

**A BASELINE STUDY
ON
CHILDREN'S BEHAVIOUR AND USE PATTERN
OF HYGIENIC LATRINE IN SCHOOL
SANITATION PROGRAMME IN THE
SADAR THANA OF NOAKHALI DISTRICT**

*Final Report
For UNICEF*

**Prepared by
Farid Uddin Ahamed
Assistant Professor
Department of Sociology
University of Chittagong**

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Farid Uddin Ahamed
Assistant Professor
Department of Sociology
University of Chittagong

Executive Summary

Unicef has launched a School Sanitation Project, a new of its kind, in 120 primary schools in Noakhali district in 1996. This programme provides mainly hygienic latrine and safe water behavior among the students in the selected primary schools. The project is also designed to promote improved hygienic practices by parents of school children and community people.

Prior to the installation of a water and sanitation hardware and in some schools a separate sub-programme of Safe Learning Environment, a baseline survey was conducted among 12 schools of the sadar thana in Noakhali district in the month of Oct-Nov. 1996. This report summarizes the findings of the baseline survey. The precise objectives of the baseline survey was to record key hygienic practices of school children (such as washing of hands before eating and after defecation, nail cutting, nature of latrines used, drinking habit etc.), existing health facilities at home and schools, prevailing endemic diseases among school children and level of awareness and motivation of the students.

In addition to this data information were also collected about the 12 schools emphasizing the available facilities (latrine, tubewell etc.) in the school premise, mode of health education provided by the teachers to the students on the basis of health lessons incorporated in different subjects from class I to class V.

Four separate interview schedules were used for this study jointly developed by the principal investigator and Unicef 12 study schools were distinctly identified under three broad categories, namely, (1) Pre - intervention Watsan schools (2) Pre - intervention SLE schools (3) Control schools.

The total sampled students in 12 schools constitute 351 of both sexes. On the other hand also general information were collected form the students of class III, IV and V as a whole group from 12 schools. Through a structural questionnaire 53 teachers were interviewed to provide data on mode of teachings, health lessons to the students, effectiveness and modus operandi of health education and SLE related lessons.

The findings of this report are intended to serve as a basis for comparison with subsequent post intervention surveys. Such comparison will certainly permit to measure the efficacy of various kinds of Watsan and SLE related action programmes on the sample students in question. The major findings obtained in this regard are summed up below:

(1) Presently the study schools lack tubewell facilities only 3 out of 9 have such facility. As such most students are forced to drink unsafe water at school time or visit neighbors tubewell for drinking water. However all students with few exception (99.4%) have the habit of drinking tubewell water at home. Another dimension of positive health behavior observed among the students is the frequent nail cutting practice. At school 89.9% students cut their nails at least fortnightly or weekly.

(2) Virtually none of the study schools possess any sanitary latrine in strict hygienic term within the school premise. Hence the question of water storage provision and provision for washing materials are absent. Students in large number visit neighbors latrine and to a lesser extent open space for defecation/urination in school time.

None the less present survey revealed that only one fifth of the sample students possess sanitary latrine facility at home. It is also encountered that rural households under study have poor provision for water storage and hand washing materials in the latrine. Latrines are very rarely cleaned by the users. Students are not habituated to using sandals while going to latrine. Such factors do often contribute to high risk of water borne diseases like diarrhea, hookworm etc.

(3) The examination of morbidity pattern among the children under study disclosed that the most chronic and predominant types of diseases are diarrhea, stomach ache, worm infestation and dysentery. It is found that girls are high risk of diarrheal attack compared to their male counterpart. However the incidences of eye and skin diseases are encountered in lesser magnitude. The students who suffered from such diseases could not identify the reasons for causation of such diseases. This suggests that the health education provided by teachers at schools or parents at home had no positive effect on their perception/knowledge/awareness level.

(4) As far as the mode of treatment is concerned allopathic treatment is the most popular and commonly used strategy adopted by parents for children having diarrheal attack. ORS therapy is also widely practiced at home (75.2%). In few cases no treatment is initially sought. This study also observed a considerable evidence of sex discrimination and preferential treatment for boys and girls. Male preference in treatment is commonly encountered which suggest that Bangladesh society being a patriarchal one attaches a higher value to male over female children. This is visible in food allocation and health care utilization.

(5) Correctional analysis was performed to find out the relationship or effect of hygiene practices in relation to diarrhea, stomach ache skin, and eye disease. For causation of diarrhea, the most important determining factors are found to be hand washing practice ($<.001$), material used for washing hands after defecation ($<.001$). Nail cutting practice, latrine practice at home and sandal wearing practice are negatively related as found in χ^2 -test. Similar causality is also determined for stomach ache: hand washing practice being very crucial factor again ($<.001$), followed by material used for hand washing practice ($<.01$). Nail cutting, latrine practice at home and sandal wearing practice are found strongly non-significant for stomach ache but highly significant for skin disease ($<.001$) and eye disease ($<.001$).

(6) Causal relationship of diarrhea, stomach ache, skin and eye disease on the one hand with hygiene facilities availability at home was also examined. The types of latrine at home seems to be very significant determinant of diarrhea ($<.001$), skin ($<.001$) while it is unrelated to stomach ache and eye disease. Source of water from latrine is directly related to diarrhea ($<.01$) and stomach ache ($<.02$). Diarrhea and stomach ache are also caused by water transport facility at home ($<.001$). While it bears no relevance to skin or eye disease. Finally latrine cleanliness seems to be non-significant for diarrhea and stomach ache and eye disease while strongly significant for skin disease ($<.001$).

(7) Correlation analysis between hygiene behavior and hygiene facilities availability at home produced encouragingly significant results in χ^2 -test. It implies that the appropriate hygiene facilities when are available at home are likely to encourage those hygienic behavior which are safe from health point of view. The most important findings in this regard are as follows:

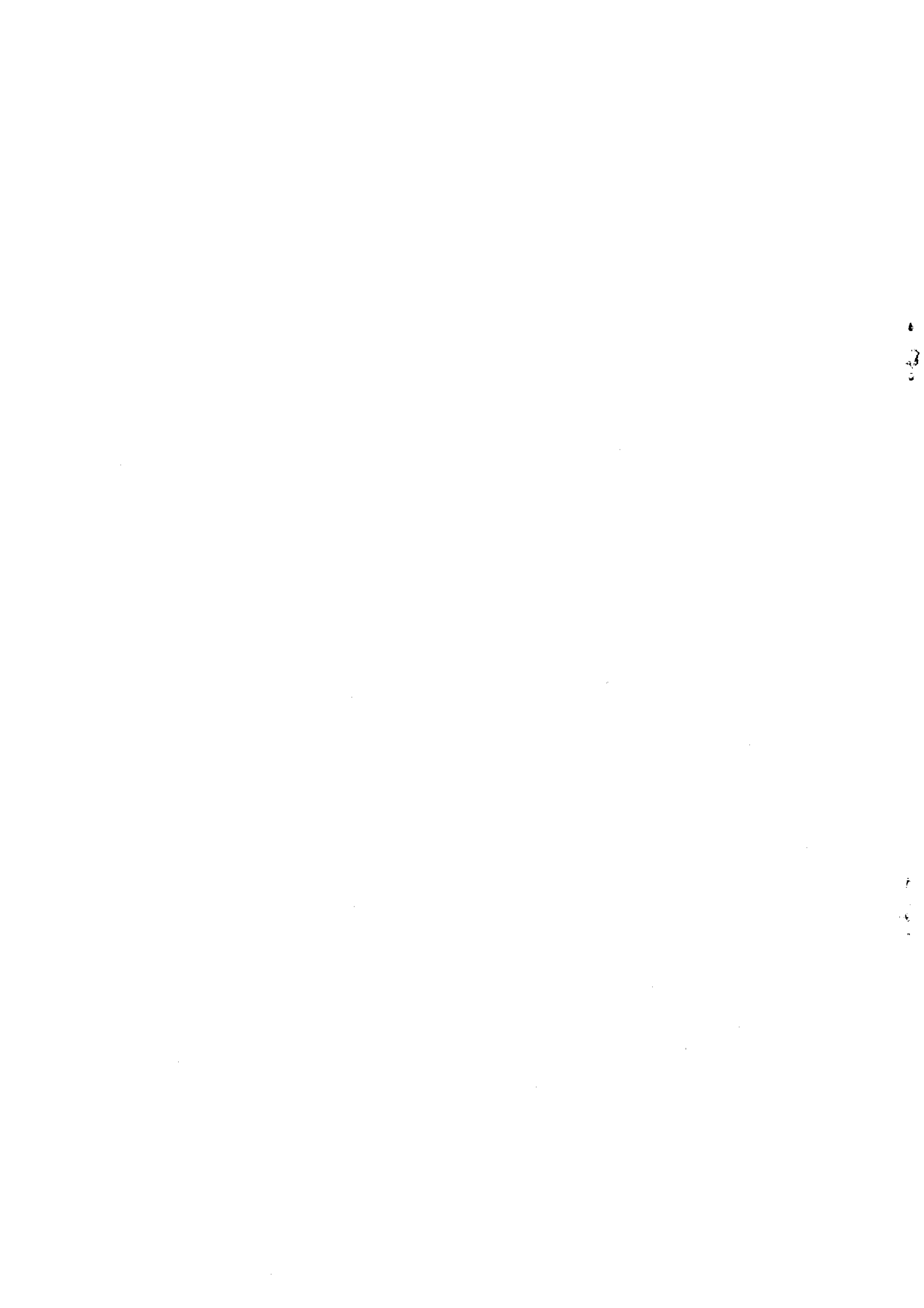
- (a) Moderate correlation exists between hand washing practice and distance of water source ($<.05$).
- (b) Strongest correlation is found between sandal wearing practice and types of latrine at home ($<.001$).
- (c) Equally strongest relationship exists between latrine and water transport ($<.001$).

(8) Last but not the least the present study investigated in to the other facilities at schools, such as maintenance of flower garden, horticultural practices, tree plantation around schools, play ground/open space, pond/waterbody facilities near school premises. The obtained findings show that currently the horticultural and tree plantation programme and flower gardening are virtually non-existent in all the 12 selected schools. Such ideas among the members of the teaching staff or school management committee are yet absent. The few schools which have open space and play ground students use them indiscriminately in leisure period.

(9) Most importantly it should be pointed out very emphatically that teachers of the schools under study have not been so far exposed to long term meaningful training on health, sanitation, environment management issues and also teaching. The teachers are not only less educated but are also less motivated and less trained in adopting useful modes of teaching using charts, role playing games, teaching through story telling and other innovative means. Over-crowding of pupils in the class rooms, inadequacy of sitting benches, desks and chalkboards are also major constraints on way to effective teaching.

Soon after the completion of this baseline survey intensive sanitation and water coverage are going to be provided to 120 primary schools in Noakhali sadar thana along with SLE programme in selected schools. The teachers and students will be brought under comprehensive campaign on the hygienic importance of Watsan and SLE programme.

It is expected that such intervention when carefully executed a major breakthrough in health behavior is likely to follow among the students of the community. A post intervention survey in the study area will bring out the desired effect of such action programme in near future.



CHAPTER ONE

INTRODUCTION

1.1 Background of the Project :

"School Sanitation Programme" started in 1992, is one of the continuous development projects in Bangladesh by the DPHE (Department of Public Health Engineering, Ministry of LGRD and GOB) in close cooperation with PMED/DPE and with support of UNICEF Bangladesh. This programme provides hygienic latrine and safe water supply to selected public primary schools. The project seeks to ensure hygienic practices for clean environment and reduction of excreta-related diseases, provide privacy and convenience for defecation and urination to promote higher school attendance by girls. The programme, intern, is designed to promote improved hygienic practices by parents of school children and community people at large.

The project has, in addition to providing the physical facilities, developed a training manual on School Sanitation Programme, provided training to headteachers, other school teachers and school management committee members. Operational strategy also included involvement of community people as part of DPHE-UNICEF greater national social mobilization activities for water and environmental sanitation programme. Simultaneously, Primary and Mass Education Division of Government of Bangladesh also introduced the Compulsory Primary Education (CPE) in 1992, backed up by an intensive social mobilization plan for increasing enrollment, particularly of girls, higher attendance, retention and completion rates of children in primary schools. At the school level the two programmes reinforced one another. So far the project has made remarkable programmes in attaining its objectives, as seen in two subsequent evaluations in 1994 and 1995. Enrollment of girls went up by 11% in one year 1994-1995. There is a greater awareness about sanitation and hygienic practices among the children of project schools, their parents and others, but it is not yet fully translated into change in hygienic behaviour. While pure drinking water is available to 97% of the people, sanitary latrines are used by only about 47% of the population

1.2 The Focus of the Study Project:

UNICEF has launched a new School Sanitation project in 120 primary schools in Noakhali district (sadar thana) in mid-1996 to make a case study of School Sanitation Programme in Bangladesh. UNICEF felt that the proposed study would provide an opportunity to establish a set of baseline information, and to quantify or assess the process the extent of change in hygienic practices of children, their peers and immediate family members and the community around as a result of introduction of School Sanitation Programme.

Besides the installation of Water and Sanitation (WATSAN) hardware, the study project would also introduce some components of the Safe Learning Environment (SLE) in some selected schools to improve the quality of education and attractiveness of the primary school. It, particularly, covers the health/hygiene and environment education involving active participation of children in lesson-based school projects, developed and implemented by them. It would also make the school a community resource centre through convergence of service like health, water and sanitation, food and nutrition, gender equity, etc. As a whole SLE as comprehensive programme is being designed in order to assess the contribution of this innovative education intervention to behavioural change and development among children.

1.3 Objectives:

In order to measure the effects that might take place due to above mentioned interventions a baseline survey was needed to compare its results with two subsequent post-intervention surveys.

The main objectives of this baseline survey are as follows:

- to gather basic data about the school
- knowledge, attitude and practice of teachers in teaching health/hygiene contents of the text book lessons
- knowledge, attitude, practices and health condition/morbidity of diseases among students

Information were also collected on key-hygienic practices of school children, existing facilities at home and schools, prevailing endemic diseases, level of awareness and motivation of the students.

1.4 Methodology

1.4.1 Selection of Schools:

The baseline survey was administered in 12 Govt. Primary Schools in the Sadar Thana of Noakhali district, as suggested by UNICEF, which were classified in three categories according to the proposed schemes for the future intervention on hygienic practices. The 12 schools which have been brought under survey and presented here in distinct categories are identified as follows:

1) Watsan Category includes four schools namely:

(i) Kripalpur Govt. Primary School (GPS) (ii) Golam Mowla GPS (iii) Ashaydia GPS (iv) Uttar Bagga Iman Ali Register Primary School (RPS) where water and sanitation facilities will be constructed/installed and to be called WATSAN Schools hereafter. In this baseline survey this category is designated as 'Pre-intervention Watsan Category' (Pre-Watsan).

2) The second category of schools is classified as SLE namely:

(i) Baikanthapur GPS (ii) Binodpur GPS (iii) East Rajarampur GPS (iv) Janata Bazar RPS where Self-Learning-Environment (SLE) programme will be initiated in addition to Watsan facilities and to be called SLE Schools hereafter. This category is presented in this survey as 'Pre-intervention SLE Schools' (Pre-SLE).

3) Another group of schools namely:

(i) Rajapur GPS (ii) Killar Char GPS (iii) Char Sullakia GPS (iv) Sonapur GPS will be treated as Control Schools hereafter where no intervention whatsoever will be commissioned. This category of schools is defined here as 'Control Area Schools' (Control). The data on Control area will serve as a basis for comparison with Watsan and SLE categories after introduction of the Watsan and SLE programmes.

The selection of schools under above categories was made by the UNICEF according to prior scheme which clearly shows that the location of schools of all categories follow a pattern showing no influence of geographical dispersion from the sadar thana headquarter.

1.4.2 Data Collection Procedure:

The study used mainly two methods, survey and observation, to collect various types of data relating to knowledge, attitude, hygienic practices of children, their family members, existing facilities available at home and school and teaching practices of teachers. The procedures of data collection and the nature of data collected by each method are discussed below:

Survey

Four separate interview schedules were used for this study. These are:

- (i) baseline data/information on Govt. Primary Schools
- (ii) interview schedule for teachers
- (iii) interview schedule for selective samples of individual students
- (iv) interview schedule for group interview of students.

Each type of interview schedule was pre-tested in side the study area as recommended by the sponsoring agency though it is not a right research procedure. On the basis of pre-testing the ambiguity of questions incorporated in the interview schedules was modified and refined to ensure the validity and quality of data.

Observational Method

In addition to the use of interview schedules we considered it appropriate to apply observational method specially dealing with behaviour pattern of the minor children, mode of teaching in the class room, teaching facilities at the class room, and hygienic facilities at schools. The use of observational method helped us to substantiate the quantitative data with more accurate and realistic information.

1.4.3 Sampling Procedure:

The sampling of schools, teachers and students (as individuals and as groups) was made in accordance with the criteria given by UNICEF, however, with some modifications in the original sampling plan. The sampling procedures are discussed below:

- (i) A data collection protocol was used to gather information from school records as well as on the basis of observation and interviews with the teachers. It was carried out on 12 schools, mostly on headteachers.
- (ii) A separated schedule of questionnaire was administered on 53 teachers who were present on the day of survey (Nov.- Nov. 1996) in 12 schools under study.
- (iii) Data on students were collected by using two different but complementary sets of interview schedules:

a) samples of students from each school was randomly selected as follows:

5 boys and 5 girls from class iii, class iv and class v (a total of 30 students, 15 boys and 15 girls). In fact we selected 351 students from 12 study schools. It should be pointed out here that though the total sample students should have been 360 in all, but in case of two schools required samples were not available on the day of survey, thus forcing us to restrict the total to 351 samples. Tables developed from this questionnaire have been identified in the text as 'individual samples'.

b) A structured questionnaire having similar questions like the one described above, was conducted on all the students present in the classes in iii, iv and v in each study school. A total of 36 samples was obtained from this questionnaire, which has been identified in the text as 'group samples'.

