

CHAPTER V

RESULTS

This chapter deals with the results obtained by the evaluation of Population Education Programme for Secondary School students. The objectives in terms of evaluation of the Population Education Programme were:

1. to find out the gain in knowledge of the Ss in the major areas of Population Education Programme planned.
2. to find out the change in their understanding about the various population issues under study.
3. to find out the extent to which the programme is found suitable and acceptable to both boys and girls and whether there is any difference among them in their acceptance.

Therefore, based on these objectives the results have been presented under the following three sections:

- I. Gain in knowledge of the Ss,
- II. Change in understanding of the Ss, and
- III. Evaluation of the programme by the Ss, headmasters, supervisor and the investigator.

SECTION I

GAIN IN KNOWLEDGE OF THE Ss

The gain in knowledge of the Ss is derived from their responses on the knowledge inventory at the pre-test and post-test. These responses of the total sample for pre-test and post-test were tabulated separately under the four pre-decided categories; i.e., correct, incorrect, do not know and any other responses. There was no response in the fourth category, hence, only three categories were used. In order to get a comparative view to assess the gain in knowledge of the Ss the percentages were calculated for the total sample as well as for boys and girls separately for each of the four areas and the total knowledge inventory on pre-test and post-test. The four major areas under study were demography, determinants and consequences of population growth, human reproduction and family planning. The Table 18 gives the percentages of the responses for boys, girls and total sample on the four major areas of population study and the total knowledge inventory at pre-test and post-test.

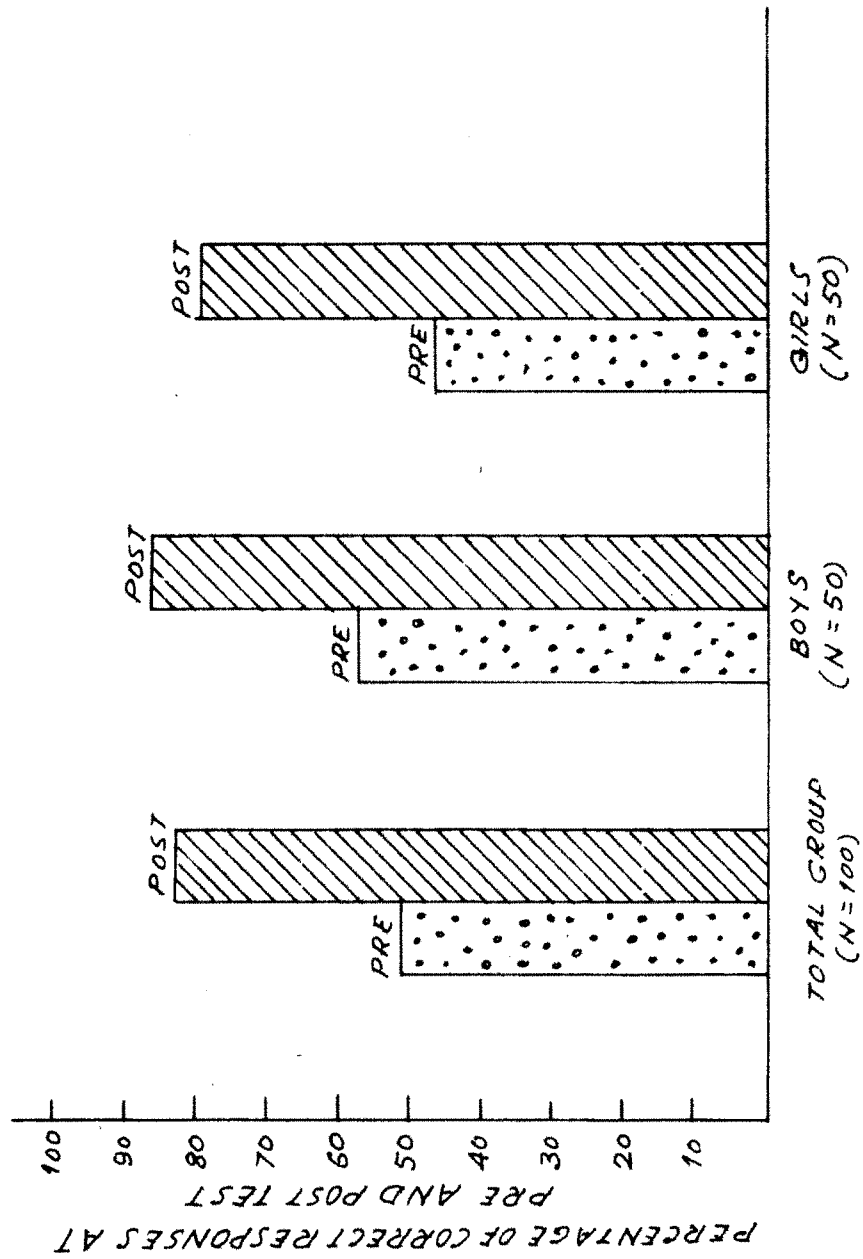


FIG. 9 PERCENTAGES OF CORRECT RESPONSES OF BOYS,
 GIRLS AND TOTAL SAMPLE ON THE TOTAL KNOWLEDGE
 INVENTORY AT PRETEST & POSTTEST

Table 18 indicates that the total sample has 51.0 per cent correct knowledge at the pre-test whereas this has increased to 82.98 per cent at the post-test, thereby showing a net increase or gain in knowledge by 31.98 per cent on the total knowledge inventory.

The sexwise comparison on the total knowledge inventory reveals that the boys have more correct knowledge at the pre-test i.e. 56.64 per cent, as compared to girls at the pre-test level, which is only 45.43 per cent. At the post-test level the percentage of correct knowledge is again higher for the boys, i.e., 86.70 per cent, as compared to girls which is only 79.27 per cent. But, if we consider the gain in knowledge in terms of percentage gain, the girls have gained more than the boys which is reflected by the figures 33.84 per cent and 30.06 per cent respectively (Fig. 9).

The percentages of incorrect and do not know responses of the total sample as well as boys and girls are considerably high at the pre-test level and decreased at the post-test level.

Table 18 also deals with the areawise comparison for the total sample as well as for the boys and girls separately at the pre-test and post-test levels. The total sample shows consistent gain in knowledge in all the four areas of population study. At the pre-test level the total sample has the highest percentage of correct knowledge in

