

“A Study to Assess the Effect of Health Teaching on Knowledge Regarding Health Hazard of Soft Beverages among High School Students in Selected Schools.”

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Abstract:

Background: Consumption of two or more soda drinks daily was related to an increased risk of chronic kidney diseases due to high levels of orthophosphoric acid within the body.

Objectives: To assess the effectiveness of a structured teaching programme on knowledge regarding the harmful effects of soft drink consumption among high school students in selected schools

Method: In this study quantitative approach is used. Simple Random sampling technique was used to select the samples. One group pre-test post-test pre-experimental design was adapted to this study. The setting of the study was selected high school Pune city. The samples were all high school children of selected school Pune city. Sample Size was 100 high school children. Non-Probability Convenient Sampling Technique was used. Population of the study were Age group of 13-16. Independent variable was Health teaching regarding health hazards of soft beverages among high school students. Dependent variable was Knowledge regarding health hazards of soft beverages among high school students. The tool of the study divided into two sections. Section A: It consists of semi-structured questionnaire to collect demographic data, Section B: Self-Structured Knowledge Questionnaires

Result: In the pre-test 12 % of the Students had poor level of knowledge score, 77 % had average level of knowledge score. In post-test 10 % of the Students had good level of knowledge score and 90 % had excellent level of knowledge score. The difference between pre-test and post-test level of knowledge score was found to be statistically significant (χ^2 -value= 30.93).

Conclusion: The study concludes that the knowledge score of the Students shows marked improvement after giving Structured Teaching Program. This indicates that Structured Teaching Program was effective in improving the knowledge of the Students regarding health hazards of soft drinks.

Keywords: Assess Effect, Health Teaching, Health Hazard of Soft Beverages, High School Students.

Introduction:

Food is at the heart of our every person's well-being and is central to maintain good health. We have to take good care of body because it is a vehicle to transport us from one place to another and enable us to do the things

that we dream of doing. Food, health and education on are the three most important ingredients of person's lives. The leading trend in functional food ingredients can impact persons health and life style.¹

Nowadays, the consumption of soft drink is much favored by every generation. No sector is left affected by its influence. People are consuming soft drinks almost every day without even knowing the ill-effects and the harm of soft drinks on their dental and general health.¹

Soft drinks are a non-alcoholic beverage, mostly carbonated, contains natural or artificial sweetening agent, edible acids, natural or artificial flavors, and sometimes juice. Pepsi, Coca cola, Miranda, and Seven Up are the examples of the soft drinks. The term soft drink was originated to differentiate the flavored drinks from hard liquor, or distilled spirits. Joseph Priestly was the first person who created carbonated water in 1767. Since then, many researchers began working on carbonated water and in 1835 the first bottled liquid soda was manufactured in United States.²

Soft drinks usually composed of carbonated water, sugar syrup, caramel color, caffeine, citric acid, natural or artificial flavors, carbon dioxide, organic diol, and Brominated oil, in addition to several other ingredients. Soft drinks are high in calories with no other type of nutrients. The average can of soft drink and fruit drink provides around 150 calories, majority from the added sugar. If person consume soft drink every day without reducing other calories, person can gain weight up to 5 pounds in one year and these sugary drinks can increase the risk of type-II diabetes, heart diseases, and other chronic diseases.³

Consumption of two or more soda drinks daily was related to an increased risk of chronic kidney diseases due to high levels of orthophosphoric acid within the body. Some study did over 3,000 women which concluded that consuming two servings or more of artificially sweetened soft drinks each day was significantly connected to more rapid renal function decline in older women and doubled the danger of kidney function decline. There is a robust relationship between a high risk of developing gout and drinking sweetened soda and fructose in daily.²

There is a high risk of cavity as many soft drinks contain high levels of sucrose, carbohydrates, and fructose sugars. Over consumption of sugary drinks will cause dental problems due to sugar components present in soft drinks. Also, phosphoric and citric acid present in soft drinks weakened the enamel with long exposure time, removing the protective layer which is cause enamel and exposing the soft dentin. These circumstances cause cavity and hypersensitivity.⁴