Sample Size and Distribution

Classification of Schools	Individual Samples			Group Samples (in Grades)			No. of Sampled Teachers			
	Male	Female	Total	G-iii	G-iv	G-v	Total	Male	Female	Total
Pre-Watsan (4)	59	53	112	191	178	145	514	14	4	18
Pre-SLE (4)	59	60	119	239	174	153	566	9	10	19
Control (4)	60	60	120	178	153	121	452	13	3	16
Total (12)	178	153	351	608	505	419	1532	36	17	53

1.5 Data Analysis:

Soon after the completion of the survey all the interview schedules were edited in the field and rechecked for ensuring validity of the data. In keeping with the objectives of the research, a code plan was developed for quantification of data for all sets of questionnaire. However, for statistical analysis, a SPSS (Statistical Package for Social Science) computer programme was used only for this schedules of the individual students. Data were tabulated for small samples particularly those of 12 headteachers (for school information) and 53 teachers of the 12 study schools.

On the students part SPSS programme generated both univariate and bivariate contingency tables with X^2 -test results. Cross tabulation were used for measuring relationship between independent, dependent/intervening variables where required. The measurement level of data (being mainly nominal and ordinal in this study) did not permit the application of Pearson-r correlation statistic. As such we relied on Chi-Square statistic for determination of relationship between variables. .05 level of statistical significance was accepted here for validation of relationship in Chi-Square test.

1.6 Research Team:

The survey was conducted by a team of 15 research personnel describe as follows:

- i) Principal Investigator (author himself)
- ii) Two Research Associates
- iii) 12 Field Investigators

under my guidance both this research associates and field investigators were trained and oriented to this research work prior to the commencement of the survey. The research team visited the selected schools and personally contacted the local elites, schools teachers and personnels of the DPHE and DPEO. The field investigators were thoroughly exposed to the different sets of questionnaire so that they can collect and record data as per plan.

Research Associates organized the field survey with appropriate groups of samples. Additionally they were responsible for editing of the field-in interview schedules. Field investigators later on worked as coders and tabulators and manually prepared the tables. On the other hand, one of the research associates having knowledge of SPSS software programme helped me the processing of data in micro computer.

CHAPTER TWO

FINDINGS RELATED TO STUDY SCHOOLS

2.1 General Information on Selected Schools Obtained from Teachers/Official Records

A structured questionnaire was administered among the headteachers/teachers of 12 selected schools in Pre-Watsan, Pre-SLE and Control areas. The teachers provided information from their own experience as well as from the official records on the following issues : 1) Distance between the schools, 2) Number of children aged between 6+ - 10 years in the catchment area of the schools, 3) Maximum time required by students to reach school from the remotest site, 4) Number of students enrollment by grades and sex for the years 1995 and 1996, 5) School attendance by students by sex and grades for the years 1995 and 1996, 6) Number of teachers by sex in schools, 7) Number and size of classrooms in schools, 8) Existing facilities in a classroom, 9) Existing hygiene facilities at schools, and 10) Availability of "Food For Education" programme at schools. Additional information obtained from teachers include the following : facilities for play ground/open space, pond, horticulture/flower garden, tree plantation programme and exposure of students to communication programmes.

2.1.1 Distance Between the Schools:

Of 12 schools, 8 schools are located approximately at a distance of 1.5 km. from one another. On the other hand 4 schools are situated at a distance exceeding 1.5 km upto 2.5 km. However 3 of the Pre-Watsan schools and one Pre-SLE school belong to widely dispersed category having distance between 1.6 km. to 2.5 km.

Table 1: Distance Between Schools

Classification of Schools	Distance Between Schools		Total
	Nearest Range (<1.5 km.)	Farthest Range (1.6 km. to 2.5 km.)	
Pre-Watsan	1	3	4
Pre-SLE	3	1	4
Control	4	--	4
All Areas	8	4	12

2.1.2 Catchment Area and the Number of Children:

7 schools receive their students from the catchment area within 1-4 sq.km. while 5 schools have relatively wider catchment area drawing students from 5-8 sq.km. range.

Table 2: Catchment Area of the Schools

Classification of the Schools	Catchment Area		No. of Schools
	1 - 4 Sq.Km.	5 - 8 Sq.Km.	
Pre-Watsan	2	2	4
Pre-SLE	3	1	4
Control	2	2	4
All Areas	7	5	12

Schools record show that number of children aged 6+ -10 years in the catchment area of the Pre-Watsan, Pre-SLE and Control areas are as follows : 1652 children in Pre-Watsan schools, 2485 in Pre-SLE schools, 1893 in Control schools. The proportions of female children as opposed to male children of the same age group are lower in the catchment areas.

Table 3: Number of School Age Children (6+ - 10) in Catchment Area

Classification of the Schools	Male	Female	Total
Pre-Watsan	895	757	1652
Pre-SLE	1456	1029	2485
Control	998	895	1893

2.1.3 Time Required by Students to Reach School:

As reported by teachers, students of 9 schools require maximum 40 minutes time to reach school from home while students of 3 schools come to school from home requiring one hour walk.

2.1.4 Comparison of Students Enrollment by Grades and Sex:

Table 4 provides a comparison of students enrollment by grads and sex for 1995 and 1996 (collected from office register). A clear trend is visible that total enrollment of students in all grades in 1996 increased in varying degrees from that of 1995. The highest increase in enrollment is strikingly observed in the baby class (248.1%). The percentage increase between 1995 and 1996 in grade I is 15%, in grade IV 20.5% and in grade V 17.8%. Increase in the enrollment rate in grade II and grade III for this period is very negligible. When sex of the children is taken into account data produced a mixed pattern. In baby class percentage increase for female children amounts to 315% as opposed to 206.3% for male children. In case of grades I, II, and III female enrollment rate is much higher compared to their male counterpart, whereas in grades IV and V the reverse trend is present. Percentage increase of female children in class IV stands at 16.7% while the corresponding figure of increase in male children is about 24%. This difference has further widened in class V where percentage increase for male children is 33% in comparison to only 3% in female children.

Table 4: Comparison of Numbers of Students Enrolled by Grades and Sex (1995 and 1996)

Classes	Enrollment in 1995*			Enrollment in 1996			Total Increase/Decrease (1995-96)			%Increase/Decrease (1995-96)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Baby	32	20	52	98	83	181	66	63	129	206.3	315.0	248.1
Grade I	518	448	966	567	548	1115	49	100	149	9.5	22.3	15.4
Grade II	470	450	920	479	478	957	9	28	37	1.9	6.2	4.0
Grade III	517	428	945	470	479	949	-47	51	4	-10.0	11.9	0.4
Grade IV	363	311	674	449	363	812	86	52	138	23.7	13.5	20.5
Grade V	287	298	585	382	307	689	95	9	104	33.0	3.0	17.8

* One school (Zanata Bazar) could not provide figure's for students' enrollment for the year 1995 because of office has no records.

2.1.5 Comparison of School Attendance of Students: 1995-1996

Table 5 shows the difference in attendance rate by boys and girls in different grades for the years 1995 and 1996, as recorded in register book. Baby class recorded an increase of 73.7% of students of both sexes between this two years. A smaller increase in the attendance rate over this period can be noted with regard to grade I (16.2%), grade II (13.7%), grade IV (8.5%) and grade V (12%). Only students of class III decreased by (5.7%) as exception.

Attendance rate varies in degree among boys and girls in all classes. In comparison with the last year (1995), girls in the baby class registered 91.4% increase in attendance compared to the boys in the same class (58.5%). Increased rates of attendance by girls in grade I (21%), grade II (17%), grade III (2.4%) and grade IV (18.8%) consistently hold compared to boys in the corresponding classes. Only male students of class V show the opposite trend (16.3%) as opposed to girls (7.0% increase). It can be also noted that the number of attendance of male students has substantially decreased by 13.3% in grade III. Boys in grade V showed no change whatsoever. From the above table it can be summed up that female attendance rate is showing an encouraging trend over a year.

Table 5: Comparison of School Attendance of the Students (October 1996 and November 1996)

Classes	Attendance on the Same Day in 1995*			Attendance on the Same Day of Visit 1996			Total Increase/Decrease (1995-96)			% Increase/Decrease (1995-96)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Baby	41	35	76	65	67	132	24	32	56	58.5	91.4	73.7
Grade I	368	313	681	412	379	791	44	66	110	12.0	21.1	16.2
Grade II	323	307	630	357	359	716	34	52	86	10.5	16.9	13.7
Grade III	354	331	685	307	339	646	-47	8	-39	-13.3	2.4	-5.7
Grade IV	268	224	492	268	266	534	—	42	42	—	18.8	8.5
Grade V	196	195	391	228	210	438	32	15	47	16.3	7.7	12.0

* One school (Zanata Bazar) could not provide figures for students' enrollment for the year 1995 because of office has no records

Table 6 gives data on the variation on the attendance rate measured on the day of survey (Nov. 1996) against the average attendance of students of the preceding month (Oct. 1996).

Records of the school register show that the attendance rate of students of both sexes in baby class increased by 62.9% in Nov. 1996 compared to Oct. 1996. Similar positive attendance rate is also observed, among students of class II (6.4%) for the same period. On the other hand in other grades, such as grade I, grade III, grade IV and grade V attendance rate of students in the month of Nov. 1996 was much lower than that of Oct. 1996. Turning attention to sex dimension, however, the number of female students increased by 71.8% in baby class, to 8.1% in grade II and to 1.9% in class IV in Nov. 1996 compared to Oct. 1996.

Table 6: Comparison of School Attendance of Students: (Oct. 1996 and Nov. 1996)

Classes	Attendance of Students on Nov. 1996 (the day of survey)			Attendance of Students (average in the month of Oct. 1996)			Total Increase/Decrease from Nov. 1996			% Increase /Decrease from Nov. 1996		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Baby	65	67	132	42	39	81	23	28	51	54.8	71.5	62.9
Grade I	412	379	391	435	415	850	-23	-36	-59	-5.3	-8.7	-15.1
Grade II	357	359	716	341	332	673	16	27	43	4.7	8.1	6.4
Grade III	307	339	646	337	344	681	-30	-5	-35	-8.9	-1.5	-5.2
Grade IV	268	266	534	299	261	560	-31	5	-26	-10.4	1.9	-4.6
Grade V	228	210	438	251	232	483	-23	-22	-45	-9.2	-9.5	-9.3

2.1.6 Number of Teacher's in School:

Table 7 shows distribution of the number of teacher's by sex in Pre-Watsan, Pre-SLE and Control schools. There are, as of now, 58 teachers in total in 12 schools of which 38 are male teacher's and 20 are female teachers (close to 50%). Most of the Pre-Watsan and Control schools are staffed by mainly male teachers having almost ratio of 3:1 between male and female sexes. Only in Pre-SLE schools male and female teachers approximately are equal in number.

Table 7: Number of Teachers in School:

Classification of Schools		Male Teacher	Female Teachers	Both Sexes
Pre-Watsan	W-1	3	--	3
	W-2	3	1	4
	W-4	4	---	4
	W-3	5	3	8
Total		15	4	19
Pre-SLE	S-4	2	1	3
	S-2	2	5	7
	S-1	4	---	4
	S-3	2	6	8
Total		10	12	22
Control	C-3	3	---	3
	C-4	1	4	5
	C-2	3	---	3
	C-1	6	---	6
Total		13	4	17
All Areas		38	20	58

2.1.7 Class Room and Other Facilities in School:

On the basis of interviews with the teachers as well as our observation, it has been found that majority of the schools are made of bamboo structure with tin roof. Some schools have no class room wise partition. The average size and space of the entire school floor approximate about 2100 sq.ft. Some schools however, have separate class rooms varying between 3 to 5 rooms. The space of each room in such schools is close to 500 sq.ft. Each school contains a separate room for teachers' use. Class rooms in each school are inadequately equipped with sitting benches and high tables for the students, as well as chairs and desk for the teachers. As such students are over crowded in class rooms either using floor or sitting in congesation on the benches. Many of the schools lack black board, duster and chalks because of shortage of funds. Teacher's mostly give lessons verbally to students without using chalk or teaching aids.

2.1.8 Food for Education Programme:

In 12 schools under study, the 'Food for Education Programme' is prevailing in 4 schools [(1 in Pre-Watsan, 2 in Pre-SLE schools and 1 in Control schools (Table 8)]. 8 schools in all lack for Food for Education Programme. 3 of Pre-Watsan and 3 of Control school do not have any food for education programme whereas the proportion of food for education programme is evenly found in Pre-SLE schools.

Table 8: Food for Education Programme:

Classification of Schools	FFE Available	FFE Non- Available	Total
Pre-Watsan	1	3	4
Pre-SLE	2	2	4
Control	1	3	4
All Areas	4	8	12

2.1.9 Obstacles to Prevent Students from Learning Effectively at School:

From the review of the data in this section, the following obstacles can be identified which are preventing students from learning effectively at schools at present:

- (i) It seems that given the total number of enrollment per class in each school, the paucity of teachers is a major problem. On average each school has 4 teachers for 6 grades. With this resource it seems impossible that all subjects in each class can be effectively offered.
- (ii) Class rooms are very ill equipped with necessary sitting benches and desks to provide comfortable sitting for enroll students. Besides some schools do not have separate class rooms which is necessary for maintaining educational atmosphere. Teaching materials like black board, chalks are also poorly supplied which affects effective learning.
- (iii) Educational background and training of the teachers are not also up to the usual standard. Teachers should be more trained in lessons relating to health education so that students can receive visual pictorial presentation of health messages covered under the topics. Most importantly teacher-student relationship should be reoriented to one of cordiality instead of coercion.

2.2 Water and Sanitation Facilities at School:

2.2.1 Tubewell Facilities:

In the study areas only 3 schools possess had tubewell (one in Pre-Watsan, one in Pre-SLE and one in Control schools) where 9 schools in total (3 in each category) do not have tubewell in the schools. All the 3 tubewells are found in working condition. As reported by teachers, students of 9 schools (3 in each category) in which there is no tubewell, use neighbour's tubewell for drinking purpose. However, for other purposes like washing face, hands and feet, pond water is used by the students of 9 schools lacking tubewells.

2.2.2 Latrine Facility at Schools:

One out of four in Pre-Watsan, Pre-SLE and Control schools have latrine facility. Nonetheless one school in the Control area which has latrine is reported to be in unusable condition. On the whole 9 school has no latrine facility.

We have noted before that only 3 schools in all categories have latrines. Latrine of only one school (Pre-Watsan area) does have the provision for water storage for washing after defecation. Other 2 latrines lack this provision of storage of water inside the latrine. Our queries from the headteachers brought about that in schools those have latrine, teachers and personnel from school management committee perform the task of maintaining and cleaning those latrines.

Schools having no Latrine Facilities:

It has been observed earlier 9 schools in all areas lack latrine facility. According to the observation of the teachers female students of 10 schools (including one schools having latrine in unusable condition) usually go to neighbours latrine near school for urination and defecation. On the other hand, male students frequently go to bushes or open spaces for natural calls.

As far as the teachers are concerned female teachers in such schools with no latrines also prefer to use neighbours latrines. However, male teachers go to bushes for urination and to neighbours latrine for defecation.

It is also reported that the neighbouring households near the schools having no latrines, do not object for the use of their latrines by the female students and female teachers.

In schools which lack Watsan facilities (10 schools) 7 headteachers claimed to have taken initiatives for installments of Watsan facilities at their schools. 3 headteachers made no efforts to install this facilities.

When asked, 7 headteachers have reported to be greatly concerned for the absence of Watsan facilities in their school. Rest 3 headteachers seem to be less concerned in this regard.

2.3 Other Facilities/Features:

2.3.1 Play Ground/Open Space at Schools:

Out of 12 schools, 10 schools (4 in Pre-Watsan, 3 in Pre-SLE, 3 in Control schools) possess play ground or open space in the school premises, while 2 schools do not have such facility. Students are reported to be using the play ground and open space in the school premises quite indiscriminately in leisure period.

2.3.2 Pond/Water Body Facility Near School Premise:

8 schools out of 12 (3 in Pre-Watsan schools, 4 in Pre-SLE schools, 1 in Control school) have pond/water body situated near the school premises. In schools having pond or water bodies, students in general, are reported to be using these facilities for washing purpose only.

2.3.3 Horticulture/Flower Gardens at School:

Our own observation as well as views of teachers confirmed that no schools under study does have any horticulture and flower garden around school premise.

2.3.4 Tree Plantation Programme:

According to the statement of the teachers, tree plantation programmes are presently available in 11 schools out of 12 schools but our assessment failed to find out presence of any intensive tree plantation programmes in those schools.

It may so happen that few saplings are planted casually on unplanned basis in some schools which cannot be strictly designated as being proper tree plantation programme. In schools having such fluid tree plantation programmes, saplings are collected by teachers and SMC members from students' home stock or nurseries. However, such stands are very few and far between according to our observation.

2.3.5 Exposure of the Schools to the Communication Programmes:

We also probed from the teachers and headteachers whether the schools have been exposed to the communication programmes (poster, leaflets, discussions, Radio-TV talk etc.) on (i) School Sanitation Programme (ii) Water and Sanitation Programme (iii) EPI/DDT/ORT Programmes.

It is reported that five schools only (2 in Pre-Watsan, 1 in Pre-SLE, and 2 in Control schools) organised communication of such programmes either *partially* or *fully* to the students. 7 schools could not offer any coverage of such programmes to their students. The ORT and EPI Programmes have been predominant features of communication exposures, mainly through discussions and the use of leaflets.

CHAPTER THREE

FINDINGS RELATED TO TEACHERS

A separate questionnaire was administered on all teachers who were present in the schools on the day of survey. Information from the teachers that have been collected relate to sex, age, marital status, total length of service, service in the present school, educational qualification, subject taught by teachers, training of the teachers in C-in-Ed, sanitation and other programmes, knowledge of teachers on health lessons in each subject, and mode of teaching in health lessons.

3.1 Personal Background of the Teachers

Sex:

The distribution of the teachers who have been interviewed is given Table 9 below. The sample teachers included 36 male teachers and 17 female teachers in all schools.