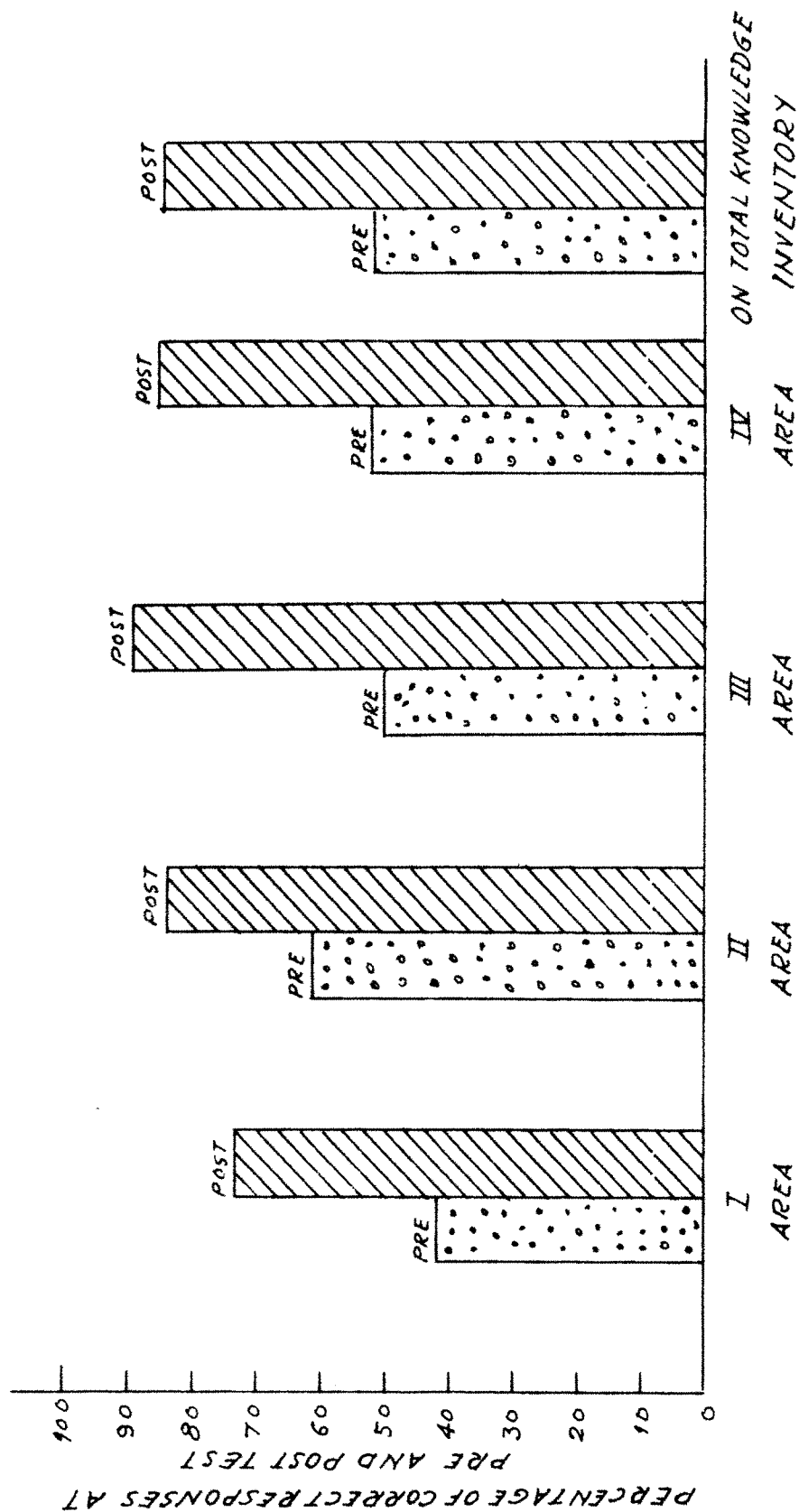


FIG. 10 PERCENTAGES OF CORRECT RESPONSES OF THE TOTAL SAMPLE ON THE FOUR AREAS OF THE KNOWLEDGE INVENTORY AT PRETEST AND POST TEST (N=100)

the area II, i.e. determinants and consequences of population growth, and has least percentage of correct knowledge in the first area, i.e., demography. The post-test figures on correct knowledge for the total sample indicate that the highest correct knowledge is in the area III, i.e., human reproduction and least in the first area, i.e., demography. The figures on difference in percentages reveal that the total sample has gained highest knowledge in the III area which is on human reproduction and has gained least knowledge in the II area, i.e. determinants and consequences of population growth. The same is also graphically presented (Fig. 10).

The sexwise comparison across the four areas of population study reveals that at the pre-test level boys have consistently higher correct knowledge in the four areas as compared to the girls. At the post-test level also the boys have consistently higher percentage of correct knowledge in all the four areas of study as compared to the girls, wherein the difference in the percentage of correct knowledge at the post-test in the area of family planning is very marginal.

On the other hand, if we consider the percentage of gain in knowledge, the boys have gained highest knowledge in the area of human reproduction and the least gain in knowledge in the area of determinants and consequences of population growth. The girls have highest percentage of gain in knowledge in the area of family planning; and the

least gain in knowledge, like boys, in the area of determinants and consequences of population growth.

The sexwise comparison in terms of percentage gain in knowledge reveals that the girls have gained over boys consistently in all the four areas except the one on human reproduction. Further, the girls show a marked gain in knowledge in the area of family planning as compared to boys. At the pre-test level, there is a great difference in the percentage of correct responses of boys and girls in this area but at the post-test level the difference in the percentage of correct knowledge of boys and girls is negligible.

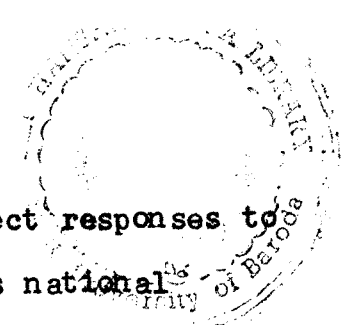
Considering the percentage of incorrect responses of boys and girls there is not much difference in the area on demography as compared to the other three areas at the pre-test as well as the post-test levels.

Taking into account the category of 'Do not know responses' Table 19 indicates that the percentage of do not know responses across all the four areas is higher for girls as compared to boys both at the pre-test as well as the post-test levels.

Table 19 gives the percentage of correct responses at pre-test and post-test for boys, girls and total sample for each statement under the four areas of the knowledge inventory.

Looking at the figures in Table 19 under the first area on demography it is surprising to note that none of the boys and girls knew the correct response to the statement on "most dense district of Rajasthan" at the pre-test. Boys have given only 30 per cent correct response to the statement on the meaning of population density whereas the girls have given zero per cent correct response to the same at the pre-test. In all the statements, except the 1st and 5th, the girls have less percentage of correct knowledge as compared to boys at the pre-test. At the post-test both boys and girls have gained knowledge which is evident from the figures under this area (Table 19). However, the total sample has given only 31 per cent of correct response to the statement on "population of Rajasthan" even at the post-test. Boys as well as girls have given 100 per cent correct responses to the first two statements in this area at the post-test level.

The figures under the area II (determinants and consequences of population growth) reveal that both girls and boys are at the same level of knowledge about most of the statements, both at the pre-test as well as post-test levels (Table 19).



Boys have given 100 per cent correct responses to the statement that the 'family size affects national population' as against 88 per cent correct response of the girls. The total sample has given 30-93 per cent correct responses to the statements in this area at the pre-test which has raised to 71.97 per cent at the post-test, thereby indicating the increase in their knowledge.

In the area III on human reproduction total sample has only 9 per cent correct knowledge about the meaning of menstrual discharge at the pre-test as against 71 per cent of the post-test. Both boys and girls have gained knowledge in this area as the percentage of correct responses range from 74 to 100 per cent for boys and 60 to 100 per cent for girls at the post-test as against 10.86 per cent and 4.88 per cent correct responses respectively at the pre-test.

In the area on family planning the figures reveal that the total sample has 24.38 per cent correct knowledge across the statements at the pre-test whereas at the post-test it has increased to 77.99 per cent. Like area II, in this area also the boys and girls are at the same level in terms of percentages of correct responses at post-test on all the seven statements, thereby showing that inspite of the differences in their knowledge at pre-test, both are at par in their knowledge at the post-test.

The following graphs (Figures 11, 12 and 13) also present the percentages of correct responses at pre-test and