The Indian culture has accepted the habit of drinking carbonated soft drinks. As carbonated beverages gained popularity, many people especially teenagers are used to the consumption on of large amount of soft drinks all through the day which can neglecting their normal food habits. A study was conducted with aimed to assess the knowledge, attitude and practice (KAP) on carbonated soft drinks and their effect on health among teenagers. In this study 100 students in the age group of 13–19 years were included. A structured questionnaire was used to measure knowledge, 3-point Likert's scale was used to attitude and a check list was used to assess the practice carbonated Soft Drinks. Result of the study showed that the teenagers, 13.8% had adequate knowledge, 23.55% had favorable attitude towards carbonated soft drinks and their effect on health. The favorable practice was shown by 28% of teenagers. The study concluded that the health education on and primordial prevention on would be the best way to create awareness and to adopt healthy life style and combat the problems associated with carbonated so drink consumption on among teenagers.⁵

Every parent should consider their children as blessings from the lord and these blessings also comes with lots of responsibilities. Parents are responsible for the helping children grow physically, intellectually, emotionally and spiritually strong. In today's scenario, discipline is one of the biggest problems that every parent face, especially in a school going child.⁶ School age children consume carbonated drinks in breathtaking quantities and are often unaware of the health hazards of the excess consumption of carbonated drinks. The term "drink", while nominally neutral, often carries connotations of alcoholic content, and the name "soft drink" a lack of alcohol by way of contrast to the term "hard drink", like colas, sparkling water, iced tea, lemonade, squash, and fruit punch are among the most common types of soft drinks.⁶

Annually, approximately 3.4 million adults die each year from obesity associated diseases such as, diabetes, heart disease, and cancer. Many other diseases are affiliated with these some chemicals, included but were not limited to high blood pressure, gout, kidney function decline, cirrhosis, depression and anxiety, and osteoporosis. These conditions affect the body, which in turn affected the oral cavity by causing manifestations such as xerostomia, ulcers, ulcerative gingivitis, bone loss, tooth loss and periodontal disease.⁶

Another study data was collected from 192,000 male and female of age group 22-26 participating in three long-term studies found that increasing total sugary beverage intake, including both sugar sweetened beverages and 100% fruit crush, by quite 4 ounces per day over a four-year period was related to a 18% higher risk of type 2 diabetes. The study also found that drinking more artificially sweetened beverages instead of sugary beverages didn't appear to reduce diabetes risk. However, replacing daily serving of a sugary beverage with water, coffee, or tea was linked with a 2–10% lower risk of diabetes.⁷

Background Of Study:

Bhagyashree S. Meshram (2023) conducted study on Young children copy parents' sugary drinks habits with aimed to assess the effectiveness of structured teaching program on knowledge regarding harmful effects of soft drink consumption among high schools children in selected schools. A Quasi experimental study with one group pre-test post-test design was carried out in selected high schools children. 70 samples were selected by non-probability convenient sampling technique. Tool was consisting of Section A: It consists of semi-structured questionnaire to collect demographic data. Section B: Self-Structured Knowledge Questionnaires. Result of the study showed that the comparison of pretest and post-test knowledge scores of high school children regarding harmful effects of soft drink consumption from selected high school. Mean was 10.24, standard deviation was 1.22 and mean difference values are compared and student's paired 't' test is applied at 5% level of significance. The tabulated value for $n=70-1$ that is 69 degrees of freedom was 1.98. The calculated 't' value i.e. 70.18 are much higher than the tabulated value at 5% level of significance for overall knowledge score of high school children which is statistically acceptable level of significance. The study concluded the knowledge of high school children on harmful effects of soft drink consumption is inadequate. The use of structured teaching program is effective in improving knowledge of high school children on harmful effects of soft drink consumption.⁸

Diksha Kumari (2022) conducted study on Effectiveness of Planned Teaching Program on Knowledge Regarding Health Hazards of Sweetened Beverages and Fast Food Consumption Among Adolescents in Selected Schools of Kullu, Himachal Pradesh with aimed to assess the effectiveness of planned teaching program on knowledge regarding health hazards of sweetened beverages and fast food consumption among adolescents in elected schools of Kullu, Himachal Pradesh. A pre-experimental study was conducted in 2021 in selected schools of Kullu, Himachal Pradesh sample of 60 adolescents students were selected using non-probability purposive sampling technique. Pre-test was conducted and on same day planned teaching program was administered. After relapse of seven days, post test was conducted using self-structured questionnaire. The result of the study showed that the mean pretest knowledge score was 9.73 ± 4.843 and posttest mean knowledge score was 25.77 ± 2.801 with mean difference of 16.04 .paired "t" test was applied and the value of "t" was 35.652, P is <0.001 which was found to be significant and effectiveness seen in knowledge level of 85.90%, which interpreted that majority of adolescents students has gained knowledge to good knowledge regarding health hazards of sweetened beverages and fast food consumption.⁹

Problem Statement:

"A study to assess the effectiveness of a structured teaching programme on knowledge regarding the harmful effects of soft drink consumption among high school students in selected schools.

