CHAPTER V
SUMMARY AND CONCLUSIONS

This chapter gives a brief description of the objectives of the study, hypotheses set for the study, methodology in brief, major findings, conclusions and suggestions made for future research and recommendations arising out of the findings of the study.

Adolescence, a period of transition between childhood and adulthood, occupies a crucial position in the life of human beings. Good health during adolescent period leads to good health during reproductive years. Nutrition surveys have indicated high prevalence of nutritional deficiencies during adolescence. They also have brought out the fact that nutritional deficiencies during adolescence would lead to consequences in later years including sexual maturation delays and final adult height.

An aspect which is as important as nutrition in adolescence is reproductive health. In India it is highly important to address the reproductive health needs of the adolescents because a large proportion of adolescents particularly in rural areas get married and enter into parenthood at an early age.

In this context, educational programme is one of the best ways to encourage adolescents to be aware of facts regarding nutrition and health. For providing education to the target population, it is essential that their cognition which comprises knowledge and attitude should be assessed.
Keeping these factors in view, the present investigation, namely, “Determinants of Nutrition and Reproductive Health Cognition among School Going Rural Adolescents” was undertaken. The study was designed to determine the level of nutrition and reproductive health cognition among selected school going rural adolescents in a particular geographical area for formulating suitable intervention strategies.

Objectives

The present study explored rural adolescents’ knowledge and attitude towards nutrition and reproductive health issues. The study addressed the following research questions:

1. What is the knowledge and attitude 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?

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.

**Variables**

The two key dependent variables studied were nutrition cognition and reproductive health cognition of school going rural adolescents. These dependent variables were quantified using two knowledge tests and two attitude scales. Validity of the tools was ensured through a pilot survey and reliability of the tools was found out using the split half method.

On the basis of review of literature and expert opinion, ten independent variables were selected for the study and they were age, sex, religion, type of family, birth order, maternal education and maternal employment, family income, sources of information and type of school.
Hypotheses Set for the Study

Based on the objectives and assumptions, relevant null hypotheses were formulated which were as follows:

1. There is no relationship between the selected independent variables such as age, sex, religion, type of family, birth order, maternal education, maternal employment, family income 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 sample studied.

4. There is no relationship between the selected independent variables and the dependent variable, namely, attitude towards reproductive health among the sample studied.

5. There is no inter relationship 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.
Methodology

Type of research used in this study is a descriptive one. It provides information on the knowledge level and attitude of selected school going rural adolescents on nutrition and reproductive health. The study also describes an intervention programme that was formulated on the basis of the background information collected as well as its conduct and its effectiveness in improving the knowledge and attitude.

Subjects of the Study. The subjects of the study were 505 school going rural adolescents. The subjects of the intervention study were 64 sixteen year old adolescents who underwent the education intervention programme as part of the study. The subjects were selected from a population of 26850 school going rural adolescents of Kazhakuttom Block of Thiruvananthapuram District in Kerala State. Multistage sampling method was used for the selection of the sample.

Tools for Data Collection. The tools used for data collection included:

1. A questionnaire to elicit information on the socio economic background of the families of the rural adolescents and their personal characteristics which consisted of 14 questions.

2. One knowledge test each for determining the knowledge level of the rural adolescents on nutrition and reproductive health.

3. An attitude scale each to describe the attitude of the rural adolescents towards nutrition and reproductive health aspects.
Construction of the Tests and Seales. The initial battery for developing knowledge test consisted of 35 items. The knowledge test items were given three answers, right, wrong and no idea. Every right answer was given a score 1, wrong response 0 and the no idea response was given minus one. The total scores for each respondent were thus calculated and item analysis was done by computing the item difficulty index and item discrimination index. The developed knowledge test on nutrition consisted of 20 items and reproductive health test consisted of 24 items along with 8 questions regarding personal hygiene and 8 questions on health care practices. Similarly, the attitude scales prepared for measuring the nutrition attitude as well as attitude towards reproductive health aspects were subjected to item analysis.