Table 9: Sex of School Teachers

Classification of Schools	Sex of School Teachers		Total
	Male	Female	
Pre-Watsan	14	4	18
Pre-SLE	9	10	19
Control	13	3	16
All Areas	36	17	53

Age:

Table 10 shows the distribution of teachers by age. About 36.0% of the teachers belong to 20-39 age group. Close to 55.0% of the teachers are aged between 40-49 years while only 9% exceeds 50 years of age.

Table 10: Age of the Teachers

Age Group	% Distribution of Teachers
20-39	19 (35.8)
40-49	29 (54.7)
50-60	5 (9.4)
All Age Group	53 (100.0)

Marital Status:

49 of the 53 teachers are married while rest (4) are unmarried or widowed.

Length of Service of the Teachers:

15 teachers served under DPE for less than 20 years while 33 teachers for about 26 years. 5 teachers who are employed in registered schools did not served at all under DPE. Table 11 shows the length of service at their present schools. Among the sample teachers 33 (62.3%) teachers are teaching at their present schools for 1-6 years, 13 (24.5%) for 7-12 years and 7 (13.2%) teachers for 13-23 years.

Table 11: Length of Service at the Present Schools

Length of Service at the Present Schools	% Distribution
1-6 Years	33 (62.3)
7-12 Years	13 (24.5)
13-23 Years	7 (13.2)

Educational Background:

Among the 53 teachers, 22 teachers (41.5%) have completed S.S.S. Certificate. 17 teachers (32.1%) have educational background upto H.S.C. level (one with Alim Certificate). 13 teachers (24.5%) have graduation degree (8 teachers with Fazil degree). Only one teacher had master degree in Bengali.

Table 12: Educational Background of the Teachers

Educational Background		No. of Teachers	Total % Distribution
S.S.C.	With Dakhil	-----	22 (41.5)
	Without Dakhil	22	
H.S.C.	With Dakhil	1	17 (32.1)
	Without Dakhil	16	
Bachelor	With Dakhil	8	13 (24.5)
	Without Dakhil	5	
Masters		1	1 (1.9)

Block Teaching and Subjects Taught by Teachers:

Out of 53 teachers, 49 teacher's are engaged in block teaching in grade i and grade ii while 4 teacher's who are serving as headteachers are not. In addition to block teaching, majority of the teachers are atleast teaching 3 more subjects in grade iii, grade iv and grade v. However, the assignments of subjects for each teacher vary at different schools. The major subjects for all classes compulsorily include Bengali, English, Mathematics, Environmental Studies (Science), Environmental Studies (Social) and Religion. Physical Education is offered only at grade iv and v.

3.2 Training of Teachers

C-in-Ed Training:

In all sample teachers, 48 teachers completed C-in-Ed training while 5 teachers have no training in this regard.

Additional Training:

Our survey on teachers additional training disclosed that weeklong training of several types namely sanitation training, population training, curriculum training and multilateral learning training has been undertaken by most of the teachers sometimes, in combinations, at different times of service.

Sub-Cluster Training:

The teachers affirmatively informed that the sub-cluster training which they have taken focused on methods of teaching as well as conducting classes with emphasis on health and hygiene contents of different subjects.

Practical demonstration of using nail clippers, charts, pictures, posters constituted key part of sub-cluster training. This training was mainly administered by ATEO. The training was structured mainly on lecture method, as reported by sample teachers. Occasionally participatory activities and practical assignments were incorporated with the training process.

School Sanitation Training:

8 out of 53 teachers have reported to have received school sanitation programme in particular. Teachers who have taken school sanitation programme training were asked to classify types of latrine. All of them could distinguish between sanitary and non-sanitary latrines in technical terms. In their conception water seal and ring-slap latrines are pit latrines under the category of sanitary latrine while others are not. The objectives of such training was to enhance motivational level of the teachers for taking necessary measures towards installment of sanitary latrines at school. Among those who have received training, seven teachers out of eight have reported to have attempted to install latrines at school. However, their initiatives in this regard could not produce any positive outcome for the reasons such as financial constraints and lack of backup responses from the authorities of the school management committee.

3.3. Health and Hygiene Contents in the Primary Education Curriculum:

All of the teachers are aware about the lessons on health and hygiene in the school curriculum. As reported by teachers, the table 13 shows the subjects contained topics or lessons on health and hygiene. The teachers were asked to mention number of topics or lessons on health/hygiene offered by them. It has been found that 20 teachers perhead give lessons on 8 topics, 16 teachers perhead on 12 lessons, and 17 teachers perhead on 16 lessons in all classes all together.

Different modes are adopted by the teachers in covering the health contents and messages included in the subjects. The most common mode entails narration of the issues/themes in simpler terms which makes sense to the minor children. The use of charts and other modes such as story telling, role play, are rarely used by the teachers.

Table 13: Health and Hygiene Contents in the Existing Primary School Curriculum

Subjects	Grades	Topics
Bangla	III	1. Sobir Path 2. Manush Badcha
English	III	1. Harun's Home
	IV	1. Brush Your Teeth
	V	1. Kepping Well
Environmental Studies (Social)	III	1. Amadar Bash Greah
	IV	1. Bangladesher Jonoshonkha O Samajic Paribash"
	V	1. Bangladesher Jonoshonkha O Shamasha
Environmental Studies (Science)	III	1. Khadha 2. Phani 3. Shastha O Paribash 4. Jonoshankha O Paribash 5. Kushanchkhar Dur Karta Biggan 6. Mila Misha Kaz Kari 7. Jonoshnkha
	IV	1. Phani 2. Baiu 3. Shasthabidi 4. Prathamc Chikithsha 5. Rog Bistara Kit Phatongha 6. Kushanskar O Rogbaydi 7. Janbhahan 8. Paribash O Jonoshankha
	V	1. Shasthabidi 2. Prathmic Chikithsha 3. Jonashankha O Paribash
Religion	III	1. Hatar Parichannata 2. Chokhar Parichannata
	IV	1. Parichannata
	V	1. Parichannata 2. Balo Kaza Sahajogita Kara O Manda Kaza Bada Daya

CHAPTER FOUR

FINDINGS RELATED TO STUDENTS

This section will provide information on students' current attitude-knowledge and practices of health and hygiene as well as pattern of morbidity from water borne diseases. Keeping in mind that this baseline survey will provide the basis for future comparison in the behaviour pattern of students when the appropriate intervention will be introduced, data have been presented here according to the distinctive categories already identified as Pre-Watsan, Pre-SLE and Control schools.

As envisaged in the objectives, for collection of data on various issues we used two separate sets of questionnaire among the students: One questionnaire on selected samples of individual students of class III through V and the second one on group that is whole of III through V. For convenience of interpretation and analysis the findings obtained from the two sets of questionnaire have been presented here simultaneously each issue in question.

4.1: CURRENT AVAILABILITY OF HYGIENE FACILITIES AT HOME

Here we have examined various hygiene facilities which are available at the home of the students with special focus on types of water source, types of latrine, time taken to use facilities, water transport and storage practice and home cleanliness. The findings in this regard are presented in this section.

Types of Water Source:

Drinking water status, as we know, is one of the most important indicators with regard to general hygiene status. Safe drinking water is especially important for prevention of diarrhoea, cholera and many other water borne diseases. This study shows that almost cent percent (99.4%) of respondents from all study schools (Pre-Watsan, Pre-SLE and Control) are used to tubewell water for drinking [Table 14(A)].

Table 14(A): Types of Water Source for Drinking at Home of the Respondents

(% Distribution)

Classification of Study-Schools	Safe Water Drinking (Tubewell)	Unsafe Water Drinking (Pond, Open Well)	Total
Pre-Watsan (N=112)	112 (100.0)	—	112 (100.0)
Pre-SLE (N=119)	118 (99.2)	1 (0.8)	119 (100.0)
Control (N=120)	119 (99.2)	1 (0.8)	120 (100.0)
All Areas (N=351)	349 (99.4)	2 (0.6)	351 (100.0)

Similar findings is observed on a broader scale among the students studied in groups (class wise) as shown in [Table 14(B)]. However, it is curious to point out that when examined class wise students of class V in all areas displayed a slightly lower habit of drinking pond water (0.2%) compared to the students of class IV (2.4%) and III (4.4%). In general the trend suggests that the students under survey have access to safe water facilities at their home.

Table 14(B): Types of Water Source for Drinking at Home of the Students in Group (Class III, IV & V)

(% Distribution)

Class	Classification of Study-Schools	Tubewell Water	Pond Water	Total
III	Pre-Watsan N=191	191 (100.0)	---	191 (100.0)
	Pre-SLE N=239	215 (90.0)	24 (10.0)	239 (100.0)
	Control N=178	175 (98.3)	03 (1.7)	178 (100.0)
	Total N=608	581 (95.6)	27 (4.4)	608 (100.0)
IV	Pre-Watsan N=178	178 (100.0)	---	178 (100.0)
	Pre-SLE N=174	170 (97.7)	04 (2.3)	174 (100.0)
	Control N=153	145 (94.8)	08 (5.2)	153 (100.0)
	Total N=505	493 (97.6)	12 (2.4)	505 (100.0)
V	Pre-Watsan N=145	145 (100.0)	---	145 (100.0)
	Pre-SLE N=153	153 (100.0)	---	153 (100.0)
	Control N=121	120 (99.2)	01 (0.8)	121 (100.0)
	Total N=419	418 (99.8)	01 (0.2)	419 (100.0)
All Classes N=1532		1492 (97.4)	40 (2.6)	1532 (100.0)

Types of Latrine:

The kind of latrine used at home bears significant health implication to a great extent. As such data were obtained on the structure of the latrine used by the respondents at home to see whether hygienic sanitary latrines are in use by the students under survey. It was found that students classified their home latrines several types namely: pucca, water-seal, septic tank latrine, open latrine, hanging latrine. Our probe into the mater discovered that only water-seal, and homemade pit latrine could be strictly defined as sanitary latrine while others belong to non-sanitary latrine no matter whether this are structurally pucca or hanging. From this view point only one-fifth of the students (20.2%) possess sanitary latrines at home (Water-Seal and Homemade Pit) and the rest are purely non-sanitary and unhygienic in nature. A large number of households (around 80.0%) only have the provision for semi-sanitary or purely non-sanitary latrine facilities. 44.0% of the respondents are habituated to use of hanging structure or bushes or open space [Table-15(A)].

Table 15(A): Types of Latrine at Home of the Respondents

(% Distribution)

Types of Latrine at Home	Pre-Watsan N=112	Pre-SLE N=119	Control N=120	All Areas N=351
Water- seal/Septic (Sanitary)	11 (9.8)	26 (21.8)	34 (28.3)	71 (20.2)
Semi-Sanitary (Pucca, Open Dug)	53 (47.3)	37 (31.1)	33 (27.5)	123 (35.0)
Non-Sanitary (Hanging, Bushes, Open Space)	48 (48.9)	56 (47.1)	53 (44.2)	157 (44.7)

The group interview schedule provides a picture which allows us to document that the students of class IV and V have higher proportion (34.9% and 32.2%) than students of class III (17.8%) who have sanitary latrine at homes [Table 15(B)]. Therefore, findings indicate that still a great majority of the students lack access to sanitary latrine facilities at home with their community.

Table 15(B): Types of Latrine at Home of the Respondents (in Group)

(% Distribution)

Class	Classification of Schools	Pucca (non-sanitary)	Water Sealed	Hanging	Open Space
III	Pre-Watsan N=191	37 (19.4)	09 (4.7)	29 (15.2)	116 (60.7)
	Pre-SLE N=239	48 (20.1)	67 (28.0)	63 (26.4)	61 (25.5)
	Control N=178	42 (23.6)	32 (18.0)	74 (41.6)	30 (16.9)
	Total N=608	127 (20.9)	108 (17.8)	166 (27.3)	207 (34.1)
IV	Pre-Watsan N=178	39 (21.9)	50 (28.1)	26 (14.6)	63 (35.4)
	Pre-SLE N=174	33 (19.0)	84 (48.3)	30 (17.2)	27 (15.5)
	Control N=153	09 (5.9)	42 (27.5)	74 (48.4)	28 (18.3)
	Total N=505	81 (16.0)	176 (34.9)	130 (25.7)	118 (23.4)
V	Pre-Watsan N=145	38 (26.2)	50 (34.5)	28 (19.3)	29 (20.0)
	Pre-SLE N=153	01 (0.7)	59 (38.6)	63 (41.2)	30 (19.6)
	Control N=121	17 (14.1)	26 (21.5)	73 (60.3)	05 (4.1)
	Total N=419	56 (13.4)	135 (32.2)	164 (39.1)	64 (15.3)
All Classes N = 1532		264 (17.2)	419 (27.4)	460 (30.0)	389 (25.4)

Types of Water Source for Latrine Use:

As regards to water source for latrine use Table 16(A) and Table 16(B) shows that though tubewell is used strictly for drinking, pond water is widely used for all practical purposes including latrine use other than drinking. 87.5% students of the Watsan schools, 75.6% students of the SLE schools and 84.2% Students of the Control schools mainly depend on pond water for latrine use.

Table 16(A): Types of Water Source for Latrine Use.

Classification of Schools	(% Distribution)	
	Pond	Tubewell
Pre-Watsan N=112	98 (87.5)	14 (12.5)
Pre-SLE N=119	90 (75.6)	29 (24.4)
Control N=120	101 (84.2)	19 (15.8)
All Areas N=351	289 (82.3)	62 (17.7)

Group wise analysis also approximately close to that figure 78.4% with regard to the use of pond water for latrine use. It may suggest the paucity of adequate tubewell facility in each household.

Table 16(B): Types of Water Source for Latrine Use (in Group) (% Distribution)

Class	Classification of Study-Schools	Pond	Tubewell
III	Pre-Watsan N=191	115 (60.2)	76 (39.8)
	Pre-SLE N=239	162 (67.8)	77 (32.2)
	Control N=178	150 (84.3)	28 (15.7)
	Total N=608	427 (70.2)	181 (29.8)
IV	Pre-Watsan N=178	142 (79.8)	36 (20.2)
	Pre-SLE N=174	162 (93.1)	12 (6.9)
	Control N=153	124 (81.0)	29 (19.0)
	Total N=505	428 (84.8)	77 (15.2)
V	Pre-Watsan N=145	121 (83.4)	24 (16.6)
	Pre-SLE N=153	120 (78.4)	33 (21.6)
	Control N=121	105 (86.8)	16 (13.2)
	Total N=419	346 (82.6)	73 (17.4)
All Classes N = 1532		1201 (78.4)	331 (21.6)

Distance of Source of Water from Latrine:

It is presumed that the distance of the source of water from latrine may be relevant to hygienic hand washing and cleaning after defecation. In other words, it is likely that distant water source from latrine may affect health behaviour adversely if it is located in far off the latrine. The present survey reveals that 47.6% households in Pre-Watsan, Pre-SLE and Control area require less than 5 minutes' walk between source of water and latrine. On the other hand, 52.4% of the households bring water from distant place requiring more than 5 minutes' walk for latrine use [Table-17(A)].

Table 17(A): Distance of Source of Water from Latrine.

(% Distribution)

Time Taken to Reach the Source of Water	Pre-Watsan N=112	Pre-SLE N=119	Control N=120	ALL AREAS N=351
Near (Less than 5 Minutes)	55 (49.1)	53 (44.5)	59 (49.2)	167 (47.6)
Far (More than 5 Minutes)	57 (50.9)	66 (55.5)	61 (50.8)	184 (52.4)

The pattern observed above consistently holds when all students' in group were examined [Table 17(B)].

Table 17(B): Distance of Source of Water from Latrine

(% Distribution)

Classes	Time Taken to Reach the Water Source from Latrine	
	Near (Less Than 5 Minutes' Walk)	Far (More Than 5 Minutes' Walk)
Class III N=608	289 (47.5)	319 (52.5)
Class IV N=505	272 (53.9)	233 (46.1)
Class V N=419	202 (48.2)	217 (51.8)
All Classes N=1532	763 (49.8)	769 (50.2)

Water Transport:

Next we examined whether water is stored near latrine or not and the findings are presented in table 18(A) and 18(B). It may be noted that one-fifth of the households of the respondents have provision for water storage near the latrine. It means that a greater number of households member (around 80.0%) are compel to fetch water from out-lying sources of water in the absence of storing facilities.

Table 18(A): Water Transport

	(% Distribution)	
Storage of Water Near Latrine	Provision for Water Storage Near Latrine	No Provision of Water Storage Near Latrine
Pre-Watsan N=112	24 (21.4)	88 (78.6)
Pre-SLE N=119	26 (21.8)	93 (78.2)
Control N=120	23 (19.2)	97 (88.8)
All Areas N=351	73 (20.8)	278 (79.2)

The data from the students in group substantiate the above pattern with strikingly higher proportion in the non-storage category of households 87.1% on average, as shown in table 18(B). It is evident from above analysis that the situation possess a serious health risk as per as hygienic cleanliness is concerned.

Table 18(B): Water Transport

(% Distribution)

Classes	Classification of Schools	Provision for Water Storage Near Latrine	No Provision for Water Storage Near Latrine
III	Pre-Watsan N=191	8 (4.2)	183 (95.8)
	Pre-SLE N=239	26 (10.9)	213 (89.1)
	Control N=178	46 (25.8)	132 (74.2)
	Total N=608	73 (12.0)	535 (88.0)
IV	Pre-Watsan N=178	34 (19.1)	144 (80.9)
	Pre-SLE N=174	27 (15.5)	147 (84.5)
	Control N=153	17 (11.1)	136 (88.9)
	Total N=505	78 (15.4)	427 (84.6)
V	Pre-Watsan N=145	4 (2.8)	141 (97.2)
	Pre-SLE N=153	22 (14.4)	131 (85.6)
	Control N=121	20 (16.5)	101 (83.5)
	Total N=419	46 (11.0)	373 (89.0)
All Classes N = 1532		197 (12.9)	1335 (87.1)

Storage Practices:

We have noted before that an insignificant number of households of the sample students do have provision for water storage near latrine. Therefore we turned to find out the instruments which are used for water storage. Tables 19(A) and 19(B) provide data on the nature of container used for water storage. 61.6% of the households use mostly bucket for water storage in general in the study areas which is slightly higher in Control schools (74.0%) and further higher in the Pre-Watsan schools (75.0%) and only 38.5% in Pre-SLE schools. Second in importance in storage practice comes pitcher 30.1% in the total sample (N=73). Only small fraction of the respondents (8.2%) reported to have used barrel (large container).

