International Journal of Multidisciplinary Research and Development
Online ISSN: 2349-4182, Print ISSN: 2349-5979, Impact Factor: RJIF 5.72
www.allsubjectjournal.com
Volume 3; Issue 12; December 2016; Page No. 199-204

Knowledge and practices regarding hygiene and sanitation among government and private school students of rural Bikaner

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Abstract
Children are the most vulnerable segment of the population to hygiene and sanitation concerned health hazards and consequently are affected the most The poor health and lack of hygiene and sanitation facilities are important underlying factors for low school enrolment, absenteeism, poor classroom performance, and early school dropouts. In the nutshell, India is lacking sanitation and hygiene in its rural schools setup which affects the performance of children negatively and increases the chances of acquiring many diseases. Therefore, the present study is planned to assess the current situation of knowledge and practices regarding hygiene and sanitation in school students of rural Bikaner. In the present study, 1280 students were selected from 32 schools, which comprised of 16 government and 16 private schools. These students were selected by the process of multistage sampling. A self-administered close ended questionnaire was prepared for the study. To find whether there exists a significant difference between knowledge and practice regarding hygiene and sanitation, we conducted test of proportions where the same set of respondents were asked for two different aspects and the result was analyzed through z-test statistic. The results indicated that the knowledge (87.5%) and practices levels (77.03%) of Government School students were found as compared to Private School students (93.6%). Knowledge level and practices level (72%) of private school students. The Z-calculated (43.8) for government school and (91.5) for private school students is higher than the Z-critical (1.96). This leads to the conclusion of rejecting the null hypothesis regarding knowledge and practices level amongst both the group of students with respect to these parameters.

Keywords: knowledge, practices, hygiene, sanitation, school students

Introduction
Children spend long hours in schools as a part of their daily routines. The school environment will therefore to a great extent determine the children's health and well–being by providing access to a healthy or an unhealthy environment. Children have an increased risk and susceptibility to many pathogens and diseases, such as diarrheal diseases, as their immune systems are still maturing. Mortality rates, especially child, are measures of a country's health status, quality of life status, and socio-economic status, and are useful for informing health programs and policies. It has been estimated that more than 2.3 billion people still live without access to sanitation facilities and are unable to practice basic hygiene such as washing their hands with soap and water. Diseases related to poor sanitation, hygiene and water unavailability causes many people to fall ill or even die. Children are the most vulnerable segment of the population to sanitation concerned health hazards and consequently are affected the most. As per WHO fact sheet, 2013 nearly 1.7 billion diarrhoea cases occurred every year and it causes 7, 60,000 deaths every year. By another report 443 school days are lost annually by these preventable gastro intestinal upsets. In addition to this, poor sanitation has led to the infestation of nearly a billion people - largely children with a variety of worm infections, with its corresponding costs in health and energy. It is obvious that lack of sanitation and hygiene is a public disaster and deserves the highest priority from government as well as society.
It is widely recognised that schools could play an important role in bringing about behavioural changes and promoting better health with the weapon of knowledge. But, water and sanitation related diseases including diarrhoea, trachoma, scabies and Guinea worm, etc. All of these have compromise children's attendance and performance at school. Access to sanitation facilities is a fundamental right that safeguards health and human dignity. Such improvements may go hand in hand with hygiene behaviour change and the transmission of disease can to be prevented which will result in to better performance, better enrolment stick and educated and healthy parents of next generation.

Rationale of the study
1. Children are the most vulnerable to environmental health hazards and are subsequently also the worst affected. But then focus of the present study is made upon school children because they are eager to learn at the early stages of life, they have important roles in household chores, they can become agent of change and they are ready for initiatives guided in the schools by the school teachers and their peer groups.
2. Schools will partly determine children's health and well-being by providing a healthy or unhealthy environment and by developing useful life skills on health and hygiene.
3. So whether the said enormously progress of the recent years made in India and consequently in Rajasthan percolates to end points which our villages are still uncertain, regarding the issues of hygiene and sanitation facilities erection, their maintenance and knowledge of children about them and actual adoption of knowledge in

practice. Western Rajasthan has traditionally been considered as orthodox area poor in women education level and most importantly this area has been water deprived since time immortal due to its geo climatic condition.

4. Therefore, the present study is planned to find out the relationship between Knowledge and Practices regarding hygiene and sanitation among Government and Private school students of rural Bikaner.

