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Original Article:

Study to Assess the Prevalence of Soft Drinking and its Determinants among the School going Children of Gwalior city

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Abstract:
Background: Over the time there has been spectrum of changes in the universe. It may be at physical, chemical and cultural level. People have adopted newer life styles like their working style, clothing's, food habits and so on. One of the pertinent example of this newer food habits is rising consumption of soft drinks rather than traditional home made drinks. This study was aimed to find out various determinants responsible for this rising trend of soft drinking so that effective intervention can be undertaken to overcome this creeping problem. **Objectives:** To find out the prevalence of soft drinking consumption among the students and to assess the determinants of soft drink consumption among the students. **Materials and methods:** It was a cross sectional study. A sample of 200 students was selected from the both govt. and private schools by stratified random sampling. Then they all were interviewed by using pre tested, semi structured proforma. Later on data was analyzed manually and by using suitable statistical software. **Results:** Frequent drinking of soft drinks was found more among the students of private schools than govt. ($p < 0.05$). A significant association was found between pocket money, TV watching and frequency of soft drinking ($p< 0.05$).Other reasons which were found to be responsible by far for frequent soft drinking like lack of awareness regarding hazards, frequent TV watching, desire of new taste, lack of health education from the parents side etc. **Conclusion:** Soft drinking consumption is creeping day by day amongst the children with out knowing their hazards. And they are the future of any country so there should be effective intervention from both sides govt. as well as parents to get rid of it at earliest.

Key Words: Soft Drinking, School students, Prevalence, Determinants

Introduction:

Over the time there has been spectrum of changes in the universe. It may be at physical, chemical and cultural level. People have adopted newer life styles like their working style, clothings, food habits and so on. One of the pertinent example of this newer food habits is rising consumption of soft drinks rather than traditional home made drinks.

Youngsters consume carbonated drinks in breathtaking quantities and are often unaware of the health hazards of the excess consumption. Carbonation occurs when carbon dioxide is dissolved in water or an aqueous solution.[1,2] A soft drink is a beverage, often carbonated, that does not contain alcohol. The name "soft drink" specifies a lack of alcohol by way of contrast to the term "hard drink" Beverages like colas, sparkling water, iced tea, lemonade, squash, and fruit punch are among the most common types of soft drinks, while hot chocolate, hot tea, coffee, milk, tap water, and milkshakes do not fall into this classification. Research suggests kids who drink a lot of soft drinks risk becoming fat, weak-boned, cavity-prone and caffeine addicted. Scientific studies have shown how as few as one or two soft drinks a day can increase one's risk for numerous health problems. Some of these health problems are obesity, diabetes, tooth decay, osteoporosis, nutritional deficiencies, heart disease, and many neurological disorders.[3]Many sodas are high in calories and have a lot of sugar - not good for waistline or teeth. When one consumes carbonated beverages instead of milk, juice and water, body will not get some of the nourishment as per the needs.[4]

Ever since they came in to light newer crop of our society i.e. children became most vulnerable for the hazards soft drinking. This may perhaps because of they are unaware about the rationale use of soft drinks and its harmful effects. And this some time may lead to irrational use of soft drinks responsible for lots of health hazards among the children. This trend is gradually rising day by day. Several factors may be associated with soft drink intake in school-aged children, most notably taste preferences, soft drink consumption habits of parents and friends, soft drink availability in the home and school, and television viewing. Additional research is needed to verify these findings in a representative sample of children.[5] This study was aimed to find out various determinants responsible for this rising trend of soft drinking so that effective intervention can be undertaken to overcome this creeping problem.

This study was conducted with the objectives to find out the prevalence of soft drinking consumption among the students and to assess the determinants of soft drink consumption among the students.

Materials and Methods:

Study type: Cross sectional study.

Study duration: 1st of March 2009 to 30th May 2009

Study location: Government and Private Schools of Gwalior city

Study group: 200 school going children between the age group of 12 to 17 years.

Sampling frame: Government and Private School going children.

***Sampling design*:** Stratified Random Sampling.

Ethical consideration: Informed consent was sought from every respondent.

Data collection: After selecting the sample of 200 students from Government and Private School they all were interviewed by using a predesigned pretested semi structured proforma which was having the questionnaires regarding socio demographic details, determinants and various factors responsible for soft drinking etc.