Table 19(A): Storage Practices

(% Distribution)

Container for Water Storage	Pre-Watsan N=24	Pre-SLE N=26	Control N=23	ALL AREAS N=73
Pitcher	5 (20.8)	14 (53.9)	3 (13.0)	22 (30.1)
Bucket	18 (75.0)	10 (38.5)	17 (74.0)	45 (61.6)
Barrel	1 (4.2)	2 (7.7)	3 (13.0)	6 (8.2)
Total	24 (100.0)	26 (100.0)	23 (100.0)	73 (100.0)

Similar picture is obtained from students studied in groups [Table 19(B)]. The use of bucket for water storage tends to dominate (47.2%) among the households having storing provision. Pitcher accounts for 35.0% on average in all grades. It is followed by barrel (17.8%).

Table 19(B): Storage Practices

(% Distribution)

Class	Classification of Schools	Pitcher	Bucket	Barrel (Large Container)
III	Pre-Watsan N=01	01 (100.0)	---	---
	Pre-SLE N=26	13 (50.0)	01 (3.8)	12 (46.1)
	Control N=46	12 (26.1)	30 (65.2)	04 (8.7)
	Total N=73	26 (35.6)	31 (42.5)	16 (21.9)
IV	Pre-Watsan N=34	03 (8.8)	31 (91.2)	---
	Pre-SLE N=27	10 (37.0)	17 (63.0)	---
	Control N=17	06 (35.3)	05 (29.4)	06 (35.3)
	Total N=78	19 (24.4)	53 (67.9)	6 (7.7)
V	Pre-Watsan N=04	04 (100.0)	---	---
	Pre-SLE N=22	09 (40.9)	05 (22.7)	08 (36.4)
	Control N=20	11 (55.0)	04 (20.0)	05 (25.0)
	Total N=46	24 (52.2)	9 (19.6)	13 (28.2)
All Classes N = 197		69 (35.0)	93 (47.2)	35 (17.8)

From the foregoing analysis it is clearly reflected that bucket which is medium sized container, the common mode used for water storage. Contrarily the use of large container like barrel is much restricted among the households of surveyed students. This might affect the proper hygienic cleanliness of both latrine and users.

Latrine Cleanliness at Home:

Personal body hygiene not only depends largely on nature of latrine whether sanitary or non-sanitary but also to proper and frequent cleanliness of the latrine in use. From this context students were asked whether their home latrine are cleaned or not and if cleaned the frequency of cleaning was examined. Table 20 indicates that 47.9% of the respondents have reported their home latrine are normally cleaned, varying in frequencies. It is notable that the proportion of the clean latrine in the Pre-Watsan area falls drastically to only 39.3%. Judged from this discrepancy students of Pre-Watsan schools seem to be exposed to high risk of health hazards.

Table 20: Latrine Cleanliness at Home

Classification of the Schools	(% Distribution)	
	Clean Latrine	Donot Clean Latrine
Pre-Watsan N=112	44 (39.3)	68 (60.7)
Pre-SLE N=119	64 (53.8)	55 (46.2)
Control N=120	60 (50.0)	60 (50.0)
All Areas N=351	168 (47.9)	183 (52.1)

Information obtained from students' in group seem to be highly confusing. Because students public response to the issue of home cleanliness was found to be biased (cent-percent positive attitude).

Frequency of Cleaning Latrine:

Turning to the frequency of cleaning latrine it can be noted from Table 21(A) that 62.5% of the latrines of the total households of respondents are cleaned regularly on a weekly basis. There is no significant difference between Pre-Watsan, Pre-SLE and Control areas. Close to one-fourth of the latrines (23.8%) among the total samples are cleaned on monthly basis. On the other hand a meagre portion (13.7%) of latrines are fortnightly cleaned.

Table 21(A): Frequency of Cleaning Latrine

(% Distribution)

Classification of Schools	Once a Week	Fortnightly	Monthly
Pre-Watsan N=44	26 (59.1)	5 (11.4)	13 (29.5)
Pre-SLE N=64	41 (64.1)	9 (14.1)	14 (21.9)
Control N=60	38 (63.3)	9 (15.0)	13 (21.7)
All Areas N=168	105 (62.5)	23 (13.7)	40 (23.8)

Findings obtained from group students [Table 21(B)] corroborate the pattern of latrine cleaning among the individual students. 61.5% of the students in all grades view that their latrines are cleaned once a week. However, a reverse trend is seen on the frequency of cleaning latrine on fortnightly and monthly basis between this two sets of sample. Here percentage of cleaning latrine on monthly basis is almost half (13.9%) compared to those households cleaning latrine on fortnightly basis (24.6%).

Table 21(B): Frequency of Cleaning Latrine.

Class	Classification of Schools	(% Distribution)		
		Once a Week	Fortnightly	Monthly
III	Pre-Watsan N=41	29 (70.7)	04 (9.8)	08 (19.5)
	Pre-SLE N=113	101 (89.4)	06 (5.3)	06 (5.3)
	Control N=73	64 (87.7)	---	09 (12.3)
	Total N=227	194 (85.5)	10 (4.4)	23 (10.1)
IV	Pre-Watsan N=78	28 (35.9)	20 (25.6)	30 (38.5)
	Pre-SLE N=114	60 (52.6)	48 (42.1)	6 (5.3)
	Control N=51	17 (33.3)	24 (47.1)	10 (19.6)
	Total N=243	105 (43.2)	92 (37.9)	46 (18.9)
V	Pre-Watsan N=88	45 (51.1)	38 (43.2)	5 (5.7)
	Pre-SLE N=60	39 (65.0)	14 (23.3)	7 (11.7)
	Control N=39	21 (53.8)	08 (20.6)	10 (25.6)
	Total N=187	105 (56.1)	60 (32.1)	22 (11.8)
All Classes N=657		404 (61.5)	162 (24.6)	91 (13.9)

Means used for Cleaning Latrine:

Students selected as individual samples as well as selected in groups were asked to specify instruments/materials through which latrines are cleaned at home. Results are presented in Table 22(A) and 22(B) respectively. It should be pointed out here that the question in this regard yielded multiple responses in some cases for which the percent distribution as exceeded cent percent.

Water is found to be the widely used (88.7%) popular means for cleaning latrine in all study areas (Pre-Watsan, Pre-SLE and Control). More than fifty percent of the households, however, use brush and broom with water for cleaning latrine. Use of ash accounts for 20.8% of the latrines of the surveyed households and almost equal number of households use detergents for latrine cleaning. A variation can be observed in Pre-SLE and Control areas with regard to the ash and detergents.

Table 22(A): Means Used for Cleaning Latrine

Means Used for Cleaning the Latrine	(% Distribution)			
	Pre-Watsan N=44	Pre-SLE N=64	Control N=60	All Areas N=168
Water	42 (95.5)	53 (82.8)	54 (90.0)	149 (88.7)
Brush/Broom water	24 (54.5)	38 (59.4)	31 (51.7)	93 (55.4)
Ash	16 (36.4)	3 (4.7)	16 (26.7)	35 (20.8)
Detergent	4 (9.1)	19 (29.7)	15 (25.0)	38 (22.6)

A more evenly distributed figures are found from the bigger sample groups with regard to instruments/materials used in cleaning latrine. Use of water only claims nearly half of the households while it decreased to about more than one-third households using brush and broom with water. Use of detergent is very insignificant among the bigger sample groups 15% [Table 22(B)].

Table 22(B): Means Used for Cleaning Latrine

(% Distribution)

Class	Classification of Schools	Brush/Broom Water	Ash/Detergent	Water Only
III	Pre-Watsan N=41	20 (48.8)	14 (34.1)	7 (17.1)
	Pre-SLE N=113	34 (30.1)	2 (1.8)	77 (68.1)
	Control N=73	51 (69.9)	16 (21.9)	6 (8.2)
	Total N=227	105 (46.3)	32 (14.1)	90 (39.6)
IV	Pre-Watsan N=78	30 (38.5)	9 (11.5)	39 (50.0)
	Pre-SLE N=114	14 (12.3)	12 (10.5)	88 (77.2)
	Control N=51	18 (35.3)	8 (15.7)	25 (49.0)
	Total N=243	62 (25.5)	29 (11.9)	152 (62.6)
V	Pre-Watsan N=88	51 (58.0)	7 (8.0)	30 (34.0)
	Pre-SLE N=60	25 (41.7)	11 (18.3)	24 (40.0)
	Control N=39	3 (7.7)	20 (51.3)	16 (48.7)
	Total N=187	79 (42.2)	38 (20.3)	70 (37.4)
All Classes N=657		246 (37.4)	99 (15.1)	312 (47.5)

It is evident from the above analysis, other than few cases, Latrines are not cleaned or disinfected by hygienic materials of any kind which may cause disorders of stomach and worm-infestation directly.

4.2: MORBIDITY PATTERN AMONG THE STUDENTS

Most common forms of diseases among children under 10 years age in rural Bangladesh include diarrhoeal diseases, cholera, intestinal disorder, seivour malnutrition related anaemia, night blindness, respiratory disorder, typhoid, conjunctivitis and scabies. Many studies in context of rural Bangladesh documented that diarrhoeal diseases, stomach ache and worm infestation constitute major burden of morbidity and mortality of children in rural communities. Many of these disorders are commonly related to unhygienic practices of unsafe water drinking, exposure to environmentally hazardous conditions like using non-sanitary latrine, proper non-washing of hands after defecation and before eating, bearfootedness while going to latrines and other contaminated places around the community. Keeping this perspective in mind, an attempt was made in this study to find out the pattern of morbidity among the students of class III, IV and V attending the selected schools.

Two separate questionnaires administered on randomly selected individual samples and on groups included specific questions relating to any kind of diseases that children suffered within one month preceding from the day of survey. Accordingly information were collected and recorded after through probing as to the nature of disorder among the children. The findings in this regard are illustrated bellow.

Incidence of Stomach Ache:

Table 23 reveals that more than one half of the respondents (55.0%) complain to have suffered from stomach ache. The prevalence rate of stomach ache is relatively higher both in male and female children in Pre-SLE category (63.9%) compared to Pre-Watsan and Control category (around 50.0%). In all areas the incidence of stomach ache was found higher in male than among female children (59.0% male and 50.9% female). So, the findings of the table suggests that one out of two children had stomach ache problems in study area.

Table 23: Prevalence of Stomach Ache and Diarrhoea

(% Distribution)

Classification of Schools	Suffered from Stomach Ache		
	Boys	Girls	Both Sexes
Pre-Watsan MN=59 FN=53 TN=112	31 (52.5)	25 (47.2)	56 (50.0)
Pre-SLE MN=59 FN=60 TN=119	39 (66.1)	37 (61.7)	76 (63.9)
Control MN=60 FN=60 TN=120	35 (58.3)	26 (43.3)	61 (50.8)
All Areas MN=178 FN=173 TN=351	105 (59.0)	88 (50.9)	193 (55.0)

Kinds of Stomach Ache:

Several kinds of stomach ache have been identified by respondents which are classified here under major four categories of disorder relating to stomach problem. These are (1) Dysentery (2) Parasitic intestinal problems (worm infestation) and (3) Malabsorption/constipation.

Students who are reported to have stomach ache during the last one month, parasitic intestinal disorder (worm infestation) seem to be predominant disorder among the samples approaching (63.2%). The frequency distribution of the samples with parasitic intestinal problems increased to 75% in Pre-SLE category. This area has the highest concentration of intestinal problem along with hookworm infestation compared to Pre-Watsan and Control. The findings of this nature seem very probable in view of the unhygienic practices relating to wearing of sandals while going to open latrine, movement without using sandals and using unclean non-sanitary latrine.

Consequently hookworms infestation among other types of parasitic diseases, tends to be common ailments among children in the rural setting. Next in magnitude of the stomach problem stands malabsorption disorder. Almost one-third of the respondents having stomach problem are reported to have pain associated with constipation, malabsorption and westing. These conditions may be attributed mainly to overwhelming prevalence of malnutrition among infant and children. Low nutritional store often contributes to serious problem of indigestion and stomach pain. This is suspected that a significant portion of samples in our study suffer from malnutritional disorder which has not been investigated in the present study. However, a few cases (5.7%) suffered from dysentery (Table-24).

Table 24: Kinds of Stomach Ache

(% Distribution)

Kinds of Stomach Ache	Classification of Schools			
	Pre-Watsan N=56	Pre-SLE N=76	Control N=61	All Areas N=193
Dysentery	4 (7.1)	4 (5.2)	3 (4.9)	11 (5.7)
Parasitic, Intestinal Problem (Worm Infestation)	27 (48.2)	54 (75.0)	38 (62.3)	122 (63.2)
Malabsorption/Pain/ Constipation/Westing Indigestion	25 (44.7)	15 (19.7)	20 (32.8)	60 (31.1)
Total	100.0	100.0	100.0	100.0

The students having stomach problem were asked to identify the causes which might have contributed to the stomach disorder. About 65% children could not give any answer for their stomach problem. The rest of the 35% associated stomach ache with (a) food poisoning/contaminated food (33.7%) (b) worm infestation almost (10%) and (c) irregular dieting (1%). All the study areas (i.e., Pre-watsan, Pre-SLE, Control) exhibit uniform picture with regard to the causality of stomach ache.

Table 25: Perceived Causes of Stomach Ache by the Respondents

(% Distribution)

Perceived Causes	Pre-Watsan N=56	Pre-SLE N=76	Control N=61	All Areas N=193
Food Poisoning /Contaminated Food	22 (39.3)	23 (39.3)	20 (32.8)	65 (33.7)
Irregular Dieting	1 (1.8)	1 (1.3)	---	2 (1.0)
Worm Infestation	4 (3.2)	13 (17.1)	1 (1.6)	18 (9.3)
Don't know	34 (60.7)	44 (58.0)	45 (73.8)	124 (64.3)

Incidence of diarrhoea:

Diarrhoea seems to be a major health problem in this area. On an average 43% of the respondents in total sample complain to have suffered from diarrhoea, which is extremely a high rate of incidence. When judged from the classification of schools, students belonging to the Control category exhibits a much higher incidence of diarrhoea (47%) compared to Pre-Watsan and Pre-SLE (around 41%). The occurrence of diarrhoea by sex, showed no mark variation except in Control category: Here 55% of male students reported to have diarrhoeal diseases compared to female students 40% [Table 26(A)].

Table 26(A): Incidence of Diarrhoea

(% Distribution)

Classification of Schools	Suffered from Diarr		
	Boys	Girls	Both Sexes
Pre-Watsan MN=59 FN=53 TN=112	23 (39.0)	24 (45.3)	47 (41.9)
Pre-SLE MN=59 FN=60 TN=119	26 (44.1)	23 (38.3)	49 (41.2)
Control MN=60 FN=60 TN=120	33 (55.0)	24 (40.0)	57 (47.5)
All Areas TN=351 MN=178 FN=173	82 (46.1)	71 (41.0)	153 (43.6)

Group interview, however, shows that 14% of the students of all classes from III to V were attacked with diarrhoea—a pattern different that observed in selected samples. Nearly one-fourth of the class III students had diarrhoea (24.2%) which sharply decreased to 9.7% among class IV and further declined to only 5% of class V students. It shows that in age grade of minors are at high risk of diarrhoea compared to growing children [Table 13(B)]. Many studies bear evidence of the similar trends that infants are more vulnerable than children of higher age.

Table 26(B): Prevalence of Diarrhoea Among Children in Groups

(% Distribution)

Class	Classification of Schools	Suffered from Diarrhoea
III	Pre-Watsan N=191	20 (10.5)
	Pre-SLE N=239	73 (30.5)
	Control N=178	54 (30.3)
	Total N=608	147 (24.2)
IV	Pre-Watsan N=178	22 (12.4)
	Pre-SLE N=174	17 (9.8)
	Control N=153	10 (6.5)
	Total N=505	49 (9.7)
V	Pre-Watsan N=145	07 (4.8)
	Pre-SLE N=153	11 (7.2)
	Control N=121	03 (2.5)
	Total N=419	21 (5.0)
All Classes N=1532		217 (14.1)

Mode of Treatment for Diarrhoea:

Table 27(A) highlights the mode of treatment preferred for those having diarrhoeal diseases. It can be seen from this table that with the onset diarrhoea initial response comes in the form of ORS therapy only : 83.7% in Pre-SLE, 72% in Control area, and 70.0% in Pre-Watsan area. If diarrhoeal condition turns quite acute, children having diarrhoea were taken to allopathic doctor for required medicine (20.9%). Interestingly about 16% diarrhoeal children were given no treatment at all. This is consistent in all three study areas. We can also note the evidence of sex discrimination in treatment facilities among male and female children. The proportion of female children having diarrhoea compared to the male counterpart is higher in the category who receive no treatment at all (13.4% for male, 18.3% for female). The sex discrimination is also very much covered the express in the administration of ORS therapy (70% female vs 80% male), as well as allopathic medicine (18.3% female vs 23.2% for male). This pattern of discrimination in health care has been observed by many other researchers in the rural community of Bangladesh.