The statements for construction of the two attitude scales were collected through a pilot survey. The relevancy of the statements was tested by circulating the list of statements to 30 experts (10 school teachers, 10 health professionals, 10 nutritionists). The responses were collected on a four point continuum of Very Much Relevant (VMR), Much Relevant (MR), Some what Relevant (SR) and Not Relevant (NR). The scores given were 4, 3, 2 and 1 for VMR, MR, SR, NR respectively. The total score for each statement given by the expert was calculated. The statements were ranked in descending order of their scores. From this 20 statements each with a high score were selected and subjected to item analysis. Items with good discrimination values were selected.

The statements were administered randomly to 100 school going rural adolescents who were not included in the main study. They were asked to respond to each statement in terms of their own agreement or disagreement on a
five point continuum such as strongly agree, agree, undecided, disagree and strongly disagree. The various responses were assigned numerical weightage varying 5 (strongly agree) to 1 (strongly disagree) for positive statements. For negative statements the order was reversed. The total score was the summation of numerical weight assigned to each response.

To evaluate individual statements, the critical ratio that is ‘t’ value which is a measure of the extent to which a given statement differentiates between high and low group respondents was calculated. The statement with highest t value that is more than 1.75 was selected. The nutrition attitude scale thus constructed consisted of 12 positive and 12 negative statements.

A knowledge test on reproductive health was adapted from the one developed by National Population Education Project (NPEP) under National Council for Education Research and Training (NCERT, 1990) with necessary modification. The test consisted of 24 items on reproductive health, 8 questions regarding personal hygiene and 8 questions on health care practices. Same procedure as was followed for the construction of Nutrition Knowledge Test was followed here also.

**Education Intervention Programme**

As part of the study an intervention programme was planned to evolve modules of teaching-learning in the areas of nutrition and reproductive health. The education intervention programme was implemented on a selected sample who had secured low knowledge scores in the main study.
In none of the eight schools from which the total sample was drawn efforts were taken to implement Adolescence Education Programme. To conduct an education programme as part of the study, a course material was prepared. The content of the course material included mainly the areas where knowledge gap was identified in the main study.

The prepared course material was evaluated by five subject experts to assess the suitability of the programme. The finalized course material was pre tested. The intervention was imparted only to the experimental group consisting of 39 boys and 25 girls. Single group pre test - post test design was adopted for the implementation of intervention programme. Group teaching method was followed by dividing the Intervention Study Sample (ISS) into eight groups each consisting of eight members.

The education intervention was carried out once in a week. The course material was given to each group. After one hour discussion on the selected unit of the module with in the group, all the eight groups joined together for further deliberation in the presence of the researcher. Reading material prepared in the vernacular language was also distributed to the participants for home study. The implementation of the intervention was done over a period of 5 months.

**Analysis of Data**

The collected data were analysed using statistical tests such as ANOVA and Multiple Classification Analysis besides Measures of Central Tendency (mean), Measures of Variability (standard deviation), ‘t’ test and Pearson’s Product Moment Correlation technique.
Major Findings of the Study

Socio-Economic and Personal Characteristics

A large majority of the sample was 15 year old and was from nuclear families. Regarding birth order, majority of the respondents were first born. As for educational status, majority of the respondents’ parents studied upto high school level. Majority of the sample belonged to middle socio-economic status.

Nutrition Cognition

Majority of the sample under study was familiar with the term balanced diet. Both boys and girls had poor scores on the different aspects of nutrition such as nutritive needs, food groups and nutritive value of food stuffs. It was found that nutrition knowledge scores of girls was higher than boys where as the boys had higher favourable attitude towards various nutrition aspects.

Majority of the sample reported that television and radio as their prime source of information for knowing about nutrition.

Based on the scores obtained by the sample in the attitude scale it was found that majority of the sample had neither favourable nor unfavourable attitude towards the importance of good nutrition, food habits and nutrition education. It was also found that there was significant variation in the nutrition cognition of boys and girls.
Reproductive Health Cognition

Majority of the sample had medium level knowledge only. A good percentage of girls were not aware of growth spurt and pubertal changes. It was also found that considerable percentage of girls was not aware of the menstruation details prior to attainment of menarche and they felt it as an unpleasant experience. On comparison it is found that more per cent of girls were aware of STD / HIV / AIDS than boys. The most accessible source of information regarding reproductive health aspects was found friends and peer group only for both boys and girls. However knowledge of reproductive health aspects of boys was relatively poor.