Operational definition: Later on having started with interview, respondents were broadly categorized among three groups on the basis of their frequency of drinking which was like as follow:

Frequency of drinking	Category
100 to 200 ml 3 times/week or more	Frequent drinking
100 to 200 ml less than 3 times /week	Sometime drinking
0 to 100 ml less than 3 times/week	Less/no drinking

After abovementioned categorization, the whole data was distributed among these three broad categories.

Awareness of students for soft drinking hazards was assessed simply by asking, those who were able to give 3 or more names of hazards considered as aware.

B.G. Prasad classification was used for the assessment of socio economic class of students.

Data processing and analysis: After conducting the interview the data was collected and get it filled in the spreadsheet of MS Office excel 2007. Later on it was got analyzed manually and with the help of suitable statistical software. Data was again cross checked so that rectify any skipped writing or computer operating error.

Statistical test used: Various statistical tests were used to analyze the data like chi square test, association, mean, SD, simple percentage and proportions.

Results:

Out of all 200 students 44% students were having frequent soft drink consumption followed by some drinking 37% and 19% were having no or less drinking. Majority of frequent drinkers and some drinkers were found to be in private schools (p value <0.01).Though male were found to be more frequent consumers (61.36%) of soft drink than females (38.63%) but this difference was no where significant (p value >0.05).Out of all frequent and sometime drinkers majority of them were belonging to VIIIth to Xth standard (43.18%) followed by XIth and above (29.54%).(p >0.05).As far as socio economic class is concerned frequent drinking was more common among the students from higher classes (I-43.18%,II-25%,III-23.86%) whereas on the other hand students from lower class (IV-5.68%,V-2.27%) were consuming no or less drinking.(p <0.01). (Table 1)

Table 1: Socio Demographic Distribution of Students

Socio Demographic variable	Frequent drinking N= 88 (44%)		Some time drinking N= 74(37%)		No/Less drinking N = 38(19%)		Total N= 200
	N	%	N	%	N	%	
Type of school:							
Private	67	76.14	48	64.86	04	10.52	119
Government	21	23.86	26	35.14	34	89.47	81
Chi sq - 48.81; p value- 0.000001							
Sex:							
Male	54	61.36	41	54.40	17	44.73	112
Female	34	38.63	33	44.59	21	55.26	88
Chi sq - 2.99; p value-0.223							
Class:							
Vth to VIIth	24	27.27	23	31.08	17	44.73	64
VIIIth to Xth	38	43.18	28	37.83	13	34.21	79
XIth on wards	26	29.54	23	31.08	08	21.05	57
Chi sq - 4.13; p value- 0.388							
Socio economic class: (B.G.Prasad Classification)							
Class I	38	43.18	16	21.62	01	2.63	55
Class II	22	25	18	24.32	03	7.89	43
Class III	21	23.86	28	37.83	07	18.42	56
Class IV	05	5.68	07	9.45	11	28.94	23
Class V	02	2.27	05	6.75	16	42.10	23
Chi sq - 77.56; p value- 0.000001							

There was no significant difference was found for the awareness among the various groups of drinkers.(p>0.05).Heath education regarding soft drinking was not being given to majority of frequent and no/less drinkers (87.5%, 78.95%). Whereas it was found bit more among the sometime drinkers (62.16%). (p<0.01).Parents of majority of frequent and some time drinkers were also drinking (63.63%, 60.81%) on contrary majority of no/less drinkers were not having drinking parents (86.84%).(p<0.01).Majority of frequent (76.13%) and some time drinkers (68.91%) found easy availability of soft drink in their homes than no/less drinkers (7.89%). More or less same was found for the availability of soft drink in school or within 100 meter of its radius among the frequent, sometime and no/less drinkers. (p<0.01).Majority of frequent (65.90%) and sometime drinkers (59.45%) said that they many a times drink by peer pressure only whereas the figure was found very slim among the no/less drinkers. (p<0.01).Desire of new taste was somehow one of the factor which insist for drinking among the frequent (67.04%)and sometime drinkers (62.16%) as compared to no/less drinkers (7.89%). More or less same was found about the role of attention seeking in soft drinking. (p<0.01).TV watching was found to be significantly associated (p<0.01) with frequency of drinking. Majority of frequent and sometime drinkers were watching the TV 3-4hrs (38.63%, 39.18%) to 2-3hrs (26.13%, 24.32%) per day. Whereas 68.42% no/less drinkers were watching TV for 1-2hrs daily. Pocket Money also showed its association with soft drinking (p<0.01) in which majority of frequent and sometime drinkers were getting 20 to 40 Rs per day (63.63%,59.45%) than no/less drinkers who were on the other hand getting 0-20 Rs. per day (81.57%).(Table 2).