Table 27(A): Treatment Sought by Respondents for Diarrhoea

(% Distribution)

Nature of Treatment	Pre-Watsan			Pre-SLE			Control			All Areas		
	Boys N=23	Girls N=24	Total N=47	Boys N=26	Girls N=23	Total N=49	Boys N=33	Girls N=24	Total N=57	Boys N=82	Girls N=71	*Total N=153
ORS Therapy Only	16 (69.6)	17 (70.8)	33 (70.2)	24 (92.3)	17 (73.9)	41 (83.7)	25 (75.8)	16 (66.7)	41 (71.9)	65 (79.3)	50 (70.4)	115 (75.2)
Allopathic Medicine	8 (34.8)	4 (16.7)	12 (25.5)	4 (15.4)	4 (17.4)	8 (16.3)	7 (21.2)	5 (20.8)	12 (21.1)	19 (23.2)	13 (18.3)	32 (20.9)
No Treatment	2 (8.7)	6 (25.0)	8 (17.0)	5 (19.2)	3 (13.0)	8 (16.3)	4 (12.1)	4 (16.7)	8 (14.0)	11 (13.4)	13 (18.3)	24 (15.7)

* Patients received more than one treatment

When we turn to data in Table 27(B) on students in group, ORS therapy seems to be the dominant mode of diarrhoeal treatment in all classes (80.6%), followed by occasional treatment by doctor (18%). The number of children who had diarrhoea but not treated all appears to be strikingly very low (1.4%). The application of ORS therapy among the patients of class III and V is evenly higher (around 81.0% in class III) compared to those in class V (76.2%). On the other hand, additional treatment through doctor beyond ORS therapy appears to be consistently higher among class III and V (18.4%) compared to students of class V having diarrhoea (14.3%).

Table 27(B): Treatment Sought by Respondents in Groups for Diarrhoea

(% Distribution)

Class	Nature of Treatment			
	Classification of Schools	ORS Therapy	Allopathic Medicine	No Treatment
III	Pre-Watsan N=20	17 (85.0)	03 (15.0)	---
	Pre-SLE N=73	62 (84.9)	10 (13.7)	01 (1.4)
	Control N=54	40 (74.1)	14 (25.9)	---
	Total N=147	119 (81.0)	27 (18.4)	1 (0.6)
IV	Pre-Watsan N=22	18 (81.8)	04 (18.2)	---
	Pre-SLE N=17	14 (82.4)	03 (17.6)	---
	Control N=10	08 (80.0)	02 (20.0)	---
	Total N=49	40 (81.6)	9 (18.4)	---
V	Pre-Watsan N=7	05 (71.4)	02 (28.6)	---
	Pre-SLE N=11	09 (81.8)	---	02 (18.2)
	Control N=3	02 (66.7)	01 (33.3)	---
	Total N=21	16 (76.2)	3 (14.3)	2 (9.5)
All Classes N=217		175 (80.6)	39 (18.0)	3 (1.4)

Skin Diseases:

In rural environment of Bangladesh skin diseases of various types occur frequently, though not deadly in nature. Scabies, rashes, boils are variant types of skin diseases that are prevalent mostly among poor segments engaged in agriculture fishing and other vocations. They arise from chiefly unhygienic living condition that prevail in the rural society which are often neglected and remain without treatment. Nonetheless such skin diseases when become acute may cause serious disability and physical discomfort and may be passed on through personal contact. In the present study skin diseases like scabies and rashes were found among 17% of the total samples [(Table 28(A)]. Among the three study areas the prevalence of skin disease is markedly low (10%) in the Control schools and highest in the Pre-watsan schools (around 26.0%).

Table 28(A): Skin Diseases (Scabies and Rashes)

Classification of Schools	(% Distribution)	
	Suffered from Skin Diseases (Scabies and Rashes)	
Pre-Watsan N=112	29	(25.9)
Pre-SLE N=119	18	(15.1)
Control N=120	13	(10.8)
ALL Areas N=351	60	(17.1)

When examined in the group context one in every four students of all classes have reported to suffered from skin disease [Table 28(B)]. Here the prevalence of skin disease is found to be markedly higher among the students of class V (42.2%) and lowest among the students of class III (around 16%).

Table 28(B): Skin Diseases in Groups

(% Distribution)

Class	Classification of Schools	Suffered from Skin Diseases (Scabies & Rashes)
III	Pre-Watsan N=191	39 (20.4)
	Pre-SLE N=239	44 (18.4)
	Control N=178	13 (7.3)
	Total N=608	96 (15.8)
IV	Pre-Watsan N=178	24 (13.5)
	Pre-SLE N=174	60 (34.5)
	Control N=153	41 (26.8)
	Total N=505	125 (24.8)
V	Pre-Watsan N=145	49 (33.8)
	Pre-SLE N=153	73 (47.7)
	Control N=121	55 (45.5)
	Total N=419	177 (42.2)
All Classes N=1532		398 (26.0%)

It may be observed from the Table 29(A), scabies constitute the major type of skin disease in all areas (88.3%). The other type rashes is confirmed to only 11.7% of the students in all grade. Viewed from the context of areal division Pre-SLE presents the acuteness of the scabies (94.4%) followed by students of Control group (92.3%).

Table 29(A): Types of Skin Diseases (Scabies and Rashes)

(% Distribution)

Classification of Schools	Types of Skin Diseases	
	Scabies	Rashes
Pre-Watsan N=29	24 (82.8)	15 (17.2)
Pre-SLE N=18	17 (94.4)	1 (5.6)
Control N=13	12 (92.3)	1 (7.7)
All Areas N=60	53 (88.3)	7 (11.7)

The pattern of skin diseases among the students in group provides a slightly different scenario. Here around three-fourth of the all students suffered from scabies (72.6%) while the rest one-fourth suffer from the rashes (27.4%), as shown in Table 29(B). However, the occurrence of skin diseases are unevenly distributed among the students of class IV. The proportion of rashes is markedly higher (33.6%) compared to students of class III and class V (around 23%).

Table 29(B) : Types of Skin Diseases (Scabies and Rashes)

(% Distribution)

Classes	Classification of Schools	Types of Skin Diseases	
		Scabies	Rashes
III	Pre-Watsan N = 39	23 (59.0)	16 (41.0)
	Pre-SLE N = 44	41 (93.2)	3 (6.8)
	Control N = 13	10 (76.9)	3 (23.1)
	Total N = 96	74 (77.1)	22 (22.9)
IV	Pre-Watsan N = 24	18 (75.0)	6 (25.0)
	Pre-SLE N = 60	27 (45.0)	33 (55.0)
	Control N = 41	38 (92.7)	3 (7.3)
	Total N = 125	83 (66.4)	42 (33.6)
V	Pre-Watsan N = 49	29 (59.2)	20 (40.8)
	Pre-SLE N = 73	60 (82.2)	13 (17.8)
	Control N = 55	43 (78.2)	12 (21.8)
	Total N = 177	132 (74.6)	45 (25.4)
All Classes N = 398		289 (72.6)	109 (27.4)

Eye Diseases:

Eye diseases appear in various form such as conjunctivitis (casually related to virus), night blindness (because of Vitamin-A deficiency) and infections related disorder (arising from exposure to dust, bodily uncleanliness etc.). Like other diseases eye disorder occurs equally in alarming proportion among rural population. The present survey discover that eye disease occurs in one child in every five children (21.4%). Table 30(A) also indicates clearly that it is more wide spread in the samples of Pre-watsan schools (close to 30%) and lowest in Pre-SLE samples (14.3%).

Table 30(A): Eye Diseases

Classification of Schools	(% Distribution)	
	Suffered from Eye Infection	
Pre-Watsan N=112	33 (29.5)	
Pre-SLE N=119	17 (14.3)	
Control N=120	25 (20.8)	
All Areas N=351	75 (21.4)	

The prevalence rate of eye disease among the students in all grades presented in Table 30(B), approximately around 39.0%. No significant difference is observed between class III, IV and V with regards to the findings. The results of these tables obviously bear evidence of the pervasive existence of eye diseases in both types of the samples (individual and groups).

Table 30(B) : Eye Diseases in Groups

(% Distribution)

Class	Classification of Schools	Suffered from Eye Diseases
III	Pre-Watsan N = 191	93 (48.7)
	Pre-SLE N = 239	78 (32.6)
	Control N = 178	77 (43.3)
	Total N = 608	248 (40.8)
IV	Pre-Watsan N = 178	46 (25.8)
	Pre-SLE N = 174	89 (51.1)
	Control N = 153	49 (32.0)
	Total N = 505	184 (36.4)
V	Pre-Watsan N = 145	48 (33.1)
	Pre-SLE N = 153	67 (43.8)
	Control N = 121	44 (36.4)
	Total N = 419	159 (37.9)
All Classes N = 1532		591 (38.6)

Table 31(A) and 31(B) examined the specific types of eye disease among the affected children both in individual and group samples. We encountered with two major types namely (1) Eye infection and (2) Swollen Eye. The ratio of eye infection to swollen eye is roughly 3:1 when all areas are taken into account. On the count of specific areas, students of the Control areas having eye disease mostly from the type of eye infection (84%). Only in Pre-SLE areas the swollen eye problem roughly equals with eye infection in distribution (47% -52%).

Table 31(A): Types of Eye Diseases

(% Distribution)

Classification of Schools	Types of Eye Diseases	
	Swollen Eye	Eye Infection
Pre-Watsan N=33	10 (30.3)	23 (69.7)
Pre-SLE N=17	8 (47.1)	9 (52.9)
Control N=25	4 (16.0)	21 (84.0)
All Areas N=75	22 (29.3)	53 (70.7)

Table 31(B) suggests almost an identical pattern as to the wide spread prevalence of eye infection (80.4%) over swollen eye problem (20%) among students of all grades. An exception to this trend is, nonetheless, observed in class four. Here the proportion of the eye infection problem increased to 84% with a concomitant decreased in the swollen eye disorder (15.8%). Hence it is apparent that eye infection also shares a significant burden of morbidity among the students under study.

Table 31(B) : Types of Eye Diseases in Groups

(% Distribution)

Class	Classification of Schools	Types of Eye Diseases	
		Swollen Eye	Eye Infection
III	Pre-Watsan N = 93	5 (5.4)	88 (94.6)
	Pre-SLE N = 78	33 (42.3)	45 (57.7)
	Control N = 77	15 (19.5)	62 (80.5)
	Total N = 248	53 (21.4)	195 (78.6)
IV	Pre-Watsan N = 46	2 (4.3)	44 (95.7)
	Pre-SLE N = 89	27 (30.3)	62 (69.7)
	Control N = 49	---	49 (100.0)
	Total N = 184	29 (15.8)	155 (84.2)
V	Pre-Watsan N = 48	23 (47.9)	25 (52.1)
	Pre-SLE N = 67	9 (13.4)	58 (86.6)
	Control N = 44	2 (4.5)	42 (95.5)
	Total N = 159	34 (21.4)	125 (78.6)
All Classes N = 591		116 (19.6)	475 (80.4)

4.3: HYGIENIC BEHAVIOUR, PRACTICE AND KNOWLEDGE OF THE STUDENTS

4.3.1 Drinking Behaviour:

Safe water drinking has been recommended to be important health behaviour for avoidance of many water borne diseases like diarrhoea, cholera etc. by policy planner and health professionals.

Accordingly health education programme has emphasised on the importance of drinking tubewell water among the rural people as a protection against water borne diseases since a decade ago. In the earlier times rural people being ignorant of danger of drinking contaminated water often depended on pond water as a source of drinking. As a consequence diarrhoea and cholera brokeout on epidemic proportions almost everywhere in the country side. But in the recent past strong motivational programme was launched by GOs and NGOs for eradication of cholera and diarrhoea through installment of tubewells in rural areas. As a result of such endeavors people of the rural area now use tubewell water atleast for drinking quite habitually. The present study bears testimony to this behavioral change as shown in Table 32(A) and 32(B).

Table 32(A): Drinking Behaviour of Students at School

(% Distribution)

Classification of Schools	Safe Water (Tubewell)	Unsafe Water (pond, river, open well)	Total
Pre-Watsan N=112	111 (99.1)	1 (0.9)	112 (100.0)
Pre-SLE N= 119	119 (100.0)	---	119 (100.0)
Control N=120	119 (99.2)	1 (0.8)	120 (100.0)
All Areas N=351	349 (99.4)	2 (0.6)	351 (100.0)

Table 32(B): Drinking Behaviour of Students at School (in Group)

(% Distribution)			
Class	Classification of Schools	Safe Water (Tubewell)	Unsafe Water (Pond/River)
iii	Pre-Watsan N=191	191 (100.0)	---
	Pre-SLE N=239	234 (97.9)	05 (2.1)
	Control N=178	178 (100.0)	---
	Total N=608	603 (99.2)	05 (0.8)
iv	Pre-Watsan N=178	178 (100.0)	---
	Pre-SLE N=174	174 (100.0)	---
	Control N=153	153 (100.0)	---
	Total N=505	505 (100.0)	---
v	Pre-Watsan N=145	145 (100.0)	---
	Pre-SLE N=153	153 (100.0)	---
	Control N=121	121 (100.0)	---
	Total N=419	419 (100.0)	---
All Classes N=1532		1527 (99.7)	5 (0.3)

Students in Pre-Watsan, Pre-SLE and Control school almost in cent percent drink tubewell water at schools, in conformity with their same drinking behaviour at home. This is equally true for all students no matter whether they studying at the lower or higher classes at the school.

Perceived Reasons for Preference of Tubewell Water:

The perception level of the respondents for drinking tubewell water was assessed and the results obtained are shown in Table 33. Most of the students in all study areas (87.2%) could relate tubewell water to safe drinking practice being clean, germless and tasty as well. Even they could clearly identify pond water as contaminated and hazardous for health with risk for diarrhoeal attack (13.7%). Only small fraction (4.0%), however, could not specify water as a source of transmission for any kind of diseases. This can be seen as a major breakthrough in their health behaviour pertaining to drinking practice.

Table 33: Perceived Reasons for Preference of Tubewell Water by Students

(% Distribution)

Perceived Reasons	Classification of Schools			
	Pre-Watsan N=112	Pre-SLE N=119	Control N=120	*All Areas N=351
Pond Water is Perceived as Germful	21 (18.8)	18 (15.1)	9 (7.5)	48 (13.7)
Tubewell Water is Perceived as Germless, Clean and Tasty	101 (90.2)	97 (81.5)	108 (90.0)	306 (87.2)
Could not Specify	3 (2.7)	6 (5.0)	5 (4.2)	14 (4.0)

* Percent distribution exceeded 100 percent because of multiple responses.

4.3.2: Latrine Use Practice

Places for Defecation and Urination at School:

Our enquiry was also directed to trace out the prevailing behaviour of the students with regard to urination and defecation during school time. It was observed that there is a variation in the behaviour pattern relating to urination/defecation, specially among male and female children. Since the provision for latrine within the school premise, by and large, is non-existent, students are compelled to use various places for natural calls outside the school premise namely in neighbours home adjacent to schools, bushes, open spaces and sometimes their home latrine after going back from school [Table 34(A) and 34(B)].

The use of school own latrine is restricted to 6.0% among both male and female students (Perhaps in those schools which have latrine). In schools having no latrine girl students largely prefer neighbour's house near school premise (7 in every 10 female students). Only 46.1% of the male students use neighbour's latrine while same proportion of male students are habituated to use either open space (25.9%) or bushes (20.2%). Only minor female children occasionally use bushes (2.3%) and open space (4.6%) for natural calls.

Table 34(A): Places for Defecation and Urination at School (% Distribution)

Places of Defecation and Urination	Classification of Schools								
	Pre-Watsan N=112		Pre-SLE N=119		Control N=120		All Areas N=351		All Areas Total
	Boys N=59	Girls N=53	Boys N=54	Girls N=60	Boys N=60	Girls N=60	Boys N=178	Girls N=173	Both Sexes N=351
Neighbor's Latrine	24 (40.7)	38 (71.7)	40 (67.8)	40 (66.7)	18 (30)	44 (73.3)	82 (46.1)	122 (70.5)	204 (58.7)
Bushes	11 (18.6)	2 (3.8)	9 (15.3)	1 (1.7)	16 (26.7)	1 (1.7)	36 (20.2)	4 (2.3)	40 (11.4)
Open Space	20 (33.9)	2 (3.8)	6 (10.2)	---	20 (33.3)	6 (10.0)	46 (25.9)	8 (4.6)	54 (15.4)
Schools' Own Latrine	2 (3.4)	3 (5.7)	3 (5.1)	8 (13.3)	4 (6.7)	1 (1.7)	9 (5.1)	12 (6.9)	21 (6.0)
Own Latrine at Home	2 (3.4)	8 (15.1)	1 (1.7)	11 (18.3)	2 (3.3)	8 (13.3)	5 (2.8)	27 (15.6)	32 (9.1)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Classwise analysis of the data which was conducted in larger group also produced a similar pattern. More than half of the students in all classes use neighbour's latrine (57.4%) near school. One fifth of the students in groups (23.1%) largely depend on bushes or open space for urination/defecation. Curiously the proportion of students of class III compared with those of class V using bushes and open space is relatively higher (30.3% vs 28.9%) but students of class IV is seen much less user of bushes and open space for their defecation (9.5%). On the other hand percentage of those students in all classes who are using schools' own latrine approaches 13.2% and almost half of this figure 6.4% use their own home latrine during school time [Table 34(B)].

Table 34(B): Places for Urination and Defecation at School

(% Distribution)

Classes	Classification of Schools	Place of Urination and Defecation				
		Neighbors House	Bushes	Open Space	Schools Own Latrine	Own House
iii	Pre-Watsan N=191	91 (47.6)	10 (5.2)	45 (23.6)	29 (15.2)	16 (8.4)
	Pre-SLE N=239	132 (55.2)	08 (3.3)	37 (15.5)	62 (25.9)	---
	Control N=178	94 (52.8)	20 (11.2)	64 (36.0)	---	---
	Total N=608	317 (52.1)	38 (6.3)	146 (24.0)	91 (15.0)	16 (2.6)
iv	Pre-Watsan N=178	96 (54.0)	09 (5.1)	06 (3.4)	32 (18.0)	35 (19.7)
	Pre-SLE N=174	111 (63.8)	---	13 (7.5)	50 (28.7)	---
	Control N=153	102 (66.7)	01 (0.7)	19 (12.4)	---	31 (20.3)
	Total N=505	309 (61.2)	10 (2.0)	38 (7.5)	82 (16.2)	66 (13.1)
v	Pre-Watsan N=145	82 (56.6)	48 (33.1)	05 (3.4)	---	10 (6.9)
	Pre-SLE N=153	78 (51.0)	---	40 (26.1)	29 (19.0)	06 (3.9)
	Control N=121	93 (76.9)	---	28 (23.1)	---	---
	Total N=419	253 (60.4)	48 (11.5)	73 (17.4)	29 (6.9)	16 (3.8)
All Classes N=1532		879 (57.4)	96 (6.3)	257 (16.8)	202 (13.2)	98 (6.4)

Special attention was focused particularly on those students who use (1) neighbour's house latrine near schools and (2) bushes with additional emphasis on number of times of urination/defecation in those places. Usually number of students using neighbour's latrine for once in a day is strikingly higher among female students (73.8%) compared to their male counterparts (62.2%), as shown in [Table 35(A)]. Those who use neighbour's latrine two times a day is about 26% both among male and female students. The ratio of female students to male students using bush for natural calls is 1:9. Only 4 female students as opposed to 36 male students use bush for natural calls in total samples (who uses bushes for their urination/defecation).