Majority of the sample, both boys and girls, did not have favourable attitude towards pubertal changes, as well as sex education. It is found that sex is an important determinant of attitude towards reproductive health but not the reproductive health knowledge level of the sample.

Personal Hygiene and Health Care Practices

Majority of the respondents were practising personal cleanliness in a moderate way only and there was no significant variation between boys and girls. Regarding health care practices it was found that boys fared better than girls. There was significant difference between adolescents studying in government and private schools in observing personal hygiene. Regarding health care practices too, the private school students had higher mean score and the difference was significant.
Relationship among Dependent Variables of the Study

There was significant correlation between nutrition knowledge and nutrition attitude, reproductive health knowledge and reproductive health attitude. Significant correlation was also found between reproductive health knowledge and nutrition knowledge; reproductive health knowledge and nutrition attitude; reproductive health attitude and nutrition knowledge; reproductive health attitude and nutrition attitude; of the rural school going adolescents. There was significant correlation among all the dependent variables among the two sexes too.

Relationship between Independent Variables and Dependent Variables

Selected independent variables such as age, birth order, maternal education, maternal employment, family income, sources of information and type of school influenced the nutrition cognition of the girls under study.

With regard to boys, the independent variables afore said showed insignificant influence on their nutrition cognition except for family income. Selected independent variables such as birth order of the boys and the type of school studied were the only two variables which showed significant influence on reproductive health cognition among boys. Results revealed that no one of the selected independent variables influenced the reproductive health cognition among girls.

The multiple classification analysis results showed that two or more selected independent variables when taken together was found to explain to a considerable percentage on the nutrition and reproductive health cognition of the study sample.
it was found that sex and source of information such as television viewing and extra reading habits when taken together found to explain 24 per cent variation on nutrition knowledge.

Similarly, the selected five variables, namely, sex, religion, family income, type of school and sources of information such as newspaper, magazine and radio were found to explain 34 per cent variation on the respondents' attitude towards nutrition.

Nineteen point fifty per cent of the variance of reproductive health knowledge is explained by three variables, namely, type of school, religion and source of information such as newspaper and radio when taken together.

Likewise the selected five variables, type of school, sex, presence of family members other than parents, family income level, television viewing and radio listening behaviour of the school going rural adolescents when taken together were found to explain 29.30 per cent variation on their attitude towards reproductive health.

**Findings Emerged from the Intervention Programme**

Most of the ISS were from Hindu religion and there were equal number of representation from the forward castes as well as backward castes. Half of the sample were first born and majority belonged to nuclear families. The computed BMI values showed that half of the sample was moderately under nourished.

There was significant knowledge gain as well as attitudinal change in nutrition and reproductive health aspects among the ISS. From the difference in the mean scores obtained during pre and post intervention, it was found that the
education intervention was an effective one. It was also found that girls benefited much by the intervention. But there was an overall increase in knowledge among boys and girls in the feed back.

Tenability of the Hypotheses

This survey research attempted to explain the determinants of nutrition and reproductive health cognition by setting hypotheses stating that there was no relationship between the selected independent variables and the dependent variables. The study results confirmed that the assumption was valid with regard to boys. The ANOVA test results showed insignificant influence on nutrition cognition with all the selected independent variables such as age, birth order, maternal education, maternal employment, sources of information and type of school except family income in the case of boys. With regard to girls, ANOVA test results revealed that independent variables such as age, birth order, maternal education, maternal employment, family income, sources of information and type of school influenced the nutrition cognition. Multiple classification analysis results reveal that the nutrition and reproductive health cognition of the study sample was influenced by not only predictable variables but also by some unknown factors. Hence the null hypotheses No. 1, 2, 3 and 4 were rejected.