--- POST TEST
 — PRE TEST

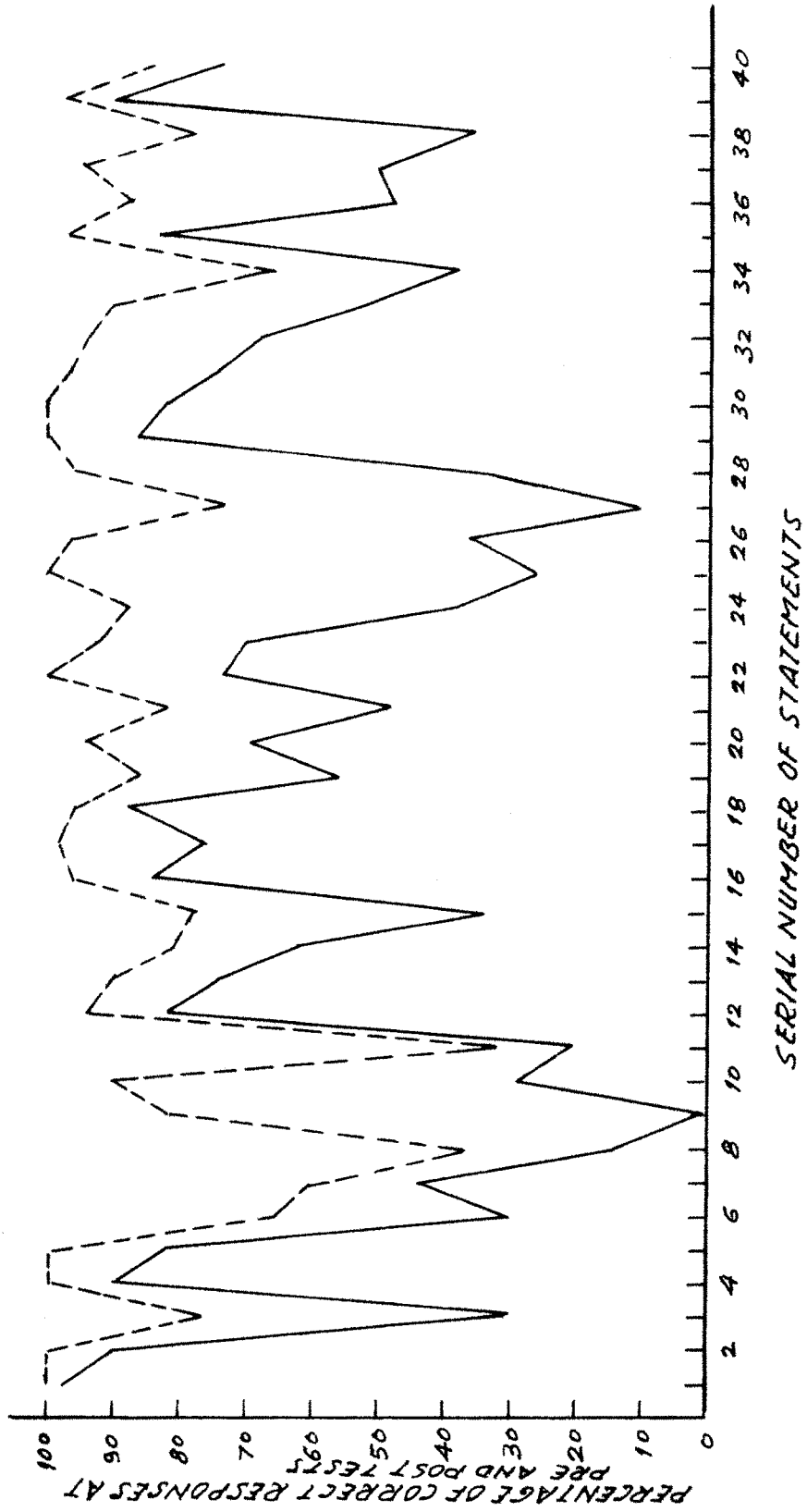


FIG. 11 PERCENTAGES OF CORRECT RESPONSES OF BOYS ON EACH
 STATEMENT OF THE KNOWLEDGE INVENTORY AT PRETEST
 AND POST TEST
 (N = 50)

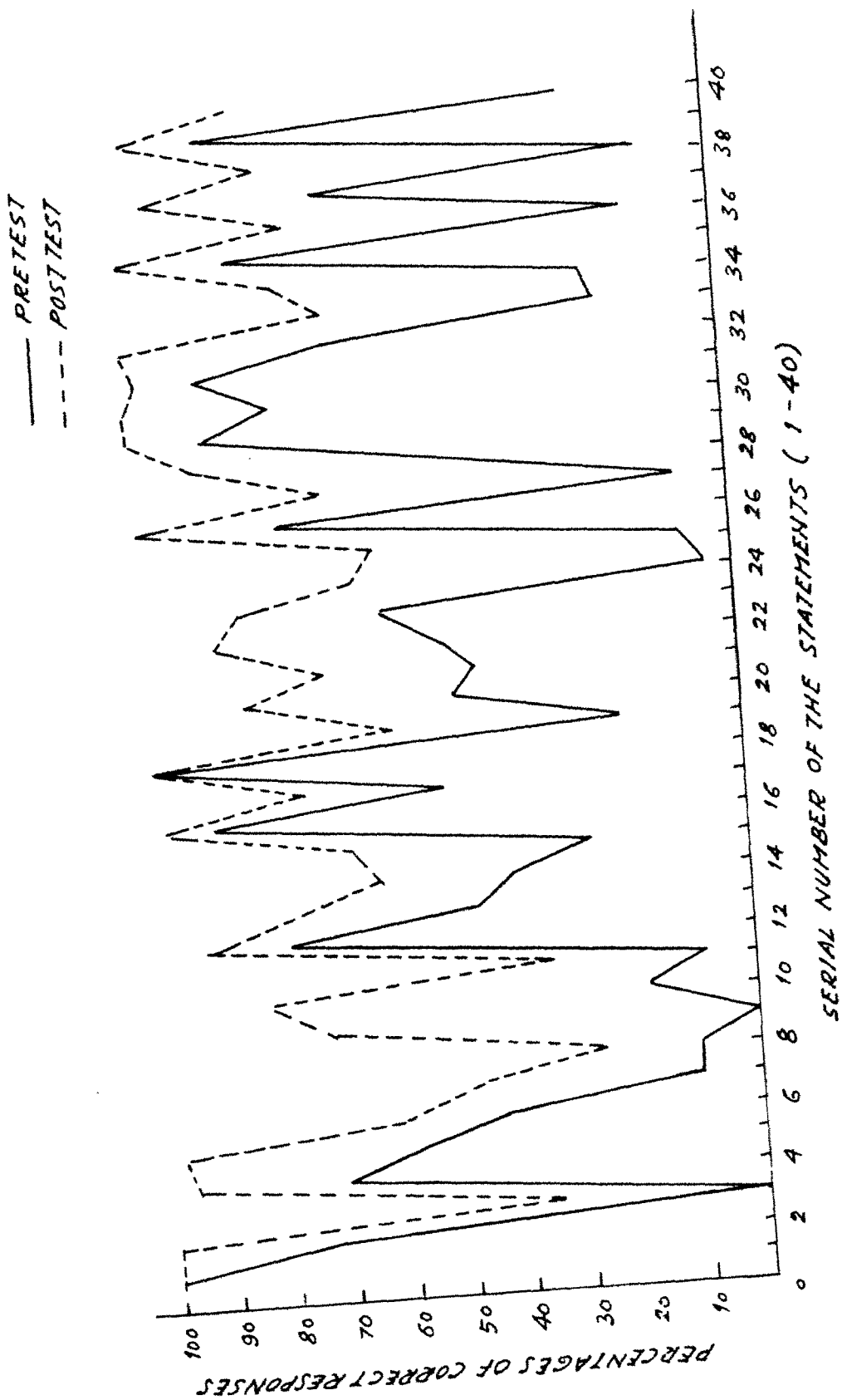


FIG. 12 PERCENTAGES OF CORRECT RESPONSES OF GIRLS ON EACH
 STATEMENT OF THE KNOWLEDGE INVENTORY AT PRETEST & POSTTEST
 (N=50)