Objective of The Study:

1. To identify the level of knowledge regarding health hazards of soft drinks among Students in selected school.

2. To evaluate the effect of Structured Teaching Program on knowledge regarding health hazards of soft drinks among Students in selected school.
3. To find association between the pre-test knowledge score with selected demographic variable.

Assumption Of The Study:

Students may have some prior knowledge.

- It is assumed that high school students already possess some level of knowledge about soft drinks and their health effects.
- A teaching program can improve knowledge.
- It is assumed that a structured teaching program will help to increase the knowledge of students regarding health hazards of soft drinks.
- Students will cooperate during data collection.
- It is assumed that students will actively participate and give correct responses during the study.
- Knowledge can influence lifestyle habits.
- It is assumed that improved knowledge may help students make healthier choices and reduce consumption of soft drinks.
- A school setting is suitable for education.
- It is assumed that the school environment is appropriate for conducting health education programs Effectively.

Hypothesis:

H0: There is no significant difference in knowledge before and after the structured teaching program.

H1: There is a significant increase in knowledge after the structured teaching program.

Limitation & Delimitation:

Limitations

- The study is conducted only among high school students from selected schools, so results cannot be generalized widely.
- The structured teaching program is assessed over a short period; long-term retention of knowledge is not evaluated.
- Time constraints during data collection may limit detailed interaction with students.
- The study focuses only on knowledge regarding harmful effects of soft drink consumption and does not assess actual behavioral changes.
- Only students who are available and willing to participate are included in the study.

Delimitations

- The study is limited to high school students only.
- The study is confined to selected schools.
- The study assesses only knowledge regarding harmful effects of soft drink consumption.
- The duration of the study is restricted to a specific data collection period.

Ethical Aspects Of The Study:

- Ethical approval was obtained from the concerned Institutional Ethical Committee prior to the conduct of the study.
- Permission was obtained from the school authorities to conduct the study in selected schools.
- Informed consent was obtained from the participants (and assent/permission from parents or guardians, wherever required).
- The purpose of the study was clearly explained to the participants before data collection.

- Participants were assured that participation was voluntary, and they had the right to withdraw from the study at any time without any penalty.
- Confidentiality and anonymity of the participants were maintained throughout the study.
- The study did not involve any physical, psychological, or social harm to the participants

Research Methodology:

Research Approach: In this study quantitative approach is used.

Sampling Technique: Simple Random sampling technique.

Research Design: One group pre-test post-test pre-experimental design.

Setting: Selected high school Pune city.

Sample- All high school children of selected school Pune city.

Sample Size -100 high school children.

Sampling Technique - Non-Probability Convenient Sampling Technique Tool

Population: Age group of 13-16.

Variables of the Study:

Independent variable –Health teaching regarding health hazards of soft beverages among high school students.

Dependent variable –Knowledge regarding health hazards of soft beverages among high school students.

Tools And Techniques Of Data Collection:

Section A: It consists of semi-structured questionnaire to collect demographic data.

Section B: Self-Structured Knowledge Questionnaires

Sampling Criteria:

Inclusion Criteria:

- Students who are 14 - 17 years old studying in the selected high school.
- Students who are present on the day of data collection.

Exclusion Criteria:

- Students who are absent during the time of data collection or teaching program.
- Students who decline participation or withdraw consent during the study.

