it there is the problem of sexual exploitation of young girls and even minors in and around
their household (Shenoy and Shenoy, 1999). All these call for guidance of adolescents in sexual matters.

Many micro level studies on the nutritional and health status of the target population report that the modern adolescent, despite the influence of mass media, is left out with no one to rely upon to have proper guidance in the adoption of nutrition as well as health behaviour. As adolescents mature and become sexually active they face serious health risks but have insufficient access to appropriate information guidance and health care services.

Need for Nutrition and Reproductive Health Education

As for the fulfilment of the need for correct sexual information is concerned, Jeejeebhoy (1996) stated that the need for sexual and reproductive health services remain unmet. Therefore the service should be structured so as to respond to these needs taking into consideration the cultural, economic and social constraints.

Many educationists as well as psychologists recommend that adolescents should be given adequate information and guidance on reproductive health needs. Although some are under the impression that for today’s adolescents nothing is left to learn about sexual maturation; actually they are likely to have a lot of confusions and misconceptions in this regard (Umadethan, 1998). In this connection, Suriakanthi (1997) remarked that adolescents who do not have proper sex instruction may suffer from too much of sexual excitement, erotic night dreams and day dreaming. She also
suggested that the content of sex education may include nocturnal emission, menstrual hygiene, venereal diseases and AIDS.

The number of adolescents is another compelling factor necessitating education. As reviewed by Indira (2001) adolescents account for 22.8 per cent of Indian population as on 1st March 2000. This implies that 230 million Indians are adolescents representing the age group of 10-19 years. According to World Health Report (1999) the current generation of 10-19 year olds are more than a billion and will be the largest generation in history to make the transition from childhood and adulthood. With an estimated 1 billion adolescents alive today, the world is experiencing the largest adolescent population in history. As a result, adolescent reproductive health has become an increasingly important component of global health as reported by the Allen Guttmacher Institute, New York.

The reproductive health decisions these young people make today will affect the health and well being of their countries and of the world for decades to come. Adolescents have the right to have clear and accurate information about reproductive health and how to reach a health care provider were the areas much discussed in the International Conference on Population and Development (ICPD).

The data on adolescents’ nutritional status and health care coverage indicate that youngsters are not receiving adequate nutrition and health care, especially, those living in rural areas. According to a study conducted by Kerala Shastra Sahithya Parishad (KSSP) in rural Kerala, among 10000
households, as high as 83 per cent of the households knew about the Primary Health Centre; but only 39 per cent households reported that they were going there for health care. For acute illness only 23 per cent used government health facilities as quoted by Shenoy (1999).

According to World Health Report (1999) health and nutrition education provided for all segments of the population will improve the Human Development Index (IHDI).

Krishnamswami (2000) reported that lack of awareness regarding nutritional needs and paucity of information also aggravates PCM, anaemia and other micro nutrient deficiencies. Therefore, knowledge based nutrition intervention programmes are very much needed.

Rigid dietary habits need correction and only the systematic nutrition education programmes can bring changes in dietary habits. Sensible dietary advice is the only solution.

There are various agencies like health professionals, schools and community organizations which are entitled to impart nutrition education programme. According to WHO (1994) health education helps pupils to achieve health by their own action and efforts. Many aspects of personal hygiene and reproductive health can be achieved by self effort within the resources of the family. However, adolescents easily accessible in a given size through schools, can make an enormous positive impact on the health of the nation (Fettle, 2001). A study conducted by Singh (1995) among school children found that pre intervention analysis of attitude towards nutrition
showed that majority had neutral attitude towards consumption of locally available food materials. After the intervention, remarkable changes were observed with none having unfavourable attitude towards the consumption of green leafy vegetables. So school based nutrition and health education is quite essential. Nutrition and health messages disseminated in school based intervention programmes might reach the parents too.

Shah (1993) stated that in some schools the health department is already taking anthropometric measurements of the pupils. The data thus collected as a ‘school nutrition census’ will provide valuable information for geographical and social targeting and long term monitoring of nutrition intervention programmes.