— PRE TEST
--- POST TEST

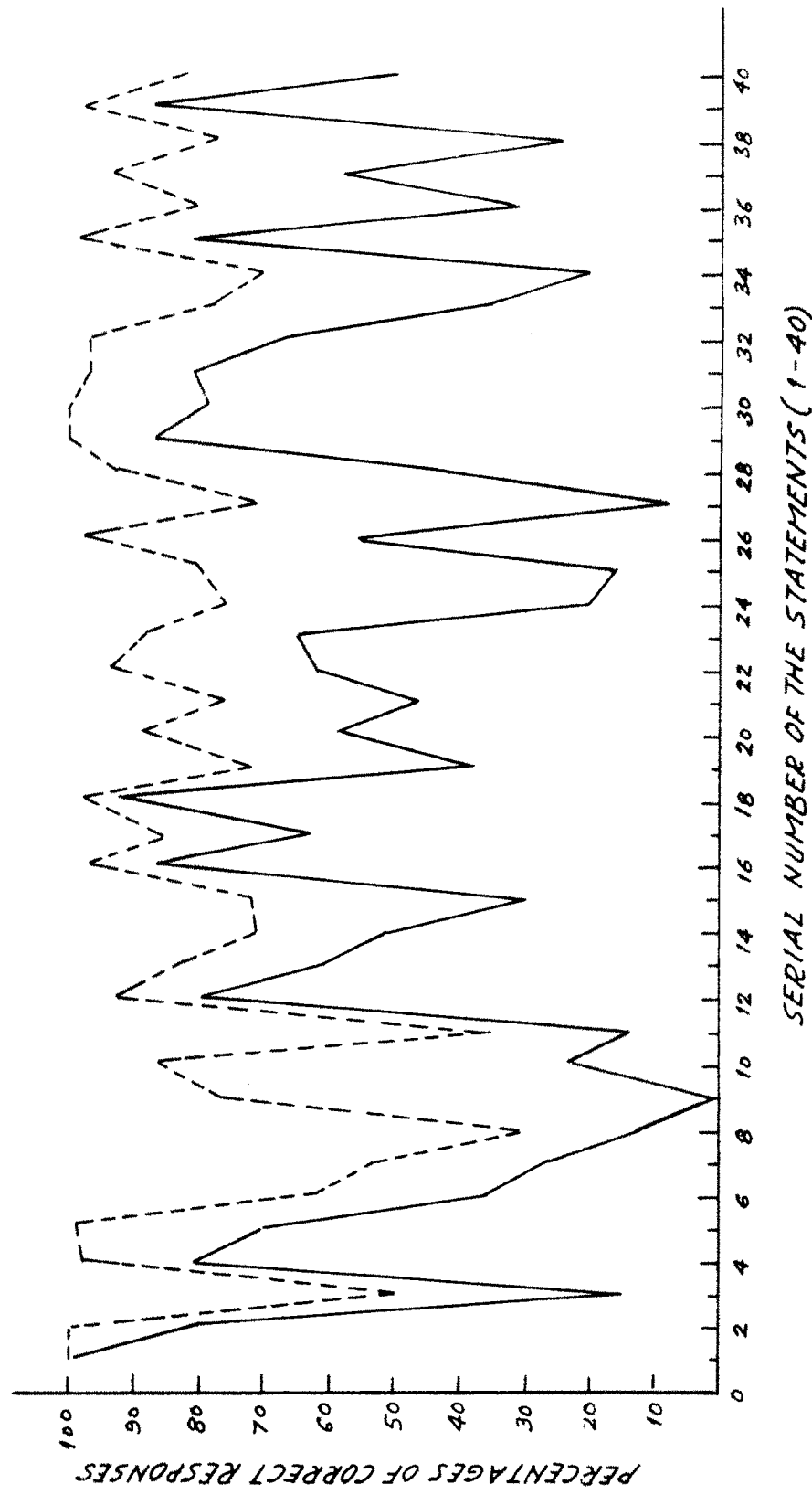


FIG. 13 PERCENTAGES OF CORRECT RESPONSES OF THE TOTAL SAMPLE
ON EACH STATEMENT OF THE KNOWLEDGE INVENTORY AT PRETEST
AND POSTTEST

post-test for boys, girls as well as for the total sample on each of the statements on the total knowledge inventory.

The gain in knowledge by the total sample as well as boys and girls on the total knowledge inventory was further subjected to the test of significance i.e. t-test. Table 20 gives these figures.

Table 20 : t-values of the Gain in Knowledge by the Total Sample as Well as Boys and Girls on the Total Knowledge Inventory

	Total Group (N=100)	Boys (N=50)	Girls (N=50)
Means of the difference (D)	12.58	12.04	13.12
Standard deviations $_1$ = Pre-test	5.33	5.83	3.65
$_2$ = Post-test	3.87	3.14	3.83
Standard Error of the Means =			
M_1 = Pre-test	0.53	0.82	0.51
M_2 = Post-test	0.38	0.44	0.54
Correlation between Pre and Post-tests (r)	0.56	-0.03	0.58
t ratio - Calculated value	28.59*	12.94*	27.33
- Tabulated value at .01 level	2.63	2.69	2.69
df = (degrees of freedom	99	49	49

* Significant at .01 level of significance

Table 20 indicates that the gain in knowledge for the total sample as well as for boys and girls is statistically

significant at .01 level of significance.

The gain in knowledge by the total sample on all the four areas of population education under study (the knowledge inventory) was also subjected to the test of significance (i.e. t-test) and the same is presented in Table 21.

Table 21 : t-values of the Gain in Knowledge by the Total Sample on the Four Areas of Population Education Under Study (N = 100)

	A r e a s			
	I	II	III	IV
Means of the difference (D)	3.39	2.88	3.94	3.28
Standard deviation 1 = Pre-test	1.63	2.20	1.93	1.75
2 = Post-test	1.41	1.88	1.22	1.09
Standard Error of the Means =				
M ₁ = Pre-test	0.16	0.22	0.19	0.17
M ₂ = Post-test	0.14	0.18	0.12	0.10
Correlation between pre and post tests (r)	0.47	0.66	0.11	0.34
t-ratio - Calculated value	15.40*	20.57*	21.88*	23.42*
- Tabulated value at 0.01 level	2.63	2.63	2.63	2.63
df = (degrees of freedom)	99	99	99	99

* Significance at .01 level of significance

Table 21 indicates that the gain in knowledge by the total sample across all the four areas of study is significant

at .01 level of significance.

Besides these, the correcting difficulty indices for chance success of gain in knowledge at the pre-test and post-test levels for boys and girls on all the four areas of population education under study was also calculated to further ensure the test efficiency. This calculation was attempted with an assumption that the corrected value of the difficulty index is, to be sure, an approximation, but it probably gives more nearly true measures than does the experimentally obtained percentage. Table 22 presents these values.

Table 22 : Areawise Comparison Between Boys and Girls on Correcting Difficulty Indices for Chance Success at Pre-test and Post-test

		A r e a s							
		I		II		III		IV	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Gir- ls
Pre- test	Without correction	47.81	35.5	68.17	54.2	50.6	48.4	60.0	43.7
	With correction	58.0	52.0	77.0	67.0	73.0	83.0	55.0	71.0
Post- test	Without correction	79.9	68.0	90.5	79.3	93.4	84.6	86.0	85.1
	With correction	79.0	77.0	92.0	85.0	95.0	90.0	87.0	92.0

Table 22 indicates that the corrected values both at pre-test and post-test are higher than the values without correction except in the area IV for boys. Comparing the

corrected values at pre-test and post-test it is clear that the gain in knowledge is not by mere chance in all the four areas by both boys and girls.

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SECTION II

CHANGE IN UNDERSTANDING OF THE Ss

This section includes the change in understanding of the Ss based on their responses to a set of five story situations presented to them at the pre-test and post-test. These story situations were built around the three major areas of population education, namely, determinants and consequences of population growth, human reproduction and family planning. The area on demography was not included for this (refer Method chapter). The responses of the Ss were rated under the three pre-decided levels of understanding for the pre-test and post-test separately based on an a priori criteria. The mean scores calculated are presented in this section for the total sample, boys and girls at pre-test and post-test levels for these five story situations put together.

Besides this, a comparative picture in terms of the relationship between the knowledge and understanding of the Ss at the pre-test and post-test levels is also drawn in this section. Further, an attempt is made to present the concepts in which the Ss show a very low level of knowledge and understanding at pre-test and post-test as indicated through their responses to knowledge inventory and story situations to specifically know those concepts in which they have not acquired knowledge and understanding even after the experimental teaching.

Table 23 gives the mean scores on level of

understanding for the total sample of boys and girls at pre-test and post-test or the five situations.

Table 23 : Mean Scores on Level of Understanding at Pre-test and Post-test for the Total Sample as Well as the Boys and Girls on the Five Situations

	Situation No.	Boys (N=50)	Girls (N=50)	Total (N=100)
I	Pre-test	1.69	1.98	1.83
	Post-test	3.0	3.0	3.0
II	Pre-test	1.44	1.56	1.50
	Post-test	2.84	2.84	2.84
III	Pre-test	1.42	1.65	1.53
	Post-test	2.82	2.66	2.59
IV	Pre-test	1.28	1.35	1.31
	Post-test	2.44	2.46	2.45
V	Pre-test	1.39	1.56	1.48
	Post-test	2.89	2.77	2.85
Grand Total	Pre-test	1.41	1.58	1.50
	Post-Test	2.77	2.72	2.74

Table 23 shows that the mean score for the total sample at pre-test level is only 1.50 whereas it has increased to 2.74 at post-test level when all the five situations are put together. Thus, it can be inferred that the total sample has increased in its level of understanding.