Result:

Section I: Distribution Of Students With Regards To Demographic Characteristics

Table 1: Percentage wise distribution of Students according with regards to demographic characteristics
n=100

Age(years)	No. of Students	Percentage (%)
13 years	10	10.00
14 years	39	39.00
15 years	26	26.00
16 years	25	25.00
Gender	No. of Students	Percentage (%)
Male	62	62.00

Female	37	37.00
Other	01	01.00
Class / Grade	No. of Students	Percentage (%)
8 th standard	45	45.00
9 th standard	49	49.00
10 th standard	06	06.00
Type of Family	No. of Students	Percentage (%)
Nuclear family	58	58.00
Joint family	41	41.00
Extended family	01	01.00
Father's Education	No. of Students	Percentage (%)
No formal education	19	19.00
Primary education	42	42.00
Secondary education	30	30.00
College/University degree	09	09.00
Mother's Education	No. of Students	Percentage (%)
No formal education	24	24.00
Primary education	58	58.00
Secondary education	15	15.00
College/University degree	03	03.00
Father's Occupation	No. of Students	Percentage (%)
Unemployed	19	19.00
Self-employed	38	38.00
Private job	39	39.00
Government job	04	04.00
Other	00	00
Mother's Occupation	No. of Students	Percentage (%)
Housewife	47	47.00
Self-employed	40	40.00
Private job	11	11.00
Government job	02	02.00
Other	00	00
Monthly Family Income	No. of students	Percentage (%)
Below ₹10,000	26	26.00

₹10,001 – ₹20,000	32	32.00
₹20,001 – ₹30,000	33	33.00
Above ₹30,000	09	09.00
Consume Soft Drinks	No. of students	Percentage (%)
Yes	99	99.00
No	01	01.00

The above table 1 shows that the distribution of Students according to their age shows that 39 % of the Students were 14 years of age, 62 % of Students were male and 37 % of Students were female, 49 % of the Students were in 9th standard and 6 % of the Students were in 10th standard, 58 % of the Students were living in nuclear family, 42 % of the Students father were having primary education. 30 % of the Students fathers were having secondary education and 9 % of the Students fathers were having College/University degree.

Distribution of Students according to their mother education shows that the 24 % of the Students mother were not having formal education. 58 % of the Students mothers were having primary education. 15 % of the Students mothers were having secondary education and 3 % of the Students mothers were having College/University degree.

Distribution of Students according to their father occupation shows that the 19 % of the Students father were unemployed. 38 % of the Students fathers were Self-employed. 39 % of the Students father were having Private job and 4 % of the Students father were having Government job.

Distribution of Students according to their mothers occupation shows that the 47 % of the Students mothers were Housewife. 40 % of the Students mothers were Self-employed. 11 % of the Students mothers were having Private Job and 2 % of the Students mothers were having Government job.

Distribution of students according to their monthly family income shows that the 26 % of the students were having below ₹10,000 monthly family income. 32 % of the students were having ₹10,001 – ₹20,000 monthly family income. 33 % of the students were having ₹20,001 – ₹30,000 monthly family income and 9 % of the students were having above ₹30,000 monthly family income.

Distribution of students according to Consume Soft Drinks shows that the 99 % of the students were consumes soft drinks.

Section II: Assessment Of Knowledge Score Of Health Hazards Of Soft Drinks Among Students.

Table 2: Assessment of Knowledge score of Students regarding health hazards of soft drinks before giving Structured Teaching Program. n=100

Domain	Maximum score	Mean	Standard deviation	Mean percentage
Knowledge score	12	6.48	1.84	43.20

The above table 2 shows the in pretest mean knowledge score regarding health hazards of soft drinks among Students was 6.48. It indicates that, Students were having average knowledge in pretest.

Table 3: Assessment of Knowledge score of Students regarding health hazards of soft drinks after giving Structured Teaching Program. n =100

Domain	Maximum score	Mean	Standard deviation	Mean percentage
Knowledge score	15	13.54	0.93	90.27

The above table 3 shows the in posttest mean knowledge score regarding health hazards of soft drinks among Students was 13.54. It indicates that, Students were having excellent knowledge in posttest.

SECTION III: Evaluate The Effectiveness Of Structured Teaching Program On Health Hazards Of Soft Drinks.

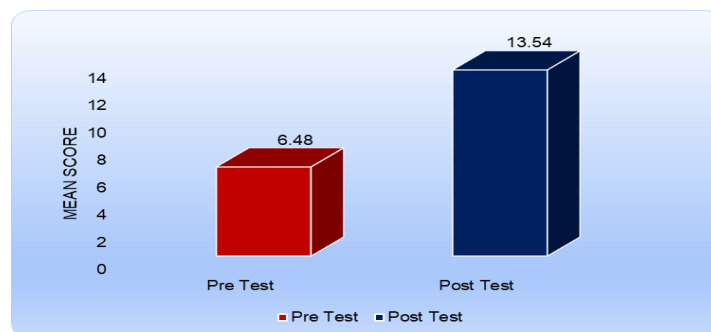


Figure 1: Significance of knowledge score regarding health hazards of soft drinks of Students before and after Structured Teaching Program.