Statement of the Problem

The forgoing discussion brings out the importance of adequate information and guidance in nutrition and reproductive health. For maintenance of good health, the adolescent’s mental, physical and social well being should be brought to equilibrium or homeostasis. They should be tuned to a sweet rhythm. In India it is highly important to address the educational needs of adolescents because a large proportion of adolescents particularly in rural areas get married and enter into parenthood at an early age. The practice of early marriage is seen even in the so called progressive state such as Kerala where one in five girls were married before reaching age 18 years (Pati.2002).
Many researchers agree that dissemination of nutrition knowledge especially, the applied aspects to the school children will help them to develop desirable food habits. Educational programme is one of the best ways to make adolescents to be aware of facts regarding nutrition and health (Hussain, 1995).

In order to decide the content of such dissemination programmes to the target population, it is essential that knowledge and attitude in nutrition and reproductive health should be assessed. By and large, assessment studies relating to the level of knowledge and attitudes of rural adolescents on reproductive health are not so many. Keeping this in view, the present investigation, namely, “Determinants of Nutrition and Reproductive Health Cognition among School Going Rural Adolescents” was undertaken.

Significance of the Present Study

The primary focus of the present study was the knowledge level and attitudinal nature of rural adolescents towards nutrition and reproductive health. The study was carried out among selected school going rural adolescents of a particular geographical area for formulating suitable intervention strategies.

The study was conducted in Kazhakuttom Block of Thiruvananthapuram District, capital of Kerela State, where earlier surveys done by a team of researchers of Thiruvananthapuram Medical College reported the incidence of low birth weight babies. The predisposing factors of this incidence were found as poor adolescent nutrition status, anaemia during
pregnancy and maternal height less than 140 cm and weight less than 40 kg which is much less than the standard parameters. This finding brought to light the need for further probe on whether lack of knowledge was basic to the problem in the selected study area. So it was considered essential that their knowledge and attitude on nutrition and reproductive health assessed for the formulation of nutrition and health education programmes. Hence the primary focus is to study the adolescents' nutrition and health cognition. The study also provides an education intervention model which could be replicated for better knowledge, behaviour and attitude towards nutrition and reproductive health.

Reliable nutrition information like 'germinated pulses will provide vitamins and minerals at zero cost' as well as misconceptions like consumption of eggs will lead to the formation of pimples should be brought to the reach of school children in order to correct their food beliefs which in turn would lead to the use of locally available nutritious food stuffs.

Similarly, age appropriate authentic information on sexuality can help the young people who are not already sexually active to delay the onset of sexual activity and maintenance of reproductive health system in the right manner (Birdthistle and Whitman, 1997).

The findings of present study when passed on to the intervention programme participants will benefit their parents too. Generally parents, particularly those in rural areas are not aware of the nutritional needs of the growing adolescents and hence fail to meet them. The knowledge on nutrition
and the positive attitude towards nutrition passed on through the education intervention to their youngsters may bring nutrition improvement in the future generation too.

Reproductive health education efforts made in the present study will benefit the participants to acquire correct information regarding their reproductive biology as well as management of their maturation processes.

Also the findings of the present study should be useful for the educators to formulate similar models of teaching-learning packages for the dissemination of authentic information to adolescents.

**Scope of the Study**

The scope of the study is restricted to school going rural adolescents. The reason for selecting rural adolescents was that the problem of these school children was reported as much more deplorable than the urban children.

As the primary focus of the study was the knowledge level and attitudinal nature of rural adolescents towards nutrition and reproductive health an attempt was made to find out the relationship between age, sex, religion, type of family, birth order, maternal education, maternal employment, family income, source of information, type of school and nutrition cognition as well as reproductive health cognition. The major research questions posed by the study were:
1. What is the knowledge level and attitudinal nature of school going rural adolescents in nutrition and reproductive health aspects?

2. Which variables are related to their knowledge and attitude?

3. In which specific areas do they need information? and

4. What may be a model of an intervention programme to be offered to rural adolescents in nutrition and reproductive health?

In order to find answers to these problems, the researcher first of all set out to identify the independent and dependent variables. According to Best and Khan (2000) the independent variables are the conditions or characteristics that the researcher selects in his or her attempt to ascertain their relationship to observed phenomena. The dependent variables are the characteristics that appear or change as the researcher introduces or changes independent variables. After identifying the variables, they were operationally defined to ensure clarity of concepts and validity of the study. After clearly defining the different variables, the hypotheses to be tested were formulated.