Objective of the study

To find out the relationship between knowledge and practices regarding hygiene and sanitation of school students of rural Bikaner

Methodology

The Study was conducted in Bikaner district of Rajasthan.

1. **Locale of the study:** The study was conducted in Bikaner, Rajasthan.
2. **Selection of the sample:** In present study, multistage sampling was used for selection of Bikaner four directions, then village then schools, after that classes and finally students.
3. **Selection of the respondent**: In the present study upper primary students were selected because those students have knowledge from their primary class but important is that how many students are using their knowledge in actual practices in daily life. So a total of 40 students, from of 6th, 7th and 8th class of each school (government and private) were selected for study. A total of 1280 respondents were selected for the present study.

Tools of data collection

A self-administered, close ended questionnaire was prepared. Measurement of knowledge and practices regarding food hygiene and water hygiene among selected school students of rural Bikaner district was done by formulating 5 major research tools for data collection and these were:

A. General information
B. Knowledge about hygiene and sanitation
C. Practices about hygiene and sanitation

Results and discussion

The study for this objective includes the understanding of the knowledge and practices regarding hygiene and sanitation. The results of the present study as well as relevant discussions have been presented under following sub headings.

Table 1: General characteristics of Respondents

S. No.	Characteristics	Government school	Private school	Overall
1	Types of Family			
A.	Nuclear Family	183	194	377
B.	Joint Family	457	446	903
2	Family Income			
A	Inr 1000-5000 P.M	51	16	67
B	Inr 5001-10000 P.M	262	288	550
C	INR 10001-15000 P.M	202	253	455
D	Above INR 15000 P.M	125	83	208
3	Father's Education			
A	Uneducated	46	39	85
B	Primary Education	274	262	536
C	Secondary Education	102	104	206
D	Higher Secondary	110	119	229
E	Others	108	116	224
4	Mother's Education			
A	Uneducated	179	159	338
B	Primary Education	252	253	505
C	Secondary education	71	74	145
D	Higher secondary	128	122	250
E	Others	10	32	42

The family background of the students was also assessed in order to gain insights over the type of family environment that student are getting at home. This will be related to the habits developed and practiced at home and depict that whether students are exposed to the desired environment at home or not. Table 1 displays family type, income group, fathers and mother's education background, respectively. The knowledge and practice level of the school students were collected and evaluated.

Objective

To find out the relationship between knowledge and practices regarding hygiene and sanitation of school students

The current objective of the study explores the relationship between the knowledge and practice of the same group of students. This implies that how well a student is aware of the various issues related to the hygiene and sanitation and what is the knowledge level he is having, is being compared to the practice level that exists with the students. For this objective, the two school groups are studied separately and their knowledge level and practice level are compared. First the government schools will be discussed and then private school's performance will be talked about. Z-test for proportions has been used to measure the statistically significant results. To start with the objective, the first hypothesis is tested which is related to the performance in government schools and is presented as follows:

Ho: There will be no significant difference the in knowledge and practice level of government school students regarding hygiene and sanitation.

Table 2: Overall comparison of knowledge and practice level in Government schools N=1280

Government School	Knowledge level (%)	Practices level (%)	Z-test Calculated	Significance level
Overall	87.5	77.03	43.8	S
Personal Hygiene	87.6	63.13	40.6	S
Water hygiene	89.10	53.88	55.8	S
Food hygiene	89.10	52.26	57.9	S
Disposal of Human Excreta	87.5	43.43	66.3	S
School Cleanliness	88.1	72.45	28.1	S

As observed from the Table 2, on the overall basis the Government school students have higher knowledge level (87.5%) as compared to their practice level (77.03%). The Z-critical value is 1.96, which is found to be lower than the Z-calculated value (43.8). This suggests that Null hypothesis is rejected and it can be inferred that there lies a significant difference in the practice level and the knowledge level of Government school students.

With the basic five parameters to evaluate the hygiene and sanitation, the students seems to be responding in similar manner which can be seen in statistical results as well. The z-calculated value has been found greater than the critical value in all the cases which rejects the Null Hypothesis based on all these parameters. Moreover, data shows that around 87.6% students of government school have knowledge about personal hygiene but only 63.13% of them practice it. Similarly 89.10% of them are well informed about the water related cleanliness but only 53.88% of them actually do it. If we talk about the next trait i.e. food related cleanliness, 89.10% of students understand its importance like washing fruits and vegetables before using, cleaning area of cooking, washing hands before and after meal however, 52.26% of them perform these activities. There is significant drop out from the knowledge (87.5%) about the disposal of human excreta to the practice level (43.43%). Similar fall is seen in school cleanliness trait from 88.1% to 72.45%.