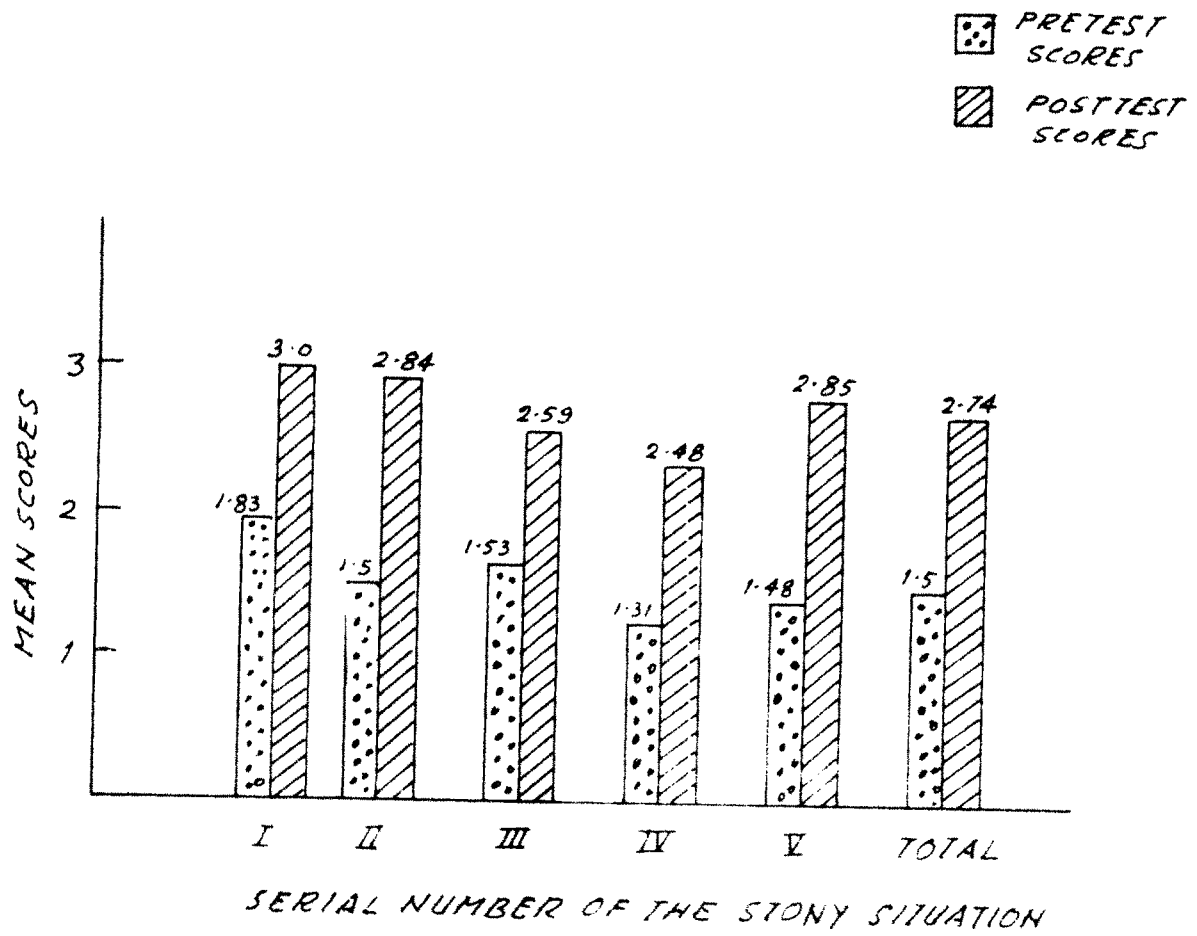


FIG. 14 MEAN SCORES ON LEVEL OF UNDERSTANDING
AT PRETEST AND POSTTEST FOR THE TOTAL SAMPLE
ON FIVE SITUATIONS

The total sample at pre-test level is below the moderate level of understanding (i.e. 1.50 mean score) whereas at post-test level the total sample is close to achieving a full level of understanding (i.e. 2.74 mean score).

The sexwise comparison reveals that the mean score at the pre-test level for boys is lower than that for girls i.e. 1.41 and 1.58 respectively when all the five situations are put together. The mean score at the post-test level is slightly higher for boys than that for girls (i.e. 2.77 and 2.72 respectively). This indicates that the boys have increased in their understanding more than the girls. Further, the mean score for both boys and girls for situation one shows that they are close to achieving a moderate level of understanding at pre-test whereas at post-test both boys and girls have attained the level of full understanding. For other situations also they have shown a considerable increase in their understanding.

Table 24 gives the mean scores on level of understanding at pre-test and post-test for the total sample, boys and girls for each of the questions under the five situations.

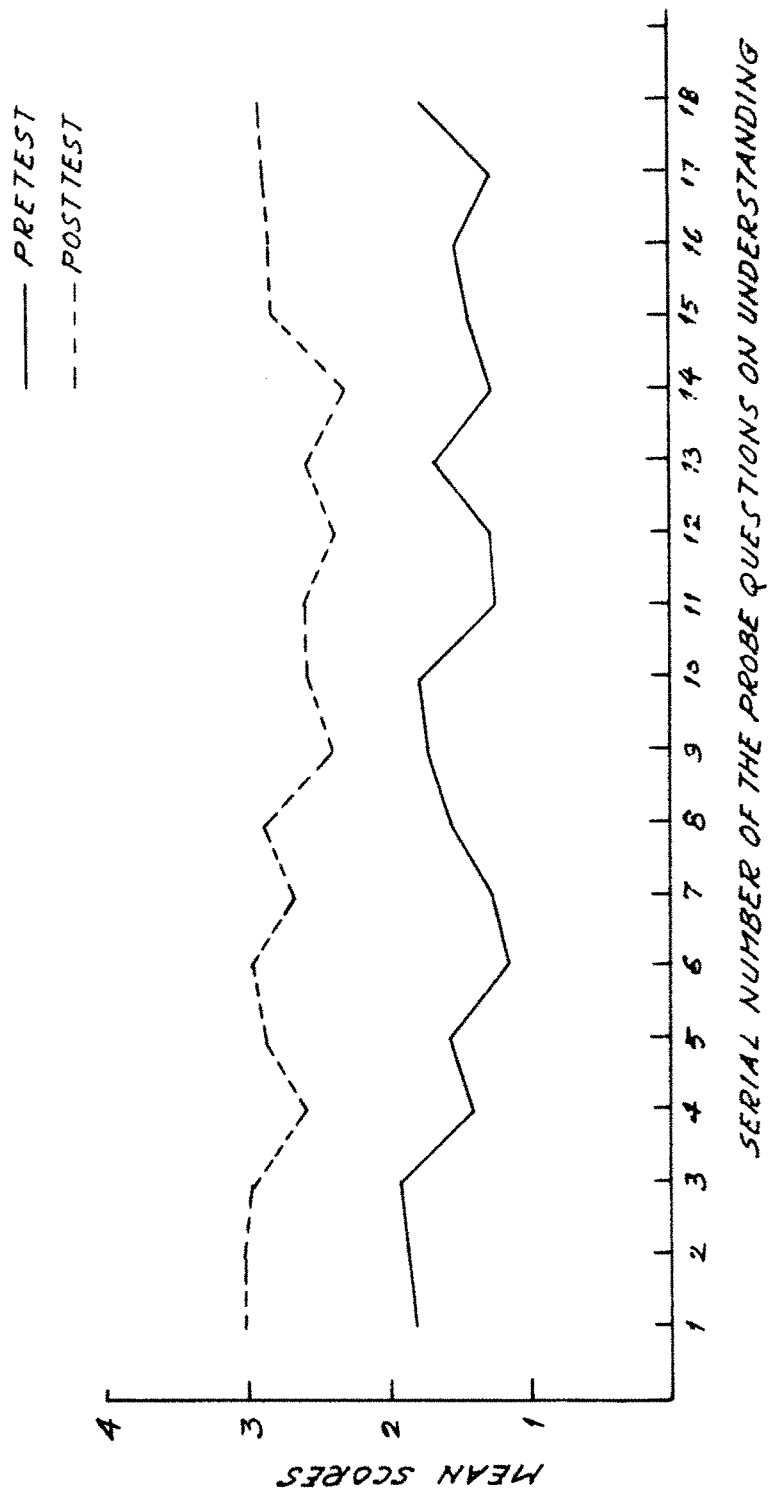


FIG. 15 MEAN SCORES ON LEVEL OF UNDERSTANDING AT PRETEST
AND POSTTEST FOR THE TOTAL SAMPLE ON EACH PROBE
QUESTION RELATED TO THE FIVE SITUATIONS(N=100)

It is evident from Table 24 that the total sample has changed in the level of understanding from pre-test to post-test as indicated through their responses to each of the probe questions related to the five situations. Table 24 further shows that the total sample has reached a full level of understanding on the concepts underlying the probe questions^{one} and two (i.e. under the situation I), whereas for other probe questions also the total sample at the post-test is above moderate level of understanding (i.e. mean score ranging from 2.32 to 2.97 at post-test). The figures 14 and 15 illustrate the mean scores of the total sample on the five situations as well as each of the probe questions under these situations respectively.

The sexwise comparison shows that both boys and girls have increased in their level of understanding at the post-test as compared to the pre-test on all the probe questions across the five situations (Table 24). At pre-test boys show below moderate level of understanding on all the probe questions whereas the girls show less than moderate level of understanding on all the probe questions except two (i.e. probe questions 2 and 3) at pre-test level. At the post-test boys show above moderate level of understanding for all the probe questions except four, i.e. 1, 2, 3 and 8 in which they show full level of understanding. Thus, out of 18 probe questions boys have attained a level of full understanding on 4 probe questions at the post-test. In case of girls also, they have attained a level of full

understanding on 4 probe questions out of 18 across the five situations. These four are numbered 1,2,6 and 18.

The change in understanding for the total sample, boys and girls was further subjected to test of significance (i.e. t-test). Table 25 gives the t-values for change in understanding of the total sample, boys and girls on all the five situations put together.