Table 35(A): Frequency of Urination and Defecation at Neighbor's House and Bushes in a Day

Frequency of Defecation & Urination at Neighbor's House and Bushes	Places of Urination and Defecation															
	Neighbor's House Latrine Near School N=204								Bushes N=40							
	Pre-Watsan		Pre-SLE		Control		All Areas		Pre-Watsan		Pre-SLE		Control		All Areas	
	Boys N=24	Girls N=38	Boys N=40	Girls N=40	Boys N=18	Girls N=44	Boys N=82	Girls N=12 2	Boys N=11	Girls N=2	Boys N=9	Girls N=1	Boys N=16	Girls N=1	Boys N=36	Girls N=4
Once	13 (54.2)	26 (68.4)	29 (72.5)	32 (80.0)	9 (50.0)	32 (72.7)	51 (62.2)	90 (73.8)	8 (72.7)	1 (50.0)	6 (66.7)	1 (100)	3 (18.8)	1 (100)	17 (47.2)	13 (75.0)
Twice	6 (25)	12 (31.6)	9 (22.5)	8 (20.0)	8 (44.4)	10 (22.7)	23 (28.0)	30 (24.6)	1 (9.1)	—	1 (11.1)	—	10 (62.5)	—	12 (33.3)	—
Thrice	5 (20.8)	—	2 (5.0)	—	1 (5.6)	2 (4.6)	8 (9.8)	2 (1.6)	2 (18.2)	1 (50.0)	2 (22.2)	—	3 (18.8)	—	07 (19.4)	01 (25.0)

Turning to group behaviour as a whole 9 in every 10 both among male and female students normally use neighbour's latrine once a day. Taking all students of class III, IV and V into account the pattern consistently holds identical. Only 3 female students of class III go to bushes for urination and defecation as opposed to 15 male students in the same class. None of the female students of class IV and V ever use bushes. This means that irrespective of frequency of urination and defecation varying in little degree, male students of class III, IV and V choose bushes for urination and defecation [Table 35(B)].

Table 35(B): Frequency of Urination and Defecation at Neighbor's House and Bushes.

(% Distribution)

Frequency of Defecation and Urination at Neighbor's House and Bushes.	Places of Defecation/Urination															
	Neighbor's House						Bushes									
	Class iii		Class iv		Class v		All Classes		Class iii		Class iv		Class v		All Classes	
	Boys N=86	Girls N=231	Boys N=143	Girls N=166	Boys N=92	Girls N=161	Boys N=321	Girls N=538	Boys N=35	Girls N=3	Boys N=10	Girls N=0	Boys N=48	Girls N=0	Boys N=93	Girls N=03
Once	70 (81.4)	179 (77.5)	132 (92.3)	152 (91.6)	83 (90.2)	157 (97.5)	285 (88.8)	488 (87.5)	15 (42.9)	03 (100.0)	05 (50.0)	---	37 (77.1)	---	57 (61.3)	3 (100.0)
Twice	14 (16.3)	52 (22.5)	11 (7.7)	14 (8.4)	09 (9.8)	03 (1.9)	34 (10.6)	69 (12.4)	---	---	5 (50.0)	---	11 (22.9)	---	16 (17.2)	---
Trice	02 (2.3)	---	---	---	---	01 (0.6)	02 (0.6)	01 (0.2)	20 (57.1)	---	---	---	---	---	20 (21.5)	---
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

This suggests that schools in this study area provide no latrine facility whatsoever which forces students to use either neighbour's latrine near school or at home and bushes for urination and defecation.

The support of the above mentioned observation is further obtained from Table 36. Students using bushes were asked to identify the reasons for such preference. 85.0% of students using bushes complain that schools provide no latrine facilities at all. Another reason cited by the students is the habitual imitation of fellow mates for using bushes (15.0%).

Table 36: Preference of Bushes for Urination/Defection.

(% Distribution)

Reasons	Pre-Watsan N=13	Pre-SLE N=10	Control N=17	All Areas N=40
School Lacks Latrine	12 (92.3)	5 (50.0)	17 (100)	34 85.0
Used to Defecate in Bushes as Practiced by Others	1 (7.7)	5 (50.0)	--	6 (15.0)
Total	13 (100.0)	10 (100.0)	17 (100.0)	40 (100.0)

Perception of Students about Defecation at Bushes/Open Space and Latrine:

In order to determine student's perception and awareness about importance of latrine use vis a vis disadvantages, if any, of using bushes and open places for defecation. The study produce substantive responses which have been explained in Table 37. The results show that a larger portion of female students (54.9%) avoid use of open place and bushes for urination/defecation from the consideration of protection of privacy. It seems that concern for privacy looms no significant to the male students (20.2%).

At least 18.5% of female and 39.0% of male children could identify that feces and urine left at open surface may cause environmental pollution through transmission of germs. Such awareness is much higher among the male students (41.0%) compared to female children in all areas (Pre-Watsan, Pre-SLE and Control) around 26.0%. Female students are infavour of using latrine on-count of personal privacy as well as hygienic cleanliness.

Table 37: Perception of Students about Defecation in Open Space/Bushes and Latrine

(% Distribution)

Reasons for Preference of Specific Type	Pre-Watsan N=112		Pre-SLE N=119		Control N=120		All Areas N=351	
	Boys N=59	Girls N=53	Boys N=59	Girls N=60	Boys N=60	Girls N=60	Boys N=178	Girls N=173
Use of Bushes/Open Space for Defecation Entails Public Obscene and Loss of Privacy	10 (17.0)	32 (60.4)	12 (20.3)	35 (58.3)	14 (23.3)	28 (46.7)	36 (20.2)	95 (54.9)
Use of Bushes/Open Space Leads to Contamination of Germs and Leads to Environmental Pollution	26 (44.0)	09 (17.0)	23 (39.0)	13 (21.7)	20 (33.3)	10 (16.6)	69 (38.8)	32 (18.5)
Latrine Use Prevents Contamination of Germs and Protects Privacy	23 (39.0)	12 (22.6)	24 (40.7)	12 (20.0)	26 (43.4)	22 (36.7)	73 (41.0)	46 (26.6)
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Latrine Use Practice at Home:

Table 38(A) and 38(B) documents the latrine use practice of the students of individual sample at home. It can be observed that use of latrine, though, varies in kind between different types such as, water-seal, pucca, hanging, is in wide use. We have classified the types of latrine earlier into three categories namely sanitary (water-seal), semi-sanitary (pucca, open dug) and non-sanitary (bushes, open space and hanging latrines). The latrine practice of the respondents have also been assessed in terms of types of latrines the use for defecation and urination. A close look at the Table 38(A) produce a distinct pattern with regards to their latrine practices: one-fifth of all respondents are habituated to use sanitary latrine alone (19.1%). However, the proportion of female children using sanitary latrine is much higher (22.5%) as opposed to male children (15.7%). On the other hand only one-fourth of the total samples (25.6%) are used to practice semi-sanitary latrine. On the contrary majority of the total samples 55.3% prefer to defecate in non-sanitary latrine such as, bushes, open space and hanging type. Nonetheless the number of female students using bushes and open space are far lesser (49.7%) than their male counter part (61.0%). The same pattern is visible in all three study areas.

Table 39(B): Source of Motivation Towards Instalment of Latrine at Home

(% Distribution)

Classes	Classification of Schools	Sources of Motivation to Install Latrine			
		From Govt. (DPHE & School Teachers)	From NGO	From Relatives	Don't know
III	Pre-Watsan N = 191	22 (11.5)	-	126 (65.9)	43 (22.5)
	Pre-SLE N = 239	23 (9.6)	4 (1.7)	90 (37.7)	122 (51.0)
	Control N = 178	-	2 (1.1)	50 (28.1)	126 (7.8)
	Total N = 608	45 (7.4)	6 (1.0)	266 (43.8)	291 (47.9)
IV	Pre-Watsan N = 178	34 (19.1)	4 (2.2)	15 (8.4)	125 (70.2)
	Pre-SLE N = 174	10 (5.8)	-	29 (16.7)	135 (77.6)
	Control N = 153	-	-	95 (62.1)	58 (37.9)
	Total N = 505	44 (8.7)	4 (0.8)	139 (27.5)	318 (62.9)
V	Pre-Watsan N = 145	-	-	59 (40.7)	86 (54.3)
	Pre-SLE N = 153	-	-	71 (4.6)	82 (53.6)
	Control N = 121	3 (2.5)	-	28 (23.1)	90 (74.4)
	Total N = 419	3 (0.7)	-	158 (39.3)	258 (61.6)
All Classes N = 1532		92 (6.0)	10 (0.7)	563 (36.7)	867 (56.6)

Obstacles for Prevention of Open Defecation Practice:

Findings of this nature clearly indicate that appropriate hygiene behaviour related to defecation/urination can be meaningfully improved with the construction of sanitary latrine both at the schools and at home. The main constraints arise from the non-availability of sanitary latrine facilities in this community. Bushes using behaviour for defecation by the male students can be altogether altered if and when, sanitary latrine are installed at home and at school.

4.3.3. Hand Washing Practice:

Much of physical wellbeing depends largely on maintenance of daily personal bodily hygiene which include proper washing of hands before eating and after defecation, use of germ killing detergent like soap or minimally ash/soil after defecation with water, nail cutting at intervals, protecting feet with sandals while going to latrine or other contaminated places etc. From this perspective, an attempt was made to determine hygienic practices of students of the selected samples and in groups in view of the above mentioned health parameters. It has been reported by both sets of sample students [Table 40(A) and 40(B)] that all students without any exception wash their hands before eating and after defecation.

Table 40(A): Washing of Hands Before Eating and After Defecation

(% Distribution)

Classification of Schools	Hand Washing Practice	
	Wash Hands Before Eating	Wash Hands After Defecation
Pre-Watsan N = 112	112 (100.0)	112 (100.0)
Pre-SLE N = 119	119 (100.0)	119 (100.0)
Control N = 120	120 (100.0)	120 (100.0)
All Areas N = 351	100.0	100.0

In Table 41(B) which provides information on groups reveal that among students of class III, each category of practice such as (1) water + soap (2) water + ash/soil and (3) water only evenly accounts for hand washing (33% roughly in each category). Interestingly the user of water with ash/soil increased to 48% among students of class IV while those of user of water only decreased to 16% in the same group. The pattern found in students of class V as same as observed among students of class III.

Table 41(B): Materials Used for Washing Hand After Defecation

(% Distribution)

Classes	Classification of Schools	Hand Washing Practices Before Eating and After Defecation		
		Water and Soap	Water and Ash/Soil	Water Only
III	Pre-Watsan N = 191	45 (23.6)	73 (38.2)	73 (38.2)
	Pre-SLE N = 239	97 (40.6)	73 (30.5)	69 (28.9)
	Control N = 178	58 (32.6)	53 (29.8)	67 (37.6)
	Total N = 608	200 (32.9)	199 (32.8)	209 (34.4)
IV	Pre-Watsan N = 178	66 (37.1)	77 (43.2)	35 (19.7)
	Pre-SLE N = 174	32 (18.4)	115 (66.1)	27 (15.5)
	Control N = 153	82 (53.6)	52 (34.0)	19 (12.4)
	Total N = 505	180 (35.6)	244 (48.4)	81 (16.0)
V	Pre-Watsan N = 145	45 (31.0)	67 (46.2)	33 (22.8)
	Pre-SLE N = 153	45 (29.4)	68 (44.5)	40 (26.1)
	Control N = 121	49 (40.5)	20 (16.5)	52 (43.0)
	Total N = 419	139 (33.2)	155 (37.0)	125 (29.8)
All Classes N = 1532		519 (33.9)	778 (50.8)	415 (27.1)

Table 40(B): Washing of Hands Before Eating and After Defecation

Hand Washing Practice	Classes			All Classes N = 1532
	III N = 608	IV N = 505	V N = 419	
Wash Hands Before Eating	608 (100.0)	505 (100.0)	419 (100.0)	100.0
Wash Hands After Defecation	608 (100.0)	505 (100.0)	419 (100.0)	100.0

Nonetheless it is more important to probe further on the materials whether used while washing hands after defecation. Table 41(A) indicates that nearly half of the total respondents (44.4%) use water only for cleaning hand after defecation. A substantial number of the students use water with ash/soil after defecation (42.2%). Only 13% have reported to using water with soap. This implies that possibility for contaminated hands leading to diarrhoeal and stomach ache related disorder remain excessively high.

Table 41(A): Materials Used for Washing Hand After Defecation

(% Distribution)

Hand Washing Practices After Defecation	Classification of Schools			
	Pre-Watson N=112	Pre-SLE N=119	Control N=120	All Areas N=351
Water Only	52 (46.4)	49 (41.2)	55 (45.81)	156 (44.4)
Water and Soap	17 (15.2)	16 (13.4)	14 (11.7)	47 (13.4)
Water With Ash/Soil	43 (38.4)	54 (45.4)	51 (42.5)	148 (42.2)

According to our survey data as presented in Table 42(A), 6 in every 10 students in general are used to washing of both hands before eating and after defecation. However, the female students are more conscious about this behaviour (67.1%) compared to their male counterpart (55.1%).

Table 42(A): Whether Wash Both Hands Before Eating and After Defecation

(% Distribution)

Classification of Schools	Wash Both Hands Before Eating and After Defecation		
	Boys	Girls	Both Sexes
Pre-Watsan MN=59 FN=53 TN=112	34 (57.6)	32 (60.4)	66 (58.9)
Pre-SLE MN=59 FN=60 TN=119	33 (55.9)	45 (75.0)	78 (65.5)
Control MN=60 FN=60 TN=120	31 (51.7)	39 (65.0)	70 (58.3)
All areas MN=178 FN=173 TN=351	98 (55.1)	116 (67.1)	214 (61.0)

Turning to the Table 42(B) a clear pattern is discernable that the practice of both hand washing is substantially high among class V students (83.3%) and is lower consistently among lower grades (48.7% in class IV and 34.9% in class III).

Table 42(B): Whether Wash Both Hands Before Eating and After Defecation
(% Distribution)

Classes	Classification of Schools	Hand Washing Practices Before Eating and After Defecation
III	Pre-Watsan N = 191	69 (36.1)
	Pre-SLE N = 239	103 (43.1)
	Control N = 178	40 (22.5)
	Total N = 608	212 (34.9)
IV	Pre-Watsan N = 178	42 (23.6)
	Pre-SLE N = 174	93 (51.7)
	Control N = 153	114 (74.5)
	Total N = 511	249 (48.7)
V	Pre-Watsan N = 145	117 (80.7)
	Pre-SLE N = 153	123 (80.4)
	Control N = 121	109 (90.1)
	Total N = 419	349 (83.3)
All Classes N = 1532		810 (52.9)

Obstacles for Prevention of Students from Changing Their Hand Washing Practice:

The implication of this findings suggest that socialization of minor children on the importance of washing of both hands should be emphasized both at the parental level and at the school level. The growing children need to be reoriented to the danger of health risk associated with unclean hands atleast before eating and defecation. In order to change their existing unhygienic hand washing practice provision for storage of adequate water at home and at latrine need to be installed so that minor children have access to water for hand washing.

4.3.4. Practices of Sandal Wearing:

The practice of sandal wearing among the students was recorded on the basis of direct observation on the day of survey. It was found that close to 56% in all areas was wearing sandals on that day. The proportion of female students compared to male students was appreciably higher (64.2% and 46.6% respectively), as illustrated in Table 43(A).

Table 43(A): Practices of Sandal Wearing (% Distribution)

Classification of Schools	Practices of Sandal Wearing		
	Boys	Girls	Total
Pre-Watsan TN=112 MN=59 FN=53	22 (37.3)	28 (52.8)	50 (44.6)
Pre-SLE TN=119 MN=59 FN=60	26 (44.1)	37 (61.7)	63 (52.9)
Control TN=120 MN=60 FN=60	35 (58.3)	46 (76.7)	81 (67.5)
All Areas TN=351 MN=178 FN=173	83 (46.6)	111 (64.2)	194 (55.3)

On group level it was found that the wearing of sandals is positively related to class dichotomy. The number of students using sandals increased from 39% in class III to 40% in class IV and finally to 52% in class V. This implies that the students of higher grades have greater consciousness about the use of sandals in comparison with the students in lower grades.

Table 43(B): Practices of Sandal Wearing

		(% Distribution)
Classes	Classification of Schools	Practices of Sandal Wearing
III	Pre-Watsan N = 191	105 (55.0)
	Pre-SLE N = 239	59 (24.7)
	Control N = 178	74 (41.6)
	Total N = 608	238 (39.1)
IV	Pre-Watsan N = 178	54 (30.3)
	Pre-SLE N = 174	71 (40.8)
	Control N = 153	78 (51.0)
	Total N = 505	203 (40.2)
V	Pre-Watsan N = 145	75 (51.7)
	Pre-SLE N = 153	75 (49.0)
	Control N = 121	68 (56.2)
	Total N = 419	218 (52.0)
All Classes N = 1532		659 (43.0)

Table 44 analyzes the reasons, as perceived by the students for wearing of sandals. Sample students identified three major reasons for the practice of sandal wearing which are described here according to the importance perceived by the students : 67.5% of the students mentioned "physical comfort and cleanliness as the cause for using sandals". Little more than one-fourth wear sandals as a "protection against injury". Only 5.2% of the students could attribute sandal wearing as a "protective measure against germs and diseases". Survey on students in group yielded almost an identical views without any variation with regard to the causes for wearing sandals (as such no separate tabular presentation was considered necessary).