So we can infer that for government school students, there is a huge difference in the knowledge level and practice level. To gather more insights about the exact factors and issues related to the hygiene and sanitation, we study the five parameters in detail for the evaluation purpose.

Table 3: Knowledge and Practice level regarding Personal Hygiene in Government schools N=640

Personal Hygiene – Government School	Knowledge level (%)	Practices level (%)
Bathing Practice	88.91	83.59
Sensory Cleaning	87.11	44.80
Teeth & Mouth Cleaning	86.02	50.63
Hand& Legs Cleaning	88.40	73.48

Table 3 shows that Government school students have clear knowledge about the bathing practice as shown by 88.91% but their numbers fall to 83.59% when it comes to practicing. Cleaning of sense organs is well understood by the students however we observe a significant gap is seen between the knowledge level (87.11%) and practice level (44.80%). Teeth and mouth cleaning activities are performed less (50.63%) as compared to their knowledge level (86.02%). Same case goes for the hands and legs cleaning activities like cleaning hands with soap before meal, washing hands after using toilet where there is gap of around 37% between the knowledge level and practice level.

Table 4: Knowledge and practices level regarding Water hygiene in Government School Students N=640

Water hygiene – Government School	Knowledge level (%)	Practices level (%)
Arrangement of Water Filter	76.02	47.11
Cleaning Utensils for Self	88.71	56.84
Place for Keeping Water	88.71	53.20
Water Related Diseases	89.41	58.44

Table 4 shows the categorization of water related cleanliness. 76.02% of students are well aware of the need of using water filter but only 47.11% of them are using it. Data shows that 88.71% government school students know about the practices like cleaning water utensils, covering them, washing hands before drinking water however only 56.84% practice these activities. 88.71% students of government schools have knowledge about place for keeping water but 53.20% practice this. A similar gap is seen in place for keeping water (approximately 45%) and water related diseases (58.44%). 89.41% Students are aware of water related diseases but only 58.44% take preventions for it.

Table 5: knowledge and practices level regarding Food hygiene in Government School Students N=640

Food hygiene- Government School	Knowledge level (%)	Practices level (%)
Hands Cleanliness	81.60	47.89
Utensils & Surrounding	73.63	58.63
Food Material Cleanliness	78.20	54.18
Food Related Diseases	67.11	48.79

Table 5 shows Knowledge about hands cleaning with soap before and after meal is well understood by the students as reflected by its value (81.60%) but its practicing percentage is only 47.89%. We observe a less significant gap in the knowledge level (73.63%) and practice level (58.63%) in the utensils and surrounding cleanliness. 78.20% of students are aware of the practices like washing fruits and vegetables before using however only 54.18% of them practice it. The gap is larger and is around 18% for the knowledge and practice level of food related disease spread. 67.11 % of government school students have knowledge about food related diseases but only 48.79% practice activities that prevent such diseases.

Table 6: knowledge and practices level regarding human sanitation in Government School Students N=640

Human Sanitation – Government School	Knowledge level (%)	Practices level (%)
Facilities of Toilets	89.41	40.59
Cleanliness inside Toilets	85.82	42.50
Cleanliness Outside Toilets	87.73	40.31
Self-Cleanliness	83.52	50.31

Data shows that the importance of maintaining cleanliness inside and outside are well understood by students as their values depict (85.82% and87.73% respectively) but those who maintain it by throwing garbage in bins, flushing it properly are less (42.50% and 40.31% respectively). Next factor is self-cleanliness where similar scenario is observed i.e. a dropout rate from knowledge level of 83.52% to practice level of 50.31%.

Table 7: knowledge and practices level regarding school sanitation in Government School Students N=640

School sanitation – Government School	Knowledge level (%)	Practices level (%)
Cleaning School	87.70	73.28
Cleaning Classes	83.91	68.79
Cleaning Drains	88.40	70.20
Services Provided by Community	81.29	77.50

As shown in Table 7, In terms of cleaning schools, 87.70% of students are well equipped with knowledge but the practicing percentage is less than it which is around 74%. Theoretical knowledge of cleanliness inside classes (83.91%) and drainage system (88.40%) is more than its practical usage (68.79% and 70.20% respectively). Student's knowledge of services provided by the community is 81.29% and practical usage is 77.50%.