These steps helped the researcher to be very specific about the kind of measuring instrument to be developed for assessing the nutrition cognition and reproductive health cognition.
Objectives of the Study

The general objective was to explore adolescents’ knowledge and attitude towards nutrition and reproductive health issues. The study also intended to determine which of the variables were related to or influencing rural adolescents’ knowledge and attitudes towards nutrition and reproductive health.

Specific Objectives

The study had the following specific objectives:

1. to determine the knowledge level of selected school going rural adolescents on nutrition and reproductive health,

2. to describe the attitude of the sample of the study towards nutrition and reproductive health,

3. to identify areas of deficiency in nutrition and reproductive health knowledge among the sample,

4. to identify variables influencing the respondents’ knowledge and attitude towards nutrition,

5. to identify variables influencing the respondents’ knowledge and attitude towards reproductive health and
6. to determine the effect of an education intervention programme on the knowledge gain and attitudinal change of selected subjects towards nutrition and reproductive health aspects.

Hypotheses Tested

Based on the objectives, the following relevant null hypotheses were formulated to test the relationship between independent variables and dependent variables.

1. There is no relationship between the selected independent variables such as age, sex, religion, type of family, ordinal position, maternal education, maternal employment, family income, type of school and sources of information and the dependent variable, namely, nutrition knowledge of rural adolescents.

2. There is no relationship between the selected independent variables and dependent variable, namely, attitude towards nutrition among rural adolescents.

3. There is no relationship between the selected independent variables and the dependent variable, namely, reproductive health knowledge of the rural adolescents.

4. There is no relationship between the selected independent variables and the dependent variable, namely, attitude towards reproductive health among the rural adolescents.
5. There is no interrelationship among the selected key dependent variables, namely, nutrition cognition and reproductive health cognition.

6. No significant knowledge gain or attitudinal change can be effected by an education intervention programme.

Definition of Concepts

The major concepts used in this study were defined as follows:

Conceptual Definitions

**Nutrition Cognition.** The definition given by Hoorweg and Niemeijer (1989) that nutrition cognition is a combination of nutritional knowledge and nutritional attitude was the conceptual meaning given to the term in the present study.

**Reproductive Health.** The definition given by Rao (1997) for reproductive health was adopted as conceptual definition for this study. According to him reproductive health deals with sexuality in the context of biological and reproductive dimensions.

Operational Definition of Concepts

The concepts for the purposes of this study were operationally defined as follows:
Nutrition Cognition was operationally defined as the scores obtained by the respondents on a Knowledge test and on a Nutrition Attitude scale developed for the purpose.

Reproductive health cognition was operationally defined as the knowledge scores and attitude scores obtained by the respondents on a Knowledge Test and on an Attitude Scale.

**Limitations of the Study**

As this study was a single researcher investigation undertaken as a part of the requirements for a doctoral degree programme it has all the limitations of time, finance and other resources. These limitations restricted the selection of study locale and also forced to restrict the sample size.

In spite of fixing appointments with the heads of schools selected, the interview session could not be held at the expected pace because of their non-availability at the time of visit or their busy schedule. In many cases a minimum of two-three visits were needed to complete the data collection exercise. Despite these limitations it is expected that the findings of this study would certainly provide definite clues in evolving suitable teaching-learning modules meant specifically for rural adolescents.

Since the study is based upon the expressed opinions of the respondents, it may not be free from personal bias and prejudice. However, every effort was made by the researcher to carry out the study as systematically and sincerely as possible.
Delimitation

The study focused only on the rural adolescents. Since the universe did not include urban population, comparison could not be done. Similarly the study excluded non school going adolescents.

Presentation of the Report

The report of the study is presented in five chapters; the first chapter deals with introduction, where the statement of the problem, objectives, scope and limitations and delimitations of the study are discussed. The second chapter covers the review of literature and studies related to the investigation. The third chapter deals with the design of the study followed by presentation of findings and its discussion in the fourth chapter. Chapter five gives the summary and conclusions of the study followed by bibliography and appendices.