RESEARCH DESIGN
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The methodology pertaining to the study on “Educational Intervention Programme To Empower School Going Adolescent Girls On Their Reproductive and Nutritional Health” is discussed under the following headings:

3.01 Statement of the problem
3.02 Study area
3.03 Population of the study
3.04 Research type
3.05 Variables of the study
3.06 Sampling
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3.08 Module development
3.09 Training of teachers
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3.16 Operational definition for selected significant terms used in the study
3.17 Limitations of the study
3.01 Statement of the problem

Caught in the web of transition from childhood to adulthood, the adolescents are most acutely affected and get trapped into various health problems. Adolescence is a critical period during which significant growth occurs. The suddenness and rapid pace, with which the changes take place in the body of adolescents, generate a number of problems related to their health.

Adolescents appear to be poorly informed with regard to their own reproductive and nutritional health. Whatever knowledge they have it is moreover incomplete and confused. As a consequence adolescent girls are vulnerable to health risks and face more health problems like anemia, reproductive tract infections, teenage pregnancies, etc.

According to the Nutrition Foundation of India, the average age of menarche is 13.4; yet 50 per cent of girls aged 12-15 years do not know about menstrual hygiene and preventable menstrual problems. Lack of information can be attributed to a veil of secrecy that surrounds menarche.

For adolescent girls in India, poor nutrition, and early childbearing and reproductive health complications compound the difficulties of adolescent physical development. Knowledge on nutrition among adolescents is poor and most girls are not adequately aware of their increased nutritional needs for growth, especially about increasing their food intake to meet caloric demands of pubertal growth, resulting in underweight and short stature.

In India, school systems are ambivalent about reproductive health education. Even in some schools where reproductive health education exists in the curriculum teachers are often too embarrassed and feel uncomfortable to give effective instruction. Nutritional aspect during adolescence is also less focused. Many school girls develop poor eating habits and suffer from many nutritional deficiencies.
Hence in this context, a study focusing on School going Adolescent girls on their Reproductive and Nutritional Health was felt necessary. With the aim of increasing their awareness on reproductive and nutritional health, the present study titled “Educational Intervention Programme to Empower School Going Adolescent Girls on Their Reproductive and Nutritional Health” was undertaken.

3.02 Study area

The present study was conducted in private and government schools of Pondicherry, a Union Territory. Pondicherry lies in the east coast of Tamilnadu. It has an area of 492 square kilometer and population of 10.89 lakhs as per census, 2008. The study was conducted in Pondicherry because no such study to create awareness among school going adolescent girls regarding their reproductive and nutritional health was conducted prior to the present study. Prevalence of misconception and lack of awareness regarding adolescent reproductive health among adolescent girls was reported in a study by Narayana et al (2001) in Pondicherry. At present there is no adolescent counseling clinic to cater to the needs of adolescent girls. Since the researcher hails from Pondicherry, familiarity of the place was an added advantage.

3.03 Population of the study

School going adolescent girls of eighth and ninth class from selected six higher secondary schools both private and government in Pondicherry constituted the population of the study. Girls who were interested in educational intervention on ARH and ANH were included as experimental groups. Girls not willing for educational intervention but were interested in assessing their knowledge, attitude and practice on ARH and ANH were included under the control group.
### 3.04 Research type

The present study is an experimental research. Experimental research aims at determining whether and in what manner variables are related to each other [Vijayalakshmi and Sivapragasam, 2008]. In the present study there are two Experimental groups and one Control group. Study design is shown in fig-3.1.

**Fig. 3.1**

**Study design**

**Study population**

- School going adolescent girls
- Students from selected schools from 8th and 9th class

**Sample population**

- Control group (C)
- Experimental group [E]

- Experimental (E1)
- Experimental (E2)

- Pre test - KAP
- Intervention by the Researcher
- Post test - KAP

- Pre test - KAP
- Intervention by the Trained Teachers
- Post test - KAP

**KAP** - Knowledge, Attitude, Practice
3.05 Variables of the study

The study aims to find the impact of educational intervention in different modes to school going adolescent girls on Knowledge, Attitude and Practice on ARH and ANH. Hence dependent variables are outcome of the intervention programme among the respondents in their Knowledge, Attitude and Practice [KAP] on ARH and ANH and independent variables are the mode of intervention programme, one given by the researcher and the other by the trained teachers to school going adolescent girls.