Table 25 : t-values for Change in Understanding of Total Sample as Well as Boys and Girls on all the Five Situations Put Together

	Total (N=100)	Boys (N=50)	Girls (N=50)
Means of the difference (D)	22.47	22.44	20.50
Standard deviations $_1$ = Pre-test	3.46	3.21	3.06
$_2$ = Post-test	2.35	2.33	2.18
Standard error of the means			
M_1 = Pre-test	0.34	0.45	0.43
M_2 = Post-test	0.23	0.32	0.30
Correlation between pre-test and post-test (r)	-0.12	0.03	-0.33
t-ratio - Calculated value	52.25*	45.25*	34.74*
- Tabulated value at .01 level	2.63	2.69	2.69
df = (degrees of freedom)	99	49	49

* Significant at .01 level of significance

Table 25 shows that the change in understanding of the total sample as well as boys and girls is highly significant at 0.01 level of significance.

Further analysis was attempted by way of calculating Pearson's Product Moment Correlation (r) between the scores obtained on knowledge inventory and story situations at the pre-test and post-test for total sample as well as for boys and girls separately. Table 26 gives the r-values.

Table 26 : r-values Between the Scores Obtained on Knowledge Inventory and Story Situations at the Pre-test and Post-test for Total Sample as Well as Boys and Girls

Sample	r-values at pre-test	r-values at post-test
Boys (N = 50)	+ 0.295	+ 0.135
Girls (N = 50)	+ 0.303	- 0.095
Total Sample (N = 100)	+ 0.069	+ 0.087

.01 level of significance.

Table 26 indicates a positive non-significant correlation (at .01 level of significance) between the scores on knowledge inventory and story situations at both, pre-test and post-test levels for boys and the total sample. In case of girls there is a positive non-significant correlation at the pre-test. At post-test the r-value for girls shows negative non-significant correlation between the two, though the value is very small.

The comparison between the knowledge and understanding of the Ss indicate that the total sample has 51.0 per cent correct knowledge and a mean score of 1.50 out of 3 at the pre-test. This has increased to 82.98 per cent and a

mean score of 2.74 for correct knowledge and understanding respectively at post-test for total sample. This clearly shows that the total sample has increased in their correct knowledge as well as their level of understanding after the experimental teaching.

The sexwise comparison shows that the boys have more correct knowledge at pre-test as compared to girls (i.e. 56.64 per cent and 45.43 per cent respectively). The same is not true for their understanding. The mean score for girls is higher at the pre-test as compared to boys (i.e. 1.58 and 1.41 respectively). At the post-test the percentage for correct knowledge in case of boys is higher than girls (i.e. 86.70 per cent and 79.27 per cent respectively). The mean score for understanding for boys at post-test is higher than that of girls (i.e. 2.77 and 2.72 respectively). This shows that at post-test boys have higher knowledge (or more correct knowledge) and higher level of understanding as compared to girls. But, in terms of gain in knowledge the girls have gained more correct knowledge than boys whereas the boys have attained more understanding as compared to girls after the experimental teaching.

Further an attempt is made to present the concepts in which the Ss show a very low level of knowledge and understanding at pre-test and post-test with a purpose to know those concepts in which they have not acquired knowledge and understanding even after the experimental teaching. These inferences are drawn from their responses

at pre-test and post-test both on knowledge inventory and the story situations. The Ss in general show very low level of correct knowledge as well as understanding at pre-test on the following concepts:

- (a) Means of checking the rapid growth of population.
- (b) The reason for low standard of living in India.
- (c) The religious belief of having a son in the family affects national population.
- (d) Child bearing age of women, and
- (e) Nutritional deficiencies increase in mother and child due to increased number of pregnancies.

Besides these, they also show low understanding at pre-test about the concepts like:

- (a) source of information related to sex,
- (b) both rich and poor should adopt small family, and
- (c) the union of sperm and ovum results in conception.

At the post-test they are able to give correct information regarding these concepts as well as give expected reasons for their responses at the interviews, thereby showing an improvement in the quality of their responses at the post-test i.e. after the experimental teaching.

The following pages aim at describing the improvement

in the quality of the responses of the Ss to each of the five story situations from pre-test to post-test.

Situation I: The responses of the Ss at pre-test reveal that very few of them have been able to visualize the various consequences of migration like increase in:

- housing problem,
- problem of children's education,
- employment problem,
- health problem, and
- other problems related to environmental pollution.

At the post-test they are able to foresee and list all these problems. Besides this at pre-test many of them responded in terms of Yes/No only whereas at post-test they have given logical reasons for their responses. At post-test all Ss have attained full level of understanding for this situation.

Situation II: The responses of both boys and girls to this situation reveal that they lack conceptual clarity.

In case of boys at pre-test some feel that the boy/girl should not get married at that age whereas others feel the vice versa. The major reasons given by the group of boys who felt that they should not get married are that:

- (a) they are not yet economically independent, and
- (b) they are too young for marriage.

Very few of them could visualize that:

- (a) their marriage will result in discontinuity in their education,
- (b) the legal age is not attained yet,
- (c) the health of both mother and child will be adversely affected, and
- (d) this leads to increase in reproductive span of woman.

At the post-test they are able to include these reasons also to their earlier list to the response that he/she should not marry at that age.

The group of boys who feel at the pre-test that they should get married at that age because:

- (a) the parents are eager for their marriage, and
- (b) the early marriage will lead to better understanding of each other.

At the post-test level none of these boys express that they should get married at that age.

As for girls at pre-test almost all the girls feel that they should get married as this will lead to:

- (a) better understanding of each other, and
- (b) desirable adjustment with in-laws.

At the post-test none of the girls said that they

should get married. They have given all other reasons for their responses but still very few could link the age at marriage with the reproductive span of woman.

In the same situation (i.e. II) regarding the source of information related to sex the responses of Ss at the pre-test restricted to only teachers, parents, relatives and books. At post-test the Ss are able to include the educational institutions and agencies/centres as well. Boys have given more sources of sex information both at pre-test and post-test as compared to girls.

Situation III: Majority of the boys and all the girls at pre-test express that the rich can afford to have large family. Few boys at pre-test also express that they (rich) should have small family but on further probing regarding their concept of small family reveals that the small family of rich people includes 4-5 children. Irrespective of the size of family they prefer for rich the Ss at pre-test could not visualize that the rich can maintain and improve their standard of living by having small and planned families with 2-3 children. At pre-test they are able to relate mothers' ill-health to increased number of pregnancies but fail to relate increased infant and maternal mortality and increased nutritional deficiencies in mother and child to this, on the contrary, few girls also feel that the health status of the mother improves due to the nutrition's food that she consumes during pregnancy and lactation after each child birth. At post-test there is a

change in their understanding and they are able to relate increased pregnancies with mother's ill-health and the increase in the nutritional deficiencies in mother and child.

At pre-test, few boys and almost all girls have expressed that the children are gifts of God. At post-test none of the boys have expressed that children are gifts of God and hence they have said that the couple can limit the family size and can have control over the spacing of children. Whereas in case of girls at post-test few still continue to believe that, "children are gifts of God and we should not supersede Him inspite of knowing the ill-effects of large families". Though these girls at the post-test have given correct response to the statement that the union of sperm and ovum results in conception, they have very strong belief/faith in God which they just do not want to change.

Situation IV: The responses of Ss to situation IV reveal that poor people must adopt family planning to live happily. This has been expressed by both, girls and boys. On enquiring about the spacing of children the responses of the girls are close to 2-3 years as compared to boys. Many of the Ss have not expressed spacing in terms of years but have said that when the older child begins to walk and talk the next child should come in the family. The main reason given to this is that the mother can better look after the

children. Few of them could relate this to mother's health. Most of the boys and all girls have felt that a son is a must in a family. Therefore, 'Pooja' and 'Manata' (vows) can also help in solving this problem. According to few girls a son is born only when God is happy and so by 'Pooja' and 'Manata' one can please God.

At the post-test also the Ss continued to believe that the poor people should have a small planned family. They could further express that even if a son is not born in the family the couple should stop producing the children otherwise this will lower their standard of living. In addition to this, their social responsibilities will also increase. Some of the girls have still continued to feel that one son is desirable in the family. They still feel that, no doubt, one can always adopt a male child, but still there is difference in one's own child and an adopted one. At post-test even these few who agree that physical union is a must for a woman to conceive but still they continue to express that without God's desire one cannot have a male child and therefore Pooja and Manata should be continued whether they help or not. At least, according to them, these give satisfaction to couples that they have trust in God and have performed their duty. In relation to spacing one girl has given an interesting response at the post-test. She feels that the family planning methods do more harm to the people than good and so both husband and wife should live separately for 2-3 years. Almost all others are able to

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give expected reasons to the concept of spacing at post-test.