Table 44: Reasons for Wearing Sandal

(% Distribution)

Reasons for Wearing Sandal	Classification of Schools			
	Pre-Watsan N=50	Pre-SLE N=63	Control N=81	All Areas N=194
For Physical Comfort and Cleanliness	22 (44.0)	47 (74.6)	62 (76.5)	131 (67.5)
For Protection Against Injury	25 (50.0)	14 (22.2)	14 (17.3)	53 (27.3)
Protection Against Germs and Diseases	3 (6.0)	2 (3.2)	5 (6.2)	10 (5.2)

Table 45(A) examines sandal wearing practice of the both male and female children while going to latrine. On an average 35% of male and female children in all areas normally wear sandals while going to latrine. However, there is a slight discrepancy between male and female children so far as this practice is concerned. Female children are relatively careful about hygienic practice of sandal wearing during latrine use (40%) which is markedly lower among the male counterpart (30%). If we look at the three study areas separately, female children of Pre-Watsan area are found to be unevenly much higher (47%) compared with that of Pre-SLE and Control areas (around 36%). On the contrary male children are much indifferent to use wearing sandals in latrine particularly those of Control area (26%). This clearly manifest that sandal wearing practice varies significantly along sex dimension. That is female children show more positive behaviour than the male children.

Table 45(A): Whether Wear Sandals While Going to Latrine

(% Distribution)

Classification of Schools	Wear Sandals While Go to Latrine		
	Boys	Girls	Both Sexes
Pre-Watsan TN=112 MN=59 FN=53	20 (33.9)	25 (47.2)	45 (40.2)
Pre-SLE TN=119 MN=59 FN=60	18 (30.5)	21 (35.0)	39 (32.8)
Control TN=120 MN=60 FN=60	16 (26.7)	23 (38.3)	39 (32.5)
All Areas TN=351 MN=178 FN=173	54 (30.3)	69 (39.9)	123 (35.0)

Turning to group respondents, as presented in Table 45(B), we obtained a visible trend of increasing practice of sandal wearing in latrine use. Students of higher class (class V) are more prone to wear sandals for latrine use (40.3%) compared to lower grades, such as class III and IV, (around 39%). This behavioural variation may be attributed to the impact of health message and contents included in their curriculum.

Table 45(B): Whether Wear Sandals While Going to Latrine (% Distribution)

Classes	Classification of Schools	Wear Sandals While Going to Latrine
II	Pre-Watsan N = 191	68 (35.6)
	Pre-SLE N = 239	81 (33.9)
	Control N = 178	88 (49.4)
	Total N = 608	237 (39.0)
IV	Pre-Watsan N = 178	59 (33.1)
	Pre-SLE N = 174	79 (45.4)
	Control N = 153	58 (37.9)
	Total N = 505	196 (38.8)
V	Pre-Watsan N = 145	60 (40.0)
	Pre-SLE N = 153	58 (37.9)
	Control N = 121	51 (42.1)
	Total N = 419	169 (40.3)
All Classes N = 1532		602 (39.2)

Perception of Students about the Benefits of Sandal Use in Latrine:

Students perception on the benefits of wearing sandals in latrine use was investigated and the findings in this regard are presented in Table 46. It should be noted that the views of those students were recorded who were found to have the practice of sandal wearing in latrine (N=123).

The respondents have identified 3 major reasons firstly "to keep feet safe from excreta (34%)", secondly "to secure personal hygiene (24.4%)", and thirdly "protection against germs and diseases (20%)". One-fifth of the students who use sandals in latrine could not provide any convincing reasons (21%). Reasons shown by the respondents in group did not vary significantly from the Table 46. The group data exhibited a similar pattern of responses. The data in this table reveal that the students awareness of the benefits of the deworming is very minimal. Only one in every five students seems to be conscious about the relationship between sandals wearing and deworming (particularly in relation to hookworm, worm infestation etc.).

Table 46: Perceived Reasons for Using Sandals While Going to Latrine

(% Distribution)

Reasons for Washing Sandals While Going to Latrine	Classification of Schools			
	Pre-Watsan N=45	Pre-SLE N=39	Control N=39	All Areas N=123
To Keep Feet Safe From Excreta	15 (33.3)	13 (33.3)	14 (35.9)	42 (34.1)
Protection Against Germs and Diseases	12 (26.7)	7 (18.0)	6 (15.4)	25 (20.3)
To Secure Personal Hygiene	10 (22.2)	9 (23.1)	11 (28.2)	30 (24.4)
Could Not Identify	8 (17.8)	10 (25.6)	8 (20.5)	26 (21.2)

4.3.5. Nail-Cutting Practice:

It is well recognized by the health professionals that long and unclean nails often carry germs of various kind which may be passed into the body while eating, thus causing serious diseases. From this view point regular nail-cutting practice may be considered as a preventive measure against stomach related disorder. The health message in the books are supposed to make students conscious about the danger of prolonged non-cutting of nails. Some schools in the study area often supply nail clippers to the students at regular intervals. Table 47(A) elaborates nail-cutting practice of the students with nail clippers. It may be observed that only 40.5% of the children use nail clippers for cutting nails in all areas, while 60.0% respondents cut their nails by other means such as, blade, knife etc.

Table 47(A): Nail Cutting Practice With Nail Clippers

Classification of Schools	(% Distribution)	
	Cut Nail With Nail Clippers	Cut Nails with other Means
Pre-Watsan N=112	44 (39.3)	68 (60.7)
Pre-SLE N=119	48 (40.3)	71 (59.7)
Control N=120	40 (33.3)	80 (66.7)
All Areas N=351	142 (40.5)	209 (59.5)

Students examined in group, however, show that around 62.0% students use nail clippers for cutting nails [(Table 47(B)]. The use of nail clippers by students of class V is relatively higher (70.0%) compared to class III (63.8%) and class IV (53.0%).

Table 47(B): Nail Cutting Practice With Nail Clippers (In Groups).

(% Distribution)

Classes	Cut Nails With Nail Clippers
Class III N=608	388 (63.8)
Class IV N=505	268 (53.1)
Class V N=419	290 (69.2)
All Classes N=1532	946 (61.7)

It was felt important to examine that how often do the students cut their nails regularly. Therefore to determine the frequency of nail cutting, three categories of time scale was taken into consideration: (i) whether they cut their nails at close intervals (once a week), (ii) at moderate intervals (fortnightly), (iii) at longer intervals (beyond two weeks time). Table 48(A) and 48(B) depict the frequency of nail cutting practice both in individual samples and in group respondents respectively. Nearly fifty percent of the students cut their nails at moderate intervals (fortnightly) which implies that half of the samples are used to have long nails. Only forty percent nonetheless are alert about cutting their nails at shorter intervals (once a week). One in every ten students is callous about keeping their nails to be longer since they cut their nails at irregular intervals (more than two weeks).

Table 48(A): Whether Nails are Cut Regularly or Irregularly

(% Distribution)

Frequency of Nail Cutting	Classification of Schools			
	Pre-Watsan N=112	Pre-SLE N=119	Control N=120	All Areas N=351
Once a Week	46 (41.1)	42 (35.3)	57 (47.5)	145 (41.3)
Fortnightly	58 (51.8)	54 (45.4)	58 (48.3)	170 (48.4)
More Than Two Weeks	8 (7.1)	23 (19.3)	5 (4.2)	36 (10.3)

It is curious to find that the proportion of students who cut their nails at longer intervals is pervasively higher among the class III students (around 14.0%). The corresponding figure for class IV and class V is strikingly lower (around 3.0%). On the whole the 46.0% of the respondents either cut their nails once a week or atleast fortnightly. Students of class V seem to be more aware about the importance of nail cutting practice compared to lower class students. More than 50.0% of the class V students normally cut their nails once a week.

Table 48(B): Whether Nails are Cut Regularly or Irregularly (In Groups)

(% Distribution)

Classes	Frequency of Nail Cutting		
	Once a Week	Fortnightly	More Than Two Weeks (Longer Interval)
Class III N=608	270 (44.4)	254 (41.8)	84 (13.8)
Class IV N=505	232 (46.0)	258 (51.1)	15 (3.0)
Class V N=419	213 (50.8)	195 (46.6)	11 (2.6)
All Classes N=1532	715 (46.7)	707 (46.1)	110 (7.2)

Students Perception of the Importance of Nail Cutting Practice:

In order to assess students' awareness of the importance of nail cutting the respondents were asked to specify the consequences of keeping long nails (cutting nails at two weeks' intervals). Results obtained from the study (Table 49) show that nearly 50.0% of the students are unaware of the harmful effects of long nails. They cut their nails mostly on reasons for avoidance of public criticism. Nonetheless 29.0% of all respondents could explain that some diseases are caused by germ contaminated long nails. The corresponding figure rose to 32.0% in Pre-SLE area showing higher consciousness in that group. On the other hand more than one-fifth of the total respondents (22.8%) have no knowledge of the effect of nail cutting on disease causation (such as diarrhoea).

Table 49: Awareness of the Importance of Nail Cutting by Students

(% Distribution)

Awareness of the Importance of Nail Cutting by Students	Classification of Schools			
	Pre-Watsan N=112	Pre-SLE N=119	Control N=120	All Areas N=351
Long Nails Causes Diseases	33 (29.5)	38 (32.0)	29 (24.2)	100 (28.5)
Long Nails are Publicly Hated	51 (45.5)	56 (47.1)	64 (53.3)	171 (48.7)
No Responses	28 (25.0)	25 (21.0)	27 (22.5)	80 (22.8)

This suggests that (i) students should be properly educated at school for regular nail cutting at shorter intervals, (ii) students should be made conscious that unclean long nails may lead to diarrhoeal diseases and (iii) schools should provide sufficient nail clippers to the students for regular nail cutting as part of their educational programme.

CHAPTER FIVE

CORRELATION ANALYSIS

The present section provides correlational analysis: i) between morbidity of diseases and hygiene behaviour, ii) between morbidity of diseases and hygiene facilities at home, and iii) between hygiene behaviour and hygiene facilities availability at home.

The correlation was determined by cross-tabulation using bivariate analysis and the strength of relationship was measured by using chi-square statistic. The results obtained from chi-square test when produced P-value below .05 was accepted as proof of statistical evidence in support of observed relationship. While chi-square result having P-value more than .05 was rejected as the null-hypothesis i.e., bearing no relationship between the variables under statistical test.

5.1 CORRELATION BETWEEN MORBIDITY OF DISEASES AND HYGIENE BEHAVIOUR

An attempt was made to findout the determinants of morbidity of certain diseases among the study children [namely, diarrhoea, stomach ache (with hookworm), skin diseases and eye diseases] as caused by hygienic behaviour (such as hand washing practices, frequency of nail cutting, latrine practice at home, sandal wearing practices at latrine). In other words the hygienic behaviour parameters are treated here as independent variables while morbidity of diseases as dependent variables.

5.1.1 Diarrhoea and Stomach Ache by Hygienic Practices:

Table 50 examines the correlationship of the incidence of diarrhoeal disease as well as stomach ache (with hookworm) with hand washing practice (both hands) after defecation and before eating. It can be seen from this table that those children who avoids hand washing (both hands) after defecation and before eating suffered from diarrhoeal disease (26.2%) and stomach ache (32.8%) in higher proportions compared to those who washed both hands before eating and after defecation (17.4% for diarrhoea) and (22.2% for stomach ache).

Table 50: Incidence of Diarrhoea and Stomach Ache By Hand Washing Practices (Both Hands) (% Distribution)

Hand Washing Practices (Both Hands) After Defecation & Before Eating	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Wash Both Hands N=214	61 (17.4)	153 (13.6)	78 (22.2)	136 (38.7)
Don't Wash Both Hands N=137	92 (26.2)	45 (12.8)	115 (32.8)	22 (6.3)
$X^2 = 50.74, df = 1, P = <.001$			$X^2 = 76.1, df = 1, P = <.001$	

This means that hand washing practice bears causal relationship with the incidence of diarrhoea and stomach ache. The chi-square results in both types of diseases show that observed differences are highly significant at .001 level.

It is pertinent that materials used for hand washing both after defecation and before eating can affect health and disease to a great extent which has been scrutinized in Table 51. In rural settings poor households cannot afford to have costly detergents like soap for hand washing in each occasion. It is assumed that water alone without the use of soap is not adequate to clean the hand and body in proper hygienic term. Consequently hands can remain contaminated. When water is only used or washed with water with ash/soil.

The burden of diarrhoeal disease and stomach ache is observed higher among those students who use either water only (15.4% for diarrhoea) and (25.1% for stomach ache). The incidences of diarrhoea and stomach ache are relatively lower among the children who use water with soap close to 10.0%. On the other hand, only 18.2% and 20.8% of the children having suffered from diarrhoea and stomach ache respectively resorted to the practice of water with soil and ash. The risk of unclean hands remain excessively high for diarrhoeal attack as well as stomach ache problem. The results produced by χ^2 -test was found to be highly significant at .001 level for diarrhoea and moderately significant for stomach ache ($P < .01$). It suggests that there is a correlation between materials used for washing practice and incidence of diarrhoea and stomach ache.

Table 51: Incidence of Diarrhoea and Stomach Ache By Materials Used for Washing Hands
(% Distribution)

Materials Used for Washing Hands after Defecation	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Water Only N=156	54 (15.4)	102 (29.1)	88 (25.1)	68 (19.4)
Water and Soap N=47	35 (10.0)	12 (3.4)	32 (9.1)	15 (4.3)
Water with Soil/Ash N=148	64 (18.2)	84 (23.9)	73 (20.8)	75 (21.4)
$\chi^2 = 23.34, df = 2, P = <.001$			$\chi^2 = 5.65, df = 2, P = <.01$	

Table 52 records findings on the relationship of diarrhoeal disease and stomach ache with frequency of nail cutting. From medical point of view nail cutting at shorter interval (once a week at least) should prevent the transmission the germs against diseases like diarrhoea, stomach ache etc. as opposed to nail cutting at longer intervals (more than a week). Our survey data produced evidence in support of this observation. The proportion of diarrhoeal attack was markedly higher among students who have the practice of nail cutting at longer intervals (25.6%) compared to those who have the practice of cutting nails at shorter intervals (17.9). The prevalence of stomach ache among this student category maintains the same pattern (30.5%) of morbidity rate from stomach ache. The corresponding rate of morbidity relating to stomach ache is also observed lower among those having shorter intervals in nail cutting practice (24.5%). However, the obtained results was not validated by the chi-square test both in relation to diarrhoea and stomach ache. Chi-square values showed non-significant statistical relationship.

Table 52: Incidence of Diarrhoea and Stomach Ache By Frequency of Nail Cutting Practices (% Distribution)

Frequency of Nail Cutting	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
At Shorter Interval (Once a Week) N=145	63 (17.9)	82 (23.4)	86 (24.5)	59 (16.8)
At Longer Interval (More than One Week) N=206	90 (25.6)	116 (33.0)	107 (30.5)	99 (28.2)
$X^2 = 0.002, df = 1, P = < .07$			$X^2 = 1.86, df = 1, P = < 2.1$	

The correlation of the incidences of diarrhoeal disease and stomach ache with latrine practice at home, as illustrated in Table 53, reveal that the prevalence of diarrhoeal disease is distributed as below in terms of latrine practice at home. Only 9.1% of students having diarrhoea have been using sanitary latrine at home while about 34.5% of children who suffered from diarrhoea are used to have the practice of defecating at semi-sanitary latrines and purely non-sanitary latrines. On the other hand, stomach ache is limited to only 11.4% who are using sanitary latrines. 43.6% of the children having hookworm related stomach ache are reported to be using semi-sanitary and non-sanitary latrines like hanging, bushes and open spaces. From the statistical point of view the differences in the usage of sanitary, semi-sanitary and non-sanitary latrines bear no association with diarrhoea and stomach ache since the obtained figures could not pass the required level of statistical significance.

Table 53: Incidence of Diarrhoea and Stomach Ache By Latrine Practice at Home
(% Distribution)

Latrine Practice at Home	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Sanitary Latrine Water-Seal N=67	32 (9.1)	35 (10.0)	40 (11.4)	27 (7.7)
Semi-Sanitary Latrine (Pucca, Open Dug) N=90	40 (11.4)	50 (14.2)	55 (15.7)	35 (10.0)
Non-Sanitary Latrine (Hanging, Bushes, Open Space) N=194	81 (23.1)	113 (32.2)	78 (27.9)	94 (27.4)
$\chi^2 = 0.78, df = 2, P = <.08$			$\chi^2 = 3.53, df = 2, P = <.2$	

It is apparent that defecating at open places, bushes or other unhygienic non-sanitary latrines tend to expose minor children to the high risk of hookworm related intestinal disorder and diarrhoeal diseases.

From this consideration sandal wearing protects individuals from the intestinal disorders in large measure and to, a lesser extent, from diarrhoeal attack. Table 54 produced evidential support to our above mentioned findings. Students who are not using sandals in latrine became victims of diarrhoea and stomach ache in equal proportion (around 27.0%). Contrarily the prevalence of diarrhoea and stomach ache is restricted to only 16.2% and 27.1% respectively among the users of sandals in latrine use. The fact that sandal wearing is correlated with stomach ache in particular, is supported by χ^2 -test.

The relationship was found to be highly significant at .001 level. Where as the causal relationship between sandal wearing and diarrhoeal incidence seems to be indirect (results are not statistically significant).