Dependent variable- quantification

- Knowledge on adolescent reproductive health and adolescent nutritional health was quantified by the scores obtained in the knowledge scale on ARH and ANH.
- Attitude towards adolescent reproductive health and adolescent nutritional health was measured using attitude scale containing statements on ARH and ANH and was quantified by the scores.
- Practice followed regarding adolescent reproductive health and adolescent nutritional health was measured using practice scale on ARH and ANH and was quantified by the scores.

3.06 Sampling

‘Cluster Randomized’ sampling method was followed, the units of randomization being schools. Since based on the system of education, two kinds of schools exist, namely, the government and the private schools. Among the stratified schools three government schools and three private schools were randomly selected. From each school, three groups namely - Control, Experimental group 1 and Experimental group 2 were taken as per the students’ interest from class eighth and ninth and it is shown in fig. 3.2.
Fig. 3.2
Sampling
6 Higher Secondary Schools

3 Government schools

3 Private schools

School 1  School 2  School 3
C  E1  E2  C  E1  E2  C  E1  E2

School 1  School 2  School 3
C  E1  E2  C  E1  E2  C  E1  E2

C – Control  E1 – Experimental Group 1  E2 – Experimental Group 2
3.07 Sample size
Since only those girls interested in enriching their knowledge on ARH and ANH framed the study sample, only part of the class population framed the sample size.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Schools</th>
<th>Class Population</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>8th</td>
<td>9th</td>
</tr>
<tr>
<td>1.</td>
<td>Annai Sivagami Govt. Girls higher secondary school</td>
<td>110</td>
<td>173</td>
</tr>
<tr>
<td>3.</td>
<td>Soucilabai Govt. Girls Hr. Sec. School.</td>
<td>72</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8th</td>
<td>9th</td>
</tr>
<tr>
<td>4.</td>
<td>Vivekananda Hr. Sec. School</td>
<td>150</td>
<td>145</td>
</tr>
<tr>
<td>5.</td>
<td>Immaculate Heart of Mary’s Girls Hr.Sec.School</td>
<td>487</td>
<td>493</td>
</tr>
<tr>
<td>6.</td>
<td>St. Patrick’s Hr.Sec.School</td>
<td>138</td>
<td>142</td>
</tr>
</tbody>
</table>

Thus there were 147 girls in the control group, 193 girls in the Experimental group 1 and 202 girls in the Experimental group 2.
3.08 Module development

A module was framed based on the needs identified among school going adolescent girls on ARH and ANH and was used for intervention by the researcher and the teachers.

Situational assessment

A situational assessment was done by using a situational assessment scale [Appendix 1] from fifty school going adolescent girls to know their perceived problems, educational needs and preferred mode of intervention on ARH and ANH. The girls were involved in listing various topics that needed to be focused upon for additional information on ARH and ANH. The students were supplemented with ‘free-listing’ in which the adolescent girls were encouraged to list out the problems they faced related to their reproductive and nutritional health and their desire for knowledge regarding their reproductive and nutritional health. These girls were selected from one of the private schools included in the study but were not included either in the Experimental groups or in the Control group of the study.

Module content

After prioritization of adolescent girls’ need on reproductive and nutritional health a module was framed. The lessons have been adopted to suit the Indian culture. The module consisted of eight sessions, four on ARH and four on ANH. Contents of the module on ARH included - growth and development of adolescents, reproductive system, menstruation, conception, sex determination and RTI/STD/HIV/AIDS. Contents of the module on ANH included - balanced diet, Adolescents’ nutritional requirements, Adolescents’ eating habits, food fads and major nutritional deficiencies during adolescence. Each session contained objectives, information sheets, illustrations with appropriate exercises [Appendix 2].
Table – 3.2
MODULE – CURRICULUM CONTENTS