Situation V: Some boys and girls have felt that it is not just the size of family that determines the quality of life of people and happiness at old age. They have expressed that other social responsibilities that one has count more than the mere family size. As regards the happiness at old age they expressed that the children, whether few or more does not matter much. It is the extent of willingness on the part of the children to realize and take up the expected responsibilities of parents that increase or decrease the happiness in old age. They have opined that for agriculture more hands are needed as we still do not have so much of access to mechanical instruments and therefore, farmers should have large families. But, when probed in terms of their preference for family size for our nation, they have preferred small family only. The reasons could not be given by them for their preference for small family.

At post-test the Ss have expressed that a small family is desirable for all for the better quality of life. They have preferred small family for the nation at large also for the same reason. They have further expressed that for additional hands that are needed in agriculture one can always hire the labourers as the cost for this is lesser than the cost invested in the upbringing of additional children. As regards the happiness at old age some boys and girls still feel at the post-test also that much depends on

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the kind of child one has (either a "sapoot" or "kapoot") than merely the number of children one has.

To sum up, the Ss have made a significant gain in knowledge as well as acquired higher level of understanding at the post-test i.e. after the experimental teaching of population education: Between the two sexes, the results reveal that the boys have higher level of correct knowledge and understanding as compared to girls at the post-test. In spite of the fact that Ss, specially the girls, have correct knowledge regarding how conception takes place and the determinants and consequences of large family size, they find it difficult to accept that family size can be controlled by the couple. The major reason for this being ~~their~~ their deep-rooted religious beliefs and traditions regarding the importance that is attached to 'Pooja' and 'Manata' to have a son to ensure security in old age.

SECTION III

EVALUATION OF POPULATION EDUCATION PROGRAMME

This section deals with the results obtained through the evaluation of the population education programme for secondary school students. The programme has been evaluated by the Ss, the two heads of the institutions, the supervisor and the investigator. The evaluation has been attempted both during and after the experimental teaching.

Evaluation by the Ss

The Ss have evaluated the programme at two stages: (a) during the execution of the programme, through the daily lesson evaluation proforma, and (b) after the completion of the programme through the overall programme evaluation guideline.

The responses of the Ss on part A (content-based) and part B (evaluation of teaching) of the daily lesson evaluation proforma have been analysed separately. The percentages have been calculated for the correct responses of the Ss on part A of the daily lesson evaluation proforma for boys, girls and the total sample. Table 27 gives the percentage of correct responses obtained by boys, girls and the total sample on each of the lessons, i.e., I to VIII (the lesson on 'Summary' has not been evaluated for its content).

Table 27 : Percentage of Correct Responses Obtained by Boys, Girls and Total Sample on Each Lesson

Sample	Lesson Numbers								Total
	I	II	III	IV	V	VI	VII	VIII	
Boys	78.6	75.8	65.8	51.3	80.8	78.9	85.3	86.4	75.4
Girls	74.7	72.1	66.6	59.2	76.2	87.2	87.8	78.0	75.2
Total Sample	76.7	73.9	66.2	55.2	78.5	83.1	86.6	82.2	75.3

Table 27 shows that:

1. the total sample has obtained 75.3 per cent correct responses on the total of eight lessons,
2. the percentages of correct responses for boys and girls are 75.4 per cent and 75.2 per cent respectively on the total eight lessons. Therefore, it becomes evident that both boys and girls have attained the same level of knowledge and understanding of the population concepts,
3. both boys and girls have obtained a very low percentage of correct responses for lesson IV (Inter-relationship between population growth and quality of life) i.e. 51.3 per cent and 59.2 per cent respectively as compared to other lessons. However, the girls have obtained higher percentage of correct responses to this lesson (IV) than the boys.

The responses of the Ss on part B of the daily lesson evaluation proforma (evaluation of teaching) have

been analysed separately. This analysis reveals that:

1. all the Ss (100 per cent) have found the subject matter of the lessons to be easy to understand as the content is presented in very simple language with the aid of interesting and appropriate teaching aids.

2. ninety per cent of the Ss have expressed that the speed while teaching the lesson is neither too fast nor too slow. In other words, it is found appropriate for comprehending the lesson content.

3. the language used by the teacher has been simple to understand, as stated by all the Ss. The reasons given are:

- (a) the teacher has used very simple words of day to day use,
- (b) her way of speaking has been very informal as if she is explaining/clarifying something and not teaching,
- (c) the technical terms have been simplified and explained through examples.

4. Hundred per cent of the Ss have stated that the teaching materials/aids used are interesting as well as meaningful to understand the lesson content. Some of the Ss (12 Ss) have also stated that the aids motivated them to attend the classes and learn more since they are not the stereotyped ones used by their teachers in the schools. The

aids like film and film-strip have been specially liked by the Ss.

5. They all felt that the teacher has given full opportunity to discuss. Ninetyfive per cent of the Ss have expressed that they did not have the need to ask any question on the first lesson. The remaining 5 per cent have been feeling shy or hesitant to ask questions on the first day of teaching. Their responses to the evaluation on the last day reveal that 80 per cent of Ss have found the discussions to be good learning experiences. The rest, i.e. 20 per cent have only stated that they enjoyed the discussions and have felt satisfied by the answers given by the teacher (investigator).

6. Nothing specifically emerges from the daily lesson evaluations in terms of the specific concepts which the boys and girls have not understood. However, during discussions both boys and girls have asked questions which are either pertaining to themselves or are of a very general nature. The Table 28 presents the questions asked by boys and girls during discussions.

Table 28 - Questions Asked by Boys and Girls During Discussion

Sr. No.	Boys	Girls
Human Reproduction		
1.	How boys and girls are born?	1. Whether irregular periods are natural for us?
2.	Why twins and multiple births occur?	2. Whether the menstrual blood is a dirty one?
3.	What is a still birth? Does it have any impact on mother?	3. Why a girl conceives before marriage?
4.	Why a woman conceives before marriage?	4. Whether it is alright to use cloth during menstrual period.
5.	What is physical union between a male and a female?	5. How a girl or a boy is born?
6.	How and where does the baby grow inside the mother?	6. Why a women sometimes give birth to many children at a time?
Family Planning		
7.	Why do ladies go for abortion?	7. Whether an unmarried girl should undergo D and C.
8.	Why after tubectomy also a woman conceives?	8. When can menstruation be stopped completely? What is that operation called? How is this different from tubectomy?
		9. What is a safe period method?
		10. Whether one can have menstruation after tubectomy or not?
		11. Do the 'loops' and foils have bad effect on health?
Population Education		
9.	Why shouldn't population education be given even to old people as they influence to a large extent the attitude and practices of younger generation?	

Overall Evaluation of the Population Education Programme by Ss

After the experimental teaching all the Ss have been provided with the overall evaluation guideline to evaluate the programme as a whole. In order to further probe into their written response 30 Ss have been interviewed with the help of the same evaluation guideline. The responses of the Ss reveal that:

1. Hundred per cent of the Ss are convinced about the fact that they should have a small family to improve the quality of life.

As regards the matter of convincing the spouse about the "small family norm", 92 per cent boys and only 5 per cent girls feel that they can do so. The remaining 8 per cent boys are not yet sure whether they will be able to do so. The rest 95 per cent girls feel that if they are the decision-makers they will prefer a small family but in our family system it is mainly the husbands or other elders who take such decisions. Therefore, they are not sure about the future decisions taken in this respect.

2. All Ss have felt that it must become part of their regular school programme for all grades. They have expressed that for the secondary level it is of utmost importance because:

- (a) very few, specially girls, continue their education after secondary stage.

- (b) none of the school subjects provide information related to human reproduction and family planning according to the Ss regarding which we are anxious and there is a need for us to know about all this.
- (c) We may get the opportunity to clarify our doubts regarding the above only in such a course so that we are fully equipped with information to take proper decisions in future.
- (d) This should be taught to both boys and girls so that the decision-making process regarding small family and other aspects of life becomes a joint one.

3. All boys and girls have felt that their parents and teachers must also be given this education so that:

- (a) they can in turn give us correct information in time without any hesitation,
- (b) the Ss will have no hesitation to go to parents/teachers to satisfy their curiosity and clarify doubts.