Table 54: Incidence of Diarrhoea and Stomach Ache By Sandal Wearing Practice in Latrine (% Distribution)

Sandal Wearing Practice in Latrine	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Wear Sandals in Latrine N=123	57 (16.2)	66 (18.8)	95 (27.1)	28 (8.0)
Don't Wear Sandals in Latrine N=228	96 (27.4)	132 (37.6)	98 (27.9)	130 (37.0)
$\chi^2 = 0.59, df = 1, P = <.1$			$\chi^2 = 37.87, df = 1, P = <.001$	

5.1.2 Skin Disease and Eye Disease by Hygienic Practices:

Hygienic uncleanliness may often lead to several other diseases, such as, skin and eye disease among others. Rashes, boils, scabies frequently are developed by individuals who are less concerned about washing both hands at least after defecation/urination and of course before eating. The minor children seem to be extremely ignorant or unaware of the adverse health effect of unclean and contaminated hands. This is impart true about eye disease/infection. Our analysis to this regard, as presented in Table 55, shows very positive correlation between the incidences of skin and eye disease and hand washing practices (both hands).

Table 55: Incidences of Skin Diseases and Eye Diseases By Hand Washing Practices (Both Hands)

(% Distribution)

Hand Washing Practices (Both Hands) After Defecation & Before Eating	Incidence of Skin Diseases		Incidence of Eye Diseases	
	Had Skin Diseases N=60	Had No Skin Diseases N=291	Had Eye Diseases N=75	Had No Eye Diseases N=276
Wash Both Hands N=214	25 (7.1)	189 (53.8)	12 (3.4)	202 (57.5)
Don't Wash Both Hands N=137	35 (10.0)	102 (29.1)	63 (18.0)	74 (21.0)
$X^2 = 11.35, df = 1, P = <.001$			$X^2 = 81.03, df = 1, P = <.001$	

Children who never wash both hands after defecation and before eating had higher incidence of skin disease (10.0%) and eye disease (18.0%) compared to those who washed both hands (7.0% and 3.4% respectively). The observed differences in the occurrences of skin and eye diseases in relation to hand washing practices are found to be highly statistically significant (validated by χ^2 -test having .001 level of significance for both kinds of diseases). This suggests that hand washing practice bears meaningful causal relationship with skin and eye diseases. Nonetheless we could not find any correlation between the incidences of skin and eye diseases and materials used for washing hands. Hence no tabular presentation was considered necessary.

Table 56 focused on the incidences of skin and eye diseases as affected by frequencies of nail cutting practice. A close look at the figures in Table 56 shows that nail cutting at shorter intervals vis-a-vis longer intervals reduces the occurrence of skin and eye diseases to a greater extent. The ratio of students having longer nails and shorter nails suffering from skin and eye diseases is approximately 3:1. It can be observed that 13.4% of the students who suffered from skin diseases used to cut their nails at longer intervals while only 3.7% of the students having skin disease cut their nails once a week. The higher incidence of eye disease pervasively dominants among students having practice of nail cutting at longer intervals (15.4%) as opposed to students under 'shorter in interval' category (6.0%).

However, the correlation between skin disease and frequency of nail cutting practice received strong statistical support in χ^2 -test, P-value being significant at .001 level. On the other hand, the observed relationship between the incidence of eye disease and nail cutting practice stands at very moderate level of statistical significance (P-Value = <.01).

Table 56: Incidences of Skin Disease and Eye Disease By Frequency of Nail Cutting Practices
(% Distribution)

Frequency of Nail Cutting	Incidences of Skin Disease		Incidences of Eye Disease	
	Had Skin Disease N=60	Had No Skin Disease N=291	Had Eye Diseases N=75	Had No Eye Disease N=276
At Shorter Interval (Once a Week) N=145	13 (3.7)	132 (37.6)	21 (6.0)	124 (35.3)
At Longer Interval (More than One Week) N=206	47 (13.4)	159 (45.3)	54 (15.4)	152 (43.3)
$\chi^2 = 11.52, df = 1, P = <.001$			$\chi^2 = 6.99, df = 1, P = <.01$	

Summary of Findings
Morbidity of Diseases and Hygienic Practices
(Correlational Analysis)

Strength of Causal Relationship		χ^2 -Value	P-Value
Diarrhoea	Diarrhoea and Hand Washing Practice	50.74	<.001**
	Diarrhoea and Materials Used for Hand Washing	23.34	<.001**
	Diarrhoea and Frequency of Nail Cutting Practice	0.002	<.07 ^{ns}
	Diarrhoea and Latrine Practice at Home	0.78	<.08 ^{ns}
	Diarrhoea and Sandal Wearing Practice	0.59	<.1 ^{ns}
Stomach Ache	Stomach Ache and Hand Washing Practice	76.1	<.001**
	Stomach Ache and Materials Used for Hand Washing	5.65	<.01*
	Stomach Ache and Frequency of Nail Cutting Practice	1.86	<2.1 ^{ns}
	Stomach Ache and Latrine Practice at Home	3.53	<.2 ^{ns}
	Stomach Ache and Sandal Wearing Practice	37.87	<.001**
Skin Disease	Skin Disease and Hand Washing Practice	11.35	<.001**
	Skin Disease and Frequency of Nail Cutting Practice	11.52	<.001**
Eye Disease	Eye Disease and Hand Washing Practice	81.03	<.001**
	Eye Disease and Frequency of Nail Cutting Practice	6.99	<.01*

** = Highly Statistical Significant
* = Moderately Statistical Significant
ns = Not-Significant

5.2 CORRELATION BETWEEN MORBIDITY OF DISEASES AND HYGIENE FACILITIES AVAILABILITY AT HOME

It is presumed that hygienic facilities availability at home may influence the occurrence of diarrhoea, stomach ache, skin and eye diseases to some degree. Hygiene facilities such as, types of latrine at home, time taken to reach the source of water from latrine, storage provision of water near latrine and latrine cleanliness are taken as key independent variables in relation to the diseases mentioned above.

Discussions below will focus upon whether the presence or absence of such hygiene facilities at home have considerably contributed or not to above mentioned diseases.

5.2.1. Diarrhoea and Stomach Ache as Affected by Availability of Hygiene Facilities at Home :

Table 57 furnishes data on the incidences of diarrhoea and stomach ache by types of latrine facility available at home. Households having non-sanitary latrine accounted for 24.5% of diarrhoeal disease stricken children while those households having sanitary latrines claimed only one-fourth (6.3%) of the total children suffering from diarrhoea. Little more than half of all children suffering from diarrhoea come from households possessing semi-sanitary latrines at home. The relationship of diarrhoea with the types of latrines seems to be positively correlated, showing high level of statistical significance in X^2 -test (.001). On the other hand, such relationship does not hold with regard to stomach ache problem. The differences observed among children with diarrhoea having sanitary, semi-sanitary and non-sanitary latrines at home is found statistically non-significant. Yet the incidence of stomach ache is highly concentrated in the families which possess non-sanitary and semi-sanitary latrines (46.2%) in comparison with families equipped with sanitary latrine (8.8%).

Table 57: Incidence of Diarrhoea and Stomach Ache (With Hookworm) By Latrine Availability at Home

(% Distribution)

Types of Latrine Availability at Home	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Sanitary Latrine (Water-seal) N=71	22 (6.3)	49 (14.0)	31 (8.8)	40 (11.4)
Semi-Sanitary Latrine (Pucca, Open Dug) N=123	45 (12.8)	78 (22.2)	76 (21.7)	47 (13.4)
Non-Sanitary Latrine (Hanging, Bushes & Open Space) N=157	86 (24.5)	71 (20.2)	86 (24.5)	71 (20.2)
$X^2 = 15.03, df = 2, P = <.001$			$X^2 = 5.98, df = 2, P = <.1$	

It may be postulated that the location of water source from the latrine may operate as an intervening variable in the causation of both diarrhoea and stomach ache. It is likely that when the location of water source from the latrine takes longer walk (more than 5 minutes), there will be a concomitant behaviour to use inadequate water for latrine use. The nearness of the location may encourage the opposite behaviour that is using sufficient water after latrine use. From Table 58 we can see that among the students who suffered from the incidence of diarrhoea require more than 5 minutes walk to fetch water for latrine use (13.1% as opposed to 30.5%). Water source located near the house had only 13.1% of children suffering from diarrhoea. The correlation between diarrhoea and the source of water from latrine displayed a moderate degree of statistical significance ($P = <.01$).

However, in case of stomach ache the observed relationship is found further weaker ($P < .02$). In other words the location of the source of water no matter near or far does not directly intervene with the incidence of stomach ache.

Table 58: Incidence of Diarrhoea and Stomach Ache By Distance of Source of Water from Latrine

(% Distribution)

Time Taken to Reach the Source of Water	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Near (Less than 5 Minutes) N=167	46 (13.1)	121 (34.5)	91 (25.9)	76 (21.7)
Far (More than 5 Minutes) N=184	107 (30.5)	77 (21.9)	102 (29.1)	82 (23.3)
$X^2 = 8.96, df = 1, P < .01$			$X^2 = 6.15, df = 1, P < .02$	

Admittedly water storage near latrine exerts greater effect on the incidences of diarrhoea and stomach ache since availability of water at hand allows the users proper facility for bodily cleanliness. Such facility exists very minimally in rural households. From the data given in Table 59, one can find that the storage provision of water attributed to only 17.7% of diarrhoea and 6.0% of stomach ache. Conversely about 50.0% of children with stomach problem and 25.9% of children having diarrhoeal disorder belong to families which lack no provision of water storage near latrine. X^2 -test produced highly significant results, P-Value approaching at .001 level for both diarrhoea and stomach ache in relation to water transport.

Table 59: Incidence of Diarrhoea and Stomach Ache By Water Transport

(% Distribution)

Storage of Water	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Provision for Water Storage Near Latrine N=73	62 (17.7)	11 (3.1)	21 (6.0)	52 (14.8)
No Provision for Water Storage Near Latrine N=278	91 (25.9)	187 (53.3)	172 (49.0)	106 (30.2)
$X^2 = 64.08, df = 1, P = <.001$			$X^2 = 25.60, df = 1, P = <.001$	

Table 60 examines the incidences of diarrhoea and stomach ache from the view-point of latrine cleanliness. The underlying assumption is that latrines cleaned on regular basis are likely to be less hazardous for health (diarrhoea and stomach ache) than those latrines which are uncleaned or where feces and excretes remain exposed for bodily contact. However, the present survey failed to show association between latrine cleanliness and the incidences of diarrhoea and stomach ache. X^2 -test did not show any statistically significant relationship between these two variables.

Table 60: Incidence of Diarrhoea and Stomach Ache By Home Latrine Cleanliness

(% Distribution)

Latrine Cleanliness	Incidence of Diarrhoea		Incidence of Stomach Ache (With Hookworm)	
	Suffered from Diarrhoea N=153	Had No Diarrhoea N=198	Suffered from Stomach Ache N=193	Had No Stomach Ache N=158
Clean Latrine (Regularly Cleaned) N=168	78 (22.2)	90 (25.6)	91 (25.9)	77 (21.9)
Unclean Latrine (Casually Cleaned) N=183	75 (21.4)	108 (30.8)	102 (29.1)	81 (23.1)
$X^2 = 1.06, df = 1, P = <.07$			$X^2 = 0.09, df = 1, P = <.2$	

5.2.2 Incidences of Skin Disease and Eye Disease as Affected by Hygiene Facilities Availability at Home:

We have attempted to find out (a) whether the types of latrine facilities at home bears any causal relationship with the incidence of skin disease (Table 61) and (b) whether cleanliness of latrine affects the incidence of skin disease and eye disease (Table 62).

Table 61: Incidence of Skin Diseases By Types of Latrine Facility at Home

(% Distribution)

Types of Latrine Facility at Home	Incidence of Skin Disease	
	Had Skin Disease N=60	Had No Skin Disease N=291
Sanitary Latrine (Water-seal) N=71	12 (3.4)	59 (16.8)
Semi-Sanitary Latrine (Pucca, Open Dug) N=123	23 (6.6)	100 (28.5)
Non-Sanitary Latrine (Hanging, Bushes & Open Space) N=157	25 (7.1)	132 (37.6)
$\chi^2 = 0.38, df = 2, P = <.3$		

The differences that have been observed between the occurrence of skin disease and the types of latrine on the one hand and the nature of cleanliness of the latrine with the occurrences of eye diseases on the other, produced X^2 results beyond required level of statistical significance. This suggests that types of latrine and latrine cleanliness are not correlated with the incidence of eye disease. However, in case of skin disease the observed relationship between the latrine cleanliness and skin disease is found to be highly correlated ($P < .001$)

Table 62: Incidence of Skin and Eye Disease By Home Latrine Cleanliness

(% Distribution)

Latrine Cleanliness	Incidence of Skin Disease		Incidence of Eye Disease	
	Had Skin Disease (N=60)	Had No Skin Disease (N=291)	Had Eye Disease (N=75)	Had No Eye Disease (N=276)
Clean Latrine N=168	22 (6.0)	146 (41.6)	37 (10.5)	131 (37.3)
Unclean Latrine N=183	38 (10.8)	145 (41.3)	38 (10.8)	145 (41.3)
$\chi^2 = 58.42, df = 1, P = <.001$			$\chi^2 = 0.28, df = 1, P = <.09$	

Summary of Findings
Morbidity of Diseases and Hygiene Facilities Availability at Home
(Correlational Analysis)

Strength of Causal Relationship		x ² -Value	P-Value
Diarrhoea	Diarrhoea Incidence and Types of Latrine Availability at Home	15.03	<.001**
	Diarrhoea Incidence and Distance of Source of Water from Latrine	8.96	<.01*
	Diarrhoea Incidence and Water Transport	64.08	<.001**
	Diarrhoea Incidence and Latrine Cleanliness	1.06	<.07 ^{ns}
Stomach Ache	Stomach Ache Incidence and Types of Latrine Availability at Home	5.98	<.1 ^{ns}
	Stomach Ache Incidence and Distance of Source of Water from Latrine	6.15	<.02*
	Stomach Ache Incidence and Water Transport	25.60	<.001**
	Stomach Ache Incidence and Latrine Cleanliness	0.09	<.2 ^{ns}
Skin Disease	Skin Disease and Types of Latrine Facilities at Home	0.38	<.3 ^{ns}
	Skin Disease and Latrine Cleanliness	58.42	<.001**
Eye Disease	Eye Disease and Latrine Cleanliness	0.28	<.09 ^{ns}

** = Highly Statistical Significant
* = Moderately Statistical Significant
ns = Not-Significant

5.3 CORRELATION BETWEEN HYGIENE BEHAVIOUR AND HYGIENE FACILITIES AVAILABLE AT HOME

Table 63 through Table 65 will mainly deal with the correlation, if any, between hygiene behaviour (washing of both hands, wearing of sandals in latrine, latrine practices at home) and hygiene facilities available at home (such as, source of water from latrine, types of latrine at home, cleanliness of latrine and water storage).

5.3.1 Hand Washing Practices by Distance of Source of Water from Home:

It can be observed from Table 50 that the morbidity of students (59.0%) who wash both hands have greater access to water source near their house than those students who lack this resource (2.0%). On the whole non-availability of water resource near home (requiring more than 5 minutes walk) discourages children from washing both hands (3.1%). The differences with regard to hand washing depend on the availability of water source near home to a greater extent.

Table 63: Hand Washing Practices By Distance of Source of Water from Latrine
(% Distribution)

Hand Washing Practices (Both Hands) After Defecation & Before Eating	Time Taken to Reach the Source of Water	
	Near (Less than 5 Minutes) N=333	Distant (More than 5 Minutes) N=18
Wash Both Hands N=214	207 (59.0)	7 (2.0)
Don't Wash Both Hands N=137	126 (35.9)	11 (3.1)
$X^2 = 3.9, df = 1, P = < .05$		

The relationship between hand washing practice and distance of source of water from latrine is validated by X^2 -test (.05 level of probability).

5.3.2 Sandal Wearing Practice by Types of Latrine and Cleanliness of Latrine:

Attention was given to relate sandal wearing practice with types of latrine as well as cleanliness of latrine in Table 64. It is important to find out whether children's behaviour or practices in wearing sandals vary in any way when they go to sanitary latrine or non-sanitary latrine. About 48.0% of the children when going to non-sanitary latrines (hanging, bushes, open space) never wear any sandals. Wearing of sandals in non-sanitary latrines is limited to only 8.0% of children. On the other hand, the number of children who use sandals while going to sanitary latrine is extremely negligible 1.7%. The corresponding figure for students wearing sandals (sanitary type) is 17.4%. The correlation between sandal wearing practice and types of latrine at home seems to be very strong measured in statistical test of significance ($P < .001$). It should be emphasized that latrines though may vary in kinds require cleaning at regular intervals. Uncleaned latrines, if these are non-sanitary in type, may create hostile environs for viral diseases thus posing high health risk. Our query could not find any significant relationship of sandal wearing practice with cleanliness of latrine at home. But such relationship can not be ruled out from the causality factors.

Table 64: Types of Latrine and Cleanliness of Latrine at Home By Sandal Wearing Practice in Latrine (% Distribution)

Sandal Wearing Practice While Going to Latrine	Types of Latrine at Home			Latrine Cleanliness at Home	
	Sanitary (Water-Seal) N=67	Semi-Sanitary (Pucca, Open Dug) N=90	Non-Sanitary (Hanging, Bushes, Open Space) N=194	Clean Latrine N=168	Unclean Latrine N=183
Wear Sandals While Going To Latrine N=123	61 (17.4)	34 (10.0)	28 (8.0)	52 (14.8)	71 (21.2)
Don't Wear Sandals While Going to Latrine N=228	6 (1.7)	56 (16.0)	166 (47.3)	116 (33.0)	112 (31.9)
$X^2 = 128.77, df = 2, P = < .001$				$X^2 = 2.36, df = 2, P = < .1$	

Summary of Findings

Hygiene Behaviour and Hygiene Facilities Availability at Home (Correlation Analysis)

Strength of Causal Relationship		X ² -Value	P-Value
Hand Washing Behaviour	Hand Washing Practice and Distance of Water Source for Latrine Use	3.9	<.05*
Sandal Wearing Behaviour	Sandal Wearing Practice and Types of Latrine at Home	128.77	<.001**
	Sandal Wearing Practice and Latrine Cleanliness at Home	2.36	<.1 ^{ns}
Latrine Practice Behaviour	Latrine Practice and Water Transport	166.45	<.001**

** = Highly Statistical Significant

* = Moderately Statistical Significant

ns = Not-Significant