<table>
<thead>
<tr>
<th>Session</th>
<th>Core Areas</th>
<th>Objective</th>
<th>Content</th>
<th>Teaching Method</th>
<th>Training Materials</th>
</tr>
</thead>
</table>
| 1       | Growth and development of Adolescents | • To know about growth patterns  
• To develop awareness on the sequence of changes during puberty  
• To identify emotional changes during adolescence  
• To clarify common features of Adolescence | • Adolescence – Meaning  
• Growth patterns during puberty  
• Sequence of changes taking place in male and female during puberty  
• Emotional changes during adolescence. | Dissemination of information with students interaction and involvement | Information sheet  
I.E.C.materials  
Work sheet  
Related exercises |
| 2       | Reproductive system and menstruation | • To introduce the concept of reproductive health  
• To learn about male and female reproductive organs  
• To acquaint students with the process of menstruation and menstrual cycle  
• To enable the students to acquire knowledge on management of menstrual discomfort and on menstrual hygiene | • Importance of reproductive health  
• Male and female reproductive organs-functions  
• Menstruation and the menstrual cycle  
• Management of menstrual discomfort and menstrual hygiene | Dissemination of information with students interaction | Information sheet  
I.E.C.materials  
Worksheet  
Related exercises |
<table>
<thead>
<tr>
<th></th>
<th>3. Conception and sex determination</th>
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<tbody>
<tr>
<td></td>
<td>• To acquaint students with the process of ovulation and fertilization</td>
</tr>
<tr>
<td></td>
<td>• To familiarize them about pregnancy sign and symptoms and essential needs during pregnancy</td>
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<tr>
<td></td>
<td>• To enable them to know the risks of adolescent pregnancy.</td>
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<tr>
<td></td>
<td>• To make them know about sex determination.</td>
</tr>
<tr>
<td></td>
<td>• Ovulation, fertilization and implantation</td>
</tr>
<tr>
<td></td>
<td>• Pregnancy, sign and symptoms, essential needs during pregnancy</td>
</tr>
<tr>
<td></td>
<td>• Age of pregnancy and risks of adolescent pregnancy</td>
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<tr>
<td></td>
<td>• Sex determination</td>
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<tr>
<td></td>
<td>Dissemination of information with students interaction and receiving feedback</td>
</tr>
<tr>
<td></td>
<td>Information sheets I.E.C.materials Related exercises</td>
</tr>
</tbody>
</table>

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<tr>
<th></th>
<th>4. RTI, STD, HIV/AIDS</th>
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<tbody>
<tr>
<td></td>
<td>• To raise an awareness on RTI</td>
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<tr>
<td></td>
<td>• STD</td>
</tr>
<tr>
<td></td>
<td>• HIV/AIDS</td>
</tr>
<tr>
<td></td>
<td>• RTI – causes – Preventive measures.</td>
</tr>
<tr>
<td></td>
<td>• STD, symptoms, types, preventive measures.</td>
</tr>
<tr>
<td></td>
<td>• HIV/AIDS- signs and symptoms, mode of Transmission / Diagnosis – prevention</td>
</tr>
<tr>
<td></td>
<td>Dissemination of information with students interaction and receiving feedback</td>
</tr>
<tr>
<td></td>
<td>Information sheets I.E.C.materials Related exercises</td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>5. Balanced diet</th>
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<tr>
<td></td>
<td>• To unable the pupils to understand the importance of nutrition during adolescence</td>
</tr>
<tr>
<td></td>
<td>• To learn about food groups and their function.</td>
</tr>
<tr>
<td></td>
<td>• To learn the skill of planning balanced diet</td>
</tr>
<tr>
<td></td>
<td>• Importance of nutrition during adolescence</td>
</tr>
<tr>
<td></td>
<td>• Food and its function</td>
</tr>
<tr>
<td></td>
<td>• Constituents of balanced diet.</td>
</tr>
<tr>
<td></td>
<td>Dissemination of information with students interaction and involvement</td>
</tr>
<tr>
<td></td>
<td>Information sheets I.E.C.materials Related exercises</td>
</tr>
</tbody>
</table>
|   | Adolescents’ nutritional requirement | To familiarize students with the nutritional requirements of adolescent  
  - To enable them learn about components of a healthy diet food items for an adolescent. | Nutritional requirements of calories, proteins, vitamins, minerals for adolescent.  
  - Food items for a healthy diet | Dissemination of information with students interaction and involvement | Information sheet I.E.C.materials Related exercises |
|---|--------------------------------------|------------------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| 7. | Adolescents’ eating habits and food fads. | To know different patterns eating behavior among adolescence.  
  - To help them to identify eating disorders among adolescents.  
  - To enable them to learn about healthy eating habits  
  - To acquaint students with different myths regarding foods.  
  - To understand benefits of vegetarian diet.  
  - To explore factors affecting food choices. | Adolescent eating behavior – skipping meals, snacking.  
  - Eating disorders Anorexia Nervosa Bulimia Nervosa  
  - Healthy eating campaign Myths regarding foods  
  - Vegetarian diet  
  - Food choices | Dissemination of information with students interaction and sharing of experience on food habits | Information sheet I.E.C.materials Related exercises |
| 8. | Major nutritional deficiencies during adolescence | To acquaint students with the malnutrition, causes and consequence  
  - To make them understand major nutritional deficiencies | Malnutrition, causes and its consequences  
  - Iron deficiency anemia  
  - Iodine deficiency disorder  
  - Folate deficiency  
  - calcium deficiency  
  - Key message | Dissemination of information with students interaction and involvement | Information sheets I.E.C.materials Related exercises |
3.09 Training of teachers