The next part of this objective is to Private School behavior. The second hypothesis for this objective is tested which is related to the performance in private schools and is presented as follows:

Ho: There will be no significant difference in knowledge and practice level of private school students regarding hygiene and sanitation.

Table 8: Overall comparison of knowledge and practice level in Private schools N=1280

Private School	Knowledge level (%)	Practices level (%)	Z-test Calculated	Significance level
Overall	93.6	72	91.5	S
Personal Hygiene	92.6	75.53	33.3	S
Water hygiene	91.4	71.25	36.9	S
Food hygiene	94.6	71.43	44.1	S
Disposal of Human Excreta	89.79	64.2	43.5	S
School Cleanliness	93.5	80.5	27.653	S

Table 8 shows the overall difference in the levels of knowledge and practices in the private school students. On the overall basis almost 93.6% students have the knowledge about hygiene and sanitation but only 72% are practicing them. The z-calculated (91.5) is much larger than the z-critical value (1.96). This rejects the Null Hypothesis which infers that there exists a significant difference in the overall knowledge and practice level of private school students.

Similarly for other parameters, the z-calculated was found to be very high than the critical value and thus we can reject the Null Hypothesis based on these parameter values and say that individually the knowledge and practice level differs based on these parameters. The present data shows that around 92.6% students of private school have knowledge about personal hygiene but only 75.53% of them practice it. Similarly 91.4% of them are well informed about the water related cleanliness but only 71.25% of them actually do it. If we consider food related cleanliness, 94.6% of students understand its importance like washing fruits and vegetables before using, cleaning area of cooking, washing hands before and after meal however, 71.43% of them perform these activities. There is considerable drop out from the knowledge (89.79%) about the disposal of human excreta to the practice level (64.2%). Similar gap is seen in school cleanliness knowledge and practice level from 93.5% to 80.5% respectively. The detailed analysis for these five factors is given the following tables.

Table 9: Knowledge and Practice level regarding Personal Hygiene in Private Schools N=640

Personal Hygiene - Private School	Knowledge level (%)	Practices level (%)
Bathing Practice	94.30	88.20
Sensory Cleaning	92.11	69.02
Teeth & Mouth Cleaning	90.59	61.21
Hand& Legs Cleaning	93.32	83.71

Table 9 shows that Private school students have clear knowledge about the bathing practice as shown by 94.30% and their numbers slightly differs to 88.20% when it comes to practicing. Cleaning of sense organs is well understood by the students however we observe a significant gap is seen between the knowledge level (92.11%) and practice level (69.02%). Teeth and mouth cleaning activities are performed less (90.59%) as compared to their knowledge level (61.21%). Same case goes for the hands and legs cleaning activities like cleaning hands with soap before meal, washing hands after using toilet where there is gap of around 10% between the knowledge level and practice level.

Table 10: Knowledge and Practice level regarding Water hygiene in Private Schools N=640

Water hygiene - Private School	Knowledge level (%)	Practices level (%)
Arrangement of Water Filter	91.41	67.50
Cleaning Water Utensils	94.30	78.91
Water Storage	94.80	70.70
Water Caused Diseases	94.41	67.93

In Table 10, the categorization of water related cleanliness is shown. 91.41% of students are well aware of the need of using water filter but only 67.50% of them are having it. Data shows that 94.30% private school students know about the practices like cleaning water utensils, covering them, washing hands before drinking water however only 78% practice these activities. A gap of approximately 24% is seen in knowledge and practice of place for keeping water and water related diseases (26%).

Table 11: Knowledge and Practice level regarding Food hygiene in Private Schools N=640

Food related cleanliness - Private School	Knowledge level (%)	Practices level (%)
Hands Cleanliness	90.00	73.52
Utensils & Surrounding	86.99	71.09
Food Material Cleanliness	88.01	72.50
Food Related Diseases	80.70	68.63

Table 11 shows that Knowledge about hands cleaning with soap before and after meal is well understood by the students as reflected by its value (90%) but its practicing percentage is only 73.52%. We observe a less significant gap in the knowledge level (86.99%) and practice level (71.09%) in the utensils and surrounding cleanliness. 88% students are aware of the practices like washing fruits and vegetables before using however 27.5% don't follow it. The knowledge of students of private schools about food related diseases is 80.70% but practice level is 68.63%.