The above figure 1 shows that in the pretest the mean of the knowledge score obtained by the Students was 6.48 and in the post test it rise to 13.54. The knowledge score of the Students shows marked improvement after giving Structured Teaching Program. From the above table, it is evident that the calculated 't' value was greater than the table value of 't' at 0.05 level. This indicates that Structured Teaching Program was effective in improving the knowledge of the Students regarding health hazards of soft drinks.

Section IV: Level Of Knowledge Score Of Students In Pre And Post Test

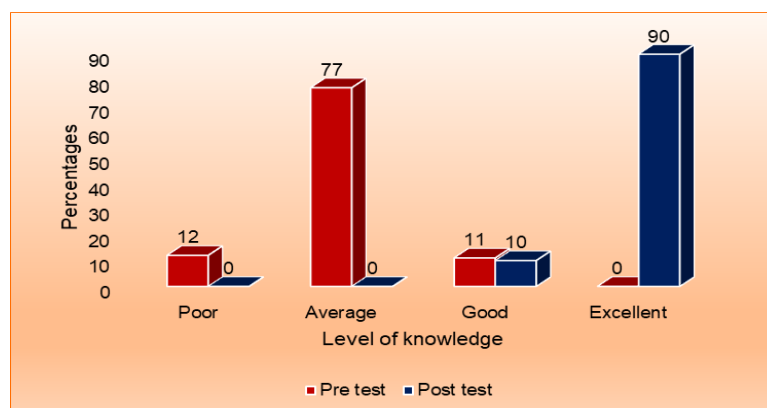


Figure 14: Distribution of Students with regards to general assessment

The above figure 2 shows that, in pretest 12 % of the Students had poor level of knowledge score, 77 % had average level of knowledge score. In posttest 10 % of the Students had good level of knowledge score and 90 %

had excellent level of knowledge score. The difference between pretest and posttest level of knowledge score was found to be statistically significant (χ^2 -value= 30.93).

SECTION- V: Association Of Knowledge Score Of Students In Relation To Demographic Variables

Table 4: Significance of difference of Pretest knowledge on health hazards of soft drinks in relation to demographic variables n=100

Age (yrs)	No. of Students	Pretest knowledge	F-value	p-value
13 years	10	7.80 $\pm$ 2.85	3.43	0.02 S, p<0.05
14 years	39	6.54 $\pm$ 1.86		
15 years	26	5.73 $\pm$ 1.51		
16 years	25	6.60 $\pm$ 1.32		
Gender	No. of Students	Pretest knowledge	t-value	p-value
Male	62	6.35 $\pm$ 1.56	0.44	0.64 NS, p>0.05
Female	37	6.70 $\pm$ 2.25		
Other	01	6.00		
Class / Grade	No. of Students	Pre test knowledge	F-value	p-value
8th standard	45	00	3.89	0.02 S, p<0.05
9th standard	49	6.59 $\pm$ 1.84		
10th standard	06	4.50 $\pm$ 1.04		
Type of Family	No. of Students	Pre test knowledge	f-value	p-value
Nuclear family	58	6.93 $\pm$ 1.92	5.02	0.008 S, p<0.05
Joint family	41	5.90 $\pm$ 1.52		
Extended family	01	4.00 $\pm$ 00		
Father's Education	No. of Students	Pre test knowledge	F-value	p-value
No formal education	19	6.94 $\pm$ 1.22	5.31	0.002 S, p<0.05
Primary education	42	7.07 $\pm$ 1.96		
Secondary education	30	5.60 $\pm$ 1.56		
College/University degree	09	5.66 $\pm$ 2.00		
Father's Occupation	No. of Students	Pretest knowledge	F-value	p-value
Unemployed	19	7.05 $\pm$ 0.97	5.44	0.002 S, p<0.05
Self-employed	38	7.10 $\pm$ 2.11		
Private job	39	5.66 $\pm$ 1.65		
Government job	04	5.75 $\pm$ 0.50		