Training of teachers was organized to develop skills in the teaching methodology of the teachers to teach the module. Totally six teachers were given the training, three from government schools and three from private schools. Training of teachers was organized for two full working days in Vivekananda higher secondary school in Pondicherry. Teachers’ training covered the clarification of the content of the module, usage of illustration and I.E.C materials during intervention.

3.10 Construction of the tools for data collection

Development of questionnaire

A questionnaire was constructed by the researcher to collect the information about personal profile and socio economic background of the respondents [Appendix 1],

KAP scale on ARH and ANH

A scale to determine knowledge, attitude and practice of selected adolescent girls on ARH and ANH was framed and was used both for the pretest and the posttest [Appendix 1].

Knowledge scale

Knowledge scale comprised both objectives and open ended questions on ARH and ANH, twenty five in each based upon the content of the module.
Fig. 3.3

Training of the Teachers
Attitude scale

Likert scale with three points - agree, undecided and disagree was used. Hundred statements which were relevant to the attitude on ARH and ANH were gathered. Twenty school going adolescents (10 girls from 8th class and 10 girls from 9th class) who were not part of the study were asked to indicate their response to each statement by checking the categories of agreement or disagreement or neutral using three point scale.

Score of the responses of each respondent to each item was given using scale value of +1 to -1 for a positive statement and -1 to +1 for a negative one and zero for undecided. The total score of each respondent was obtained by adding their scores they gave for separate statements. 20 statements, which received highest score and 20 statements which received lowest score were selected. The highest score was taken as criterion groups. Mean scores for each statement among the high scores and the low scores were calculated. Significance of difference between the item mean of the high score group and that of the low-score group was calculated with the help of calculating the ‘t’ value. The items which had the greatest ‘t’ value were retained. From 100 statements only 40 statements which had high t’ value were selected. Thus there were 20 statements on ARH and 20 statements on ANH [Appendix 1].

Practice scale

Practice scale contained objective type questions which could elicit information regarding practices adopted by the respondents regarding ARH and ANH. There were ten questions on ARH and ten questions on ANH [Appendix 1].

Validity of the tool

Content validity of the tool was obtained. The questionnaire KAP scale was validated as appropriate for age and culture by health professionals, school principals, school teachers and experts on adolescent education who are already working with adolescents. All of them had recommended the tool.
Reliability of the tool

The reliability of the tool was established by using test-retest method. Twenty respondents [who were not the part of the study] were chosen and asked to fill the KAP scale twice with a gap of two weeks, between the first and second administration. Karl Pearson’s ‘r’ was computed for finding out the reliability. The co-efficient of correlation, ‘r’ was found to be 0.98 which indicates that tool was highly reliable.

Pretest study

In order to test the practicability of the tool, a pre test study was conducted on fifty adolescent girls who fulfilled the criteria for sample selection. These subjects were excluded from the main study. It enabled the researcher to find out optimum time needed for a respondent to answer the questionnaire and KAP scale. It also helped to identify those items which were vague and ambiguous and they were subsequently removed.