Table 12: Knowledge and Practice level regarding Human sanitation in Private Schools N=640

Human Sanitation - Private School	Knowledge level (%)	Practices level (%)
Facilities of Toilets	90.94	67.11
Cleanliness inside Toilets	88.20	58.48
Cleanliness Outside Toilets	90.31	62.38
Self-Cleanliness	93.32	68.79

Data shows us that 67% of students follow the personal and human sanitation activities while those who are aware of it accounts to 91%. The importance of maintaining cleanliness inside and outside are well understood by students as their values depict (88.2% and 90.31% respectively) but those who maintain it by throwing garbage in bins, flushing it properly are very less (58.48% and 62.38% respectively). For self-cleanliness, similar scenario is observed i.e. a dropout from knowledge level (93.32%) to practice level (68.79%).

Table 13: Knowledge and Practice level regarding School Cleanliness in Private Schools N=640

School Cleanliness - Private School	Knowledge level (%)	Practices level (%)
Cleaning School	93.01	80.63
Cleaning Classes	92.73	78.71
Cleaning Drains	93.83	80.20
Services Provided by Community	94.41	82.50

In terms of cleaning schools, 93.01% of students are well equipped with knowledge but the practicing percentage is less than 80.63%. Theoretical knowledge of cleanliness inside classes (92.73%) and drainage system (93.83%) is more than its practical application (78.71% and 80.20% respectively). At community level, we observed a difference of around 6%.Now as compared to the government schools, the private school students perform better in their knowledge and practice levels with respect to hygiene and sanitation. But both the groups have shown considerable amount of difference between the knowledge and practice level with government schools performing significantly lower on the practice level.

Comparing the Knowledge and Practice level in various school students with respect to Hygiene and Sanitation, there were many studies conducted in various parts of the world. Study by Deb et.al. (2010) [2] in South Kolkata also revealed higher hygienic practices amongst the students which was almost more than 70% in most of the cases. Jasper *et al* (2012) [3] also emphasized that lack of sanitation facilities in schools leads to occurrence of diarrheal and gastrointestinal diseases. Study by Reena Chudgar (2010) [1] regarding Knowledge and Practices in Ghana. Instead of two school groups, the hygiene was compared in two regions irrespective of age and education. Hygiene was the focus of the study which concentrated on Human Sanitation and its disposal in both the areas. There were significant differences found. Particularly school hygiene and sanitation was studied by Fatuma Nansereko (2010) [4] in the Mpigi district for secondary schools. The study also focused on the hygiene level in the schools. But the study was not positively inclined towards the better arrangements of the sanitation and hygiene in the schools. Not more than 50% of the students responded positively in this regard. The facilities were also not good. But as per the present study, we can see a very high rate of knowledge and practice level amongst the school students.

Given the existing studies and current study, it can be concluded that Private School students are better in terms of Knowledge and Practices for Hygiene and Sanitation as compared to Government School students. But overall, it can be said that the students of Bikaner region are following the hygiene and sanitation practices in much better manner.

Conclusions

This study has shown a need to improve practices regarding hygiene and sanitation because the government and private school students have good knowledge about hygiene and sanitation but they have not good practices due to lack of resources. Such as the water problem in rural area and water source or sanitation service, use of these services, water storage and treatment practices, availability of soap and toothpastes. A change in awareness or knowledge can lead, through the complex system, to the changes in behavior ultimately.

Recommendations

- The strength of the government schools is way too much then the private schools but the awareness campaigns run by them are not up to the mark accordingly. They need to be more rigorous and widespread.
- The huge strength of students also calls for a greater number of facilities. Facilities related to water and sanitation needs to be more appropriate considering the greater number. Toilets and sanitation need to be more frequently cleaned. Also, more number of facilities should be made available so as to fulfill the needs of everyone.
- Taboos exist in the uneducated classes regarding the usage of public toilets and the usage of same toilet by girls and boys. To deal with the former authorities can ensure better public toilet conditions and can run awareness campaigns to help break the taboos.
- Both the genders should be prominently and equally addressed regarding the issues of hygiene and sanitation. Addressing just one of them would be an incomplete mission.
- All the students despite their backgrounds of family income and type should be addressed with care and caution. The students from lower background might need more attention and convincing.
- Hygiene and sanitation would no doubt lead to positive health impacts. Therefore improvement in them would help in achieving better health standards for the country.
- Although just knowledge about the practices or even following them is not enough until the proper facilities are also provided. Health impacts can be achieved only if the practices are properly taught about and adopted.

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