4. All the Ss have expressed that all the topics that have been taught are important and hence, none can be deleted. However, 75 per cent boys and 82 per cent girls have expressed that the portions on human reproduction and family planning be dealt with in still greater details

because:

- (a) this information is completely new to them,
- (b) they are of great importance to them. All the Ss have expressed that these topics must be part of a course on population education for them.

5. All the girls have expressed that they should be taught by a female teacher so that they have no hesitation, whatsoever, in learning from them as well as asking questions whereas all the boys have expressed that they do not mind being taught by a male or a female teachers as long as the teacher is frank, confident and scientific in approach.

6. None of the boys and girls have completed the classroom and outside activities given to them after each class. They have expressed that they are good learning experiences but the lessons have been so tightly scheduled that they have got no time in between to complete them.

7. The suggestions/comments of Ss toward the end of this evaluation have also been recorded:

- (a) Fifteen per cent of the boys have said that population education should be offered as a compulsory course for them and be treated like other courses. Regarding the examinations 85 per cent have expressed that this should be offered in the form of an elective course to

all but the examination marks need not be added to their overall marks. It must be just a pass course.

- (b) This course be offered to both boys and girls of all ages. Preferences must be given to secondary students.
- (c) The course on population education be offered to parents, teachers and also the older people.
- (d) Twenty per cent boys and 35 per cent girls have expressed that they are fortunate to attend this course for increasing their own understanding from the point of view of the future.

Reactions of the Two Heads of the Institutions Regarding Population Education

The two heads of the institutions have been requested to give their reactions regarding the need of population education for secondary school students, the teaching strategy for such a programme and the inclusion of topics/content on human reproduction and family planning. They have also been requested to state whether the content is to be different for boys and girls. The reactions of the two reveal that:

1. the need of population education for all age groups cannot be denied. However, they both feel that more emphasis be laid on secondary

school level because:

(a) they need to have adequate and authentic information and understanding to improve the quality of their life,

(b) the future population situation of the nation depends on their reproductive behaviour.

2. Both the headmasters opine that in view of the present burden of books and subjects on the students it should be integrated with other school subjects like Biology, General Science, Social Studies, Home Science, etc. But the selection of the content should be based on surveys and prepared by a team of experts from all the related fields.
3. They expressed that efforts must be planned in the direction of training the teachers to teach/relate population education concepts with their subjects. However, they feel that if population education is offered as a separate course, it will require less resources to plan the curriculum, and train the teachers. The students also got the information and understanding in a more compact form which may be more meaningful and effective for them.

4. Both the headmasters have expressed that the topics on human reproduction and family planning must be included for their course on population education because:
 - (a) they themselves are growing physically and psychologically and have a natural curiosity to know about themselves,
 - (b) they may have many misconceptions to clarify,
 - (c) they need to know the advantages and disadvantages of small and large families so as to develop appreciation for small family norm,
 - (d) they need to develop faith in family planning at this stage itself so that they develop understanding that birth is a matter of deliberate choice and not a chance.
 - (e) none of the school subjects at present give information on this content.
5. Both headmasters have expressed that the content for boys and girls should remain same as both should know about each other contribution to the process of reproduction. "Any difference if brought about, would prove unnatural and

artificial", says one headmaster.

6. Regarding the involvement of their institution in promoting population education, they have expressed that they will arrange for film shows, extension lectures by the experts, debates on topics related to population education, and as and when there is an opportunity to include the content into the school curriculum, they will readily do so.

Evaluation by the Supervisor

The evaluative comments/remarks have been recorded by the supervisor after each lesson. These remarks are in terms of the content, teaching methods, use of audio-visual aids and discussions after the class. The major highlights are presented in Table 29.

Reactions of the Investigator

The investigator feels that:

1. Population education programme must be offered to the younger generation of all age groups through formal as well as non-formal education. The parents and teachers must also be offered such a programme to improve the quality of life of the people.

2. Priority must be given to the students of secondary level because:

- (a) they have no information and understanding about the importance of decisions that they take regarding their reproductive behaviour in terms of their future life. The future pattern of the nation's population depends on their decisions.
- (b) they are at the threshold of marriage and family life and before they enter this they have to well equipped with knowledge and understanding to appreciate small family norm and improve their quality of life.
- (c) the marriage age for both boys and girls is very low in India as compared to other countries and more so in Rajasthan it is still lower as compared to other states.

3. Only through such knowledge and understanding people specially parents and teachers will give relevant information to the younger generation in time and will move away from the "hush-hush" attitude that is still prevalent.

4. The formal approach to teach population education is easier. Hence, to start with, the information regarding population education be delivered first through formal teaching and then gradually the out-of-school programme can be developed.

5. In order to save resources in terms of curriculum development, teacher training and evaluation the separate course approach be adopted first and then once the basic concepts are decided upon the integration of the same in the existing school subjects becomes easier.

6. The curriculum on population education be based on surveys regarding the existing knowledge and understanding to make it more need-oriented.

7. The content on population education must include information and understanding regarding demographic changes, determinants and consequences of population growth, human reproduction and family planning.

8. The content on population education that has been tried out on experimental basis for the secondary level can be adopted as it is with the following changes:

- (a) It must run through a longer period of time.
- (b) More emphasis be given to clarify and promote understanding regarding human reproduction and family planning.
- (c) The lesson on inter-relationship between population growth and quality of life be dealt with towards the end of the programme so that it can be better linked with earlier content to make it more concrete for the students to understand.

9. The teacher who teaches this course must be:

(a) well trained in the subject-matter, (b) must herself be convinced with the adoption of small family norm to convince others, (c) must be frank, confident and scientific in teaching the population concepts.

10. The teacher must initiate discussions so that they learn from each other and their misconceptions/doubts can be clarified.

11. More and more teaching aids be used since there are no text-books available and also to make the teaching-learning situation more interesting and meaningful.

12. The teaching aids be properly selected as they should be relevant to the content as well as the target group.

13. The evaluation procedure both before and after the programme be incorporated as part of the programme itself. The feedback on all the aspects of the programme has a great utility value for those concerned with curriculum development on population education.

MAJOR FINDINGS

The major findings that emerge from the results can be subdivided into two broad categories, viz., gain in knowledge and understanding of Ss and evaluation of the programme.

Gain in Knowledge and Understanding of Ss

1. Both boys and girls have made significant gains in knowledge and understanding at .01 level of significance on all the major areas of population education under study after the experimental teaching.
2. The sexwise comparison in terms of percentage of gain in knowledge reveals that the girls have consistently made greater gains in all the four areas under study.
3. Both boys and girls have gained least knowledge in the area of determinants and consequences of population growth. The girls have highest percentage of gain in knowledge in the area of family planning whereas boys have highest percentage of gain in knowledge in the area of human reproduction.
4. In terms of gain in knowledge the girls have gained more correct knowledge than boys whereas the boys have attained more understanding of the population concepts than the girls after the experimental teaching.
5. Inspite of the fact that the Ss, specially the

girls, have correct knowledge regarding how conception takes place and the determinants and consequences of large family size, they find it difficult to accept that family size can be controlled by the couple. The major reason for this being their deep-rooted religious beliefs and traditions regarding the importance that is attached to 'Pooja' and 'Manata' (vows) to have a son to ensure security in old age.

Evaluation of Population Education Programme

1. The overall evaluation of population education programme for secondary school students by the Ss, the supervisor and the investigator reveals that the content, teaching method, audio-visual aids and the evaluation procedure adopted by the investigator is found suitable and acceptable to the secondary school students with a few modifications namely:

- (a) the total content planned on PEP be spread over a longer period of time, and
- (b) the lesson on 'Inter-relationship between population growth and quality of life' be taught towards the end of the programme.

2. The Ss, the investigator and the two headmasters have expressed that human reproduction and family planning must be included in greater details in their curriculum on population education. However, the supervisor feels that some of the aspects, like safe-period method, how conception

takes place, be deleted from the content on human reproduction and family planning.

3. The Ss, the investigator and the two headmasters stated that the content for boys and girls must remain the same whereas the supervisor feels that though the basic content must remain the same the emphasis may vary during the teaching of the contribution of their reproductive behaviour on their quality of life.

4. The Ss, the supervisor and the investigator feel that the teacher who teaches population education must be well acquainted with the subject-matter and be frank, confident and scientific in approach. Boys have expressed no specific preference regarding the sex of the teacher whereas girls have preferred to be taught only by a female teacher.

5. The Ss, the supervisor, the investigator and the two heads of the institutions feel that population education should become an integral part of the regular school curriculum for secondary school students on a priority basis as these students are at the threshold of marriage and family. However, they do believe that this education is important for people of all age groups.

The major findings of the study are discussed in the next chapter.