3.11 Ethical consideration

Permission to carry out research in schools was obtained from the Director of school education, Pondicherry. The aims and objectives and the methodology were explained. The Director was helpful and gave the permission. Principals of the schools (under study) were also met personally to get their consent. A written consent from each respondent’s parent was not obtained since the school authorities in all the six schools assured that since this was a part of the school curriculum, it did not warrant securing permission from parents to administer the new curriculum. However, in all the six schools, the school authorities had verbally informed the parents and had not been faced with opposition.
3.12 Data collection-phase 1

Base line survey [Pretest]

A base line survey was conducted before intervention. The data were collected using pretested self-administered questionnaire. After briefing the purpose of the study to the selected school adolescent girls, the questionnaire and KAP scale were distributed. The respondents completed the questionnaire and KAP scale taking one and half an hour. Questions were explained wherever necessary to ensure clarity and care was taken to avoid consultation among students. Though the questionnaire ensured anonymity to the individual student, it included personal identification in the form of initials of names and roll numbers to ensure a pre-post comparison (linking) at individual level.

KAP scales were based upon the content of the module. Scores were allocated to measure the knowledge, attitude and practice of respondents on ARH and ANH. Regarding knowledge and practice scale, each right answer carried one mark and no marks were given for wrong response. Regarding attitude scale-positive statements carried one mark for agree zero for undecided and minus one mark for disagree. For negative statements one mark for disagree, zero for undecided and minus one mark for agree. Higher scores on item reflected right knowledge, attitude and practice. The overall total score of the knowledge, attitude, and practice items was calculated.

3.13 Educational intervention

The educational intervention was carried by two personnel - the researcher and the trained teachers. The module was taught to the selected school going adolescent girls in eight sessions by the researcher and the trained teachers to their respective groups. Each session of educational intervention was for two hours and hence totally sixteen hours were taken for the completion of eight sessions. Four months were taken for the completion of the educational intervention programme.
Fig. 3.4

Educational Intervention by the Researcher
Fig. 3.5
Educational Intervention by the Teacher
All the eight sessions were delivered through structured lesson plans based upon the objectives and content of the module with appropriate teaching materials. The aids used in addition to the blackboard were I.E.C.materials [posters and flipcharts]. Group discussion was conducted wherever necessary.

Students were encouraged to clarify their doubts and misconception; however the use of appropriate teaching aids and teaching methodology was left to the innovativeness of the teachers.

### 3.14 Data collection phase II

**Assessment of the intervention [Post test]**

After educational intervention posttest was conducted in all the six schools for the same respondents with the similar questionnaire and KAP scale as were used for the pretest. After providing necessary instruction to the respondents the test was conducted in the similar format as for pretest. KAP score was calculated in the same pattern as was used for the pretest.

### 3.15 Data analysis

Scores of pretest and posttest were subjected for data analysis. The data was analyzed through the SPSS package, version 15. The mean of total scores were computed. A Paired t-test was applied to detect a statistically significant difference in the mean percentage scores obtained in the pretest and the posttest in all the three groups in knowledge, attitude and practice on ARH and ANH separately. Mean percentage scores as per personal and socio economic backgrounds were calculated and significant difference between scores was found by ANOVA. Correlation coefficient was calculated to find the relationship among the dependent variables - knowledge, attitude and practice on ARH and ANH.
ANOVA was also computed to compare the changes (difference in pretest and posttest means percentage scores] in knowledge, attitude and practice between groups. Tukey test was done to compare between three groups, comparing two groups at a time.

### 3.16 Operational definition for selective significant terms used in the study

**Adolescent girls**

Females in the age group of 10 to 19 years are considered as adolescent girls. Girls of class VIII and IX class in the age groups of thirteen to fifteen years were included in the present study.

**Empower**

This implies enhancing the Knowledge, Attitude and Practice on Reproductive and Nutritional Health towards healthy reproductive life and good nutritional status.

**Adolescent Reproductive Health and Adolescent Nutritional Health**

Important aspects of reproductive health and nutritional health pertaining to adolescents girls were dealt in the study.

**Educational intervention**

Educational intervention means dissemination of information for the respondents based on the content of the module.

### 3.17 Limitations of the study

- Only school going adolescents were taken as respondents. So the results can be generalized only to school going adolescents.
- As focus was placed on female adolescents only, adolescent girls framed the study population.
- Module had been framed to give intervention to students of 8th and 9th classes only.
- Students who were interested for the study constituted the study population.