Karl Pearson’s Product Moment Correlation results showed significant interrelationship between nutrition knowledge and nutrition attitude, reproductive health knowledge and reproductive health attitude, nutrition knowledge and reproductive health knowledge and nutrition attitude and reproductive health attitude of the school going rural adolescents. Therefore the fifth null hypothesis stating that there is no inter relationship between the selected four dependent
variables, namely, nutrition knowledge, nutrition attitude, reproductive health knowledge and reproductive health attitude can also be rejected.

On the basis of mean score difference between pre and post intervention tests it was found that significant knowledge gain on nutrition and reproductive health aspects took place among the ISS. According to the results of this study the intervention programme was found an effective one in disseminating nutrition and reproductive health messages. Hence the sixth hypothesis stating there would be no significant knowledge gain or attitudinal change can be effected by, an education intervention programme was also rejected.

Conclusions

Based on the findings it may be concluded that the knowledge level of rural adolescents in the areas of nutritive needs of adolescents, nutritive value of foods, functions of food, nutritional deficiencies, method of cooking without nutrient loss, health status assessment, physical growth spurt, sexual maturation, personal hygiene and health care practices were relatively poor. The high school curriculum on nutrition provides only theoretical orientation. The applied aspects of nutrition is not included in the science text books. So clarity in the concepts of applied nutrition was lacking among the sample studied. It may be concluded that there is need for increased advocacy among the rural adolescents to develop conceptual clarity regarding various nutrition and reproductive health aspects. This can be materialized by the formation of school based health counseling centres. Regular visits of health professionals to this centre will provide the chances for the adolescents who are in need to confide with the authorized person.
An important conclusion that can be drawn from the intervention programme was that the structured dissemination of knowledge like the one done in the present study as a co-curricular activity would have a positive impact on raising the levels of knowledge in the area of nutrition and reproductive health. It was also observed that both boys and girls, invariably, gained knowledge and had favourable attitudinal change towards nutrition and reproductive health uniformly which indicate that the course material was appropriate for the level of students. The findings may be helpful to the health professionals, teaching community and policy planners engaged in nutrition teaching as well as Health Information Management System (HIMS) to frame appropriate strategies. The findings may also help in generation of location specific IEC materials.

Suggestions for Future Research

Considering the fact that the present study was conducted in a particular part of Kerala, it is suggested that an in-depth study regarding nutrition as well as reproductive health cognition among rural adolescents throughout the entire state of Kerala may be taken to frame guidelines related to learning content as well as teaching-learning strategies in nutrition and reproductive health specially suited for rural adolescents. Multiple replication of the intervention using the course material formulated in different regions as well as social settings can provide information concerning the extent to which the intervention’s effectiveness in improving the knowledge on nutrition and reproductive health of the rural adolescents. Likewise, effects of nutrition knowledge dissemination on adolescent eating behaviour can also be studied.
The education intervention programme implemented in the present study may be replicated at different field settings will provide indications concerning the degree to which the intervention’s impact can be generalized. Studies on non school going adolescents’ nutrition and reproductive health cognition are also suggested.

Study on the effect of dietary habits and intake on age at puberty in selected rural girls can be done for prescribing dietary regimen for rural mothers to be.

Research studies can be taken up on the dietary adequacy and nutrition awareness with the anthropometric measurement correlates in order to prevent nutritional deficiencies during the growing years.

Content analysis of the existing IEC materials is to be done to determine the extent of effective coverage of the targeted population. It is also suggested, based on the content analysis results, to undertake adolescent friendly new IEC projects.

Recommendations

On the basis of the experience of the implementation of the education intervention, the researcher recommends that the health professionals are the apt persons for the dissemination of nutrition and health messages. It is also recommended to conduct sessions on reproductive health separately for boys and girls.
The researcher herself observed the school children’s hesitance to interact freely during the group teaching session in the presence of their teachers. So it is recommended that the health professionals may be given full responsibility to disseminate nutrition and reproductive health messages to the adolescents who can easily be approached through school based health intervention programmes.

Nutrition and health teaching should be done in non-curricular approach with ample scope for innovative teaching-learning activities like quiz contest, essay competition / painting / poster competition and value clarification through role play and case study. This will provide an effective linkage which is lacking currently in the exchange of information among the various levels of Health Management Information System (HMIS) in the government health departments.