Other	00	00		
Mother's Occupation	No. of Students	Pretest knowledge	F-value	p-value
Housewife	47	6.87 ± 1.94	1.71	0.16 NS, $p > 0.05$
Self-employed	40	6.20 ± 1.88		
Private job	11	5.72 ± 0.78		
Government job	02	7.00 ± 1.41		
Other	00	00		
Monthly Family Income	No. of Students	Pretest knowledge	F-value	p-value
Below ₹10,000	26	7.53 ± 2.24	7.64	0.00 S, $p < 0.05$
₹10,001 – ₹20,000	32	6.40 ± 1.21		
₹20,001 – ₹30,000	33	5.51 ± 1.48		
Above ₹30,000	09	7.22 ± 1.92		
Consume Soft Drinks	No. of Students	Pretest knowledge	t-value	p-value
Yes	99	6.48 ± 1.85	0.06	0.79 NS, $p > 0.05$
No	01	6.00 ± 00		

In the above mentioned table 4 by applying one way ANOVA to associate knowledge with age, in which F-value was 3.43 and p-value= 0.02, which is less than 0.05, hence significant.

There is no significant difference was found in the gender of Students. As t value was 0.44 and p-value was 0.64 is more than 0.05, hence it was not significant.

By applying one way ANOVA to associate knowledge with class/grade, in which F-value was 3.89 and p-value= 0.02, which is less than 0.05, hence significant difference was found in various class of Students.

Type of Family, in which F-value was 5.02 and p-value= 0.008, which is less than 0.05, hence significant difference was found in Type of Family of Students.

By applying one way ANOVA to associate knowledge with Father's Education, in which F-value was 5.31 and p-value= 0.002, which is less than 0.05, hence significant difference was found in Father's Education of Students.

By applying one way ANOVA to associate knowledge with mothers Education, in which F-value was 5.00 and p-value= 0.003, which is less than 0.05, hence significant difference was found in mothers Education of Students.

By applying one way ANOVA to associate knowledge with Father's occupation, in which F-value was 5.44 and p-value= 0.002, which is less than 0.05, hence significant difference was found in Father's occupation of Students.

By applying one way ANOVA to associate knowledge with mothers occupation, in which F-value was 1.71 and p-value= 0.16, which is more than 0.05, hence no significant difference was found in mothers occupation of Students.

By applying one way ANOVA to associate knowledge with Monthly Family Income, in which F-value was 7.64 and p-value= 0.00, which is less than 0.05, hence significant difference was found in Monthly Family Income of Students.

By applying unpaired t test to associate knowledge with Consume Soft Drinks, in which t-value was 0.06 and p-value= 0.79, which is more than 0.05, hence no significant difference was found in Consume Soft Drinks of Students.

Discussion

Usha Rani Kandula (2021) conducted a study on Knowledge regarding health hazards of soft drinks among nursing college students with aimed with to assess the knowledge of health hazards on soft drinks among nursing students, to find out the association between level of knowledge on health hazards of soft drinks and with demographic variables among nursing students. A quantitative research approach with descriptive research design was adopted to assess the knowledge on health hazards of soft drinks among nursing college students. The setting of the study was at Chaitanya College of nursing, Ongole, and Andhra Pradesh, India. Total 100 students were drawn by Purposive sampling technique. Structured questionnaire was prepared on health hazards of soft drinks and administer to each sample individually. The result of the study showed that the majority 60(60%) had inadequate knowledge, 29(29%) students had moderately adequate knowledge and 11(11%) students had adequate knowledge on health hazards of soft drinks with Mean 11.81 and Stranded deviation 4.75. The study concluded that, among 100 samples majority of the students had inadequate knowledge regarding health hazards of soft drinks. The study strongly recommends that the, there should be a need to bring awareness among nursing college students on health hazards of soft drinks in order to prevent health complications among the nursing students.¹⁰

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Conflict Of Interest

The authors declare no conflict of interest.

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Recommendations:

1. Formal education program should be conducted in all primary health centers, sub centers, anganwadi, etc. regarding knowledge regarding health hazard of soft beverages.
2. The study can be replicated on large subjects; and on various settings, so that findings can be generalized to a large population.
3. Such studies can be carried out using other teaching strategies like planned teaching, computer-assisted instruction on knowledge regarding health hazard of soft beverages
4. An experimental study can be carried on effectiveness of structured teaching program on knowledge regarding knowledge regarding health hazard of soft beverages.

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