Table 2: Associations of Various Determinants with the Soft Drinking Consumption							
Determinants	**Frequent drinking N=88(44%)**		**Some time drinking N=74(37%)**		**No/less drinking N = 38(19%)**		**Total N=200**
	N	**%**	**N**	**%**	**N**	**%**	
Awareness about hazards:							
Yes	13	14.72	17	22.97	04	10.52	34
No	75	85.22	57	77.02	34	89.47	166
Chi sq - 3.39; p value- 0.191							
Health education by parents:							
Yes	11	12.5	46	62.16	08	21.05	65
No	77	87.5	28	37.83	30	78.95	135
Chi sq - 47.99; p value- 0.000							
Drinking of parents:							
Yes	56	63.63	45	60.81	05	13.16	106
No	32	36.36	29	39.18	33	86.84	94
Chi sq- 30.02; p value- 0.00001							
Availability at home							
Yes	67	76.13	51	68.91	03	7.89	121
No	21	23.86	23	31.08	35	92.10	79
Chi sq - 55.20; p value- 0.000001							
Availability in school or within 100 meter radius:							
Yes	63	71.59	54	72.97	06	15.78	123
No	25	28.40	20	20.02	32	84.21	77
Chi sq - 41.43; p value- 0.000							
Peer pressure:							
Yes	58	65.90	44	59.45	04	10.52	106
No	30	38.09	30	40.54	34	89.47	94
Chi sq - 34.65; p value-0.000							
Desire of new taste:							
Yes	59	67.04	46	62.16	03	7.89	108
No	29	32.95	28	37.83	35	92.10	92
Chi sq - 40.53; p value- 0.000001							
Attention seeking:							
Yes	65	73.86	48	64.86	01	2.63	114
No	23	26.13	26	35.13	37	97.36	86
Chi sq - 55.42; p value- 0.000001							
Hrs of TV watching/day:							
1-2 hrs	17	19.31	12	16.21	26	68.42	55
2-3 hrs	23	26.13	18	24.32	07	18.42	48
3-4 hrs	34	38.63	29	39.18	04	10.52	67
More than 4 hrs	14	15.90	15	17.04	01	2.63	30
Chi sq - 42.06; p value- 0.000001							
Pocket money per day (Rs.)							
0-20	16	18.18	12	16.21	31	81.57	59
20 to 40	56	63.63	44	59.45	02	5.26	102
40 or more	16	18.18	18	24.32	05	13.15	39
Chi sq - 64.31; p value- 0.000001							

Discussion:

Soft drink and fast food are energy dense foodstuffs that are heavily marketed to adolescents, and are likely to be important in terms of risk of obesity.[6]It is generally understood that soft drinks, even though they contain a large number of calories, have little nutritional benefit and are known as "empty calories". Soft drinks are composed mostly of filtered water with diet colas containing close to a hundred percent water. Most of the calories in soft drinks are from refined sugars, and there are no other nutritionally beneficial components in soft drinks. Dr. Charles Best, the discoverer of insulin, claims that teenagers who consume too many soft drinks have cirrhosis of the liver similar to what chronic alcoholics have.[7] A common problem that is associated with consumption of a large number of soft drinks is the increased acid levels throughout the body. All soft drinks are very acidic, but dark colas such as Coke and Pepsi are much more acidic.[3]

In present study 44% students were having frequent soft drink consumption followed by some drinking & no/ less drinking. Majority of frequent drinkers and some drinkers were found to be in private schools , this may be attributed to higher socio economic status of these students. Male were found to be more frequent consumers of soft drink than females Shi Z et al found over half of the boys and more than one third of the girls reported drinking soft drink daily, and consumption peaked in Grade 8 students. More than half of the students reported a liking for Western style fast foods including hamburgers, soft drinks and chocolate.[8] Many people consume soft drinks instead of necessary beverages like milk, so their bodies are not receiving enough nutrients, especially calcium .[3] a study concluded, "the high consumption of carbonated beverages and the declining consumption of milk are of great public health significance for girls and women, because of their proneness to osteoporosis in later life".[9,10]

High socio-economic status (SES) and urban residence was positively associated with intake of high-energy foods, such as foods of animal origin, Western style foods and dairy products.[8] in present study Frequent drinking was more common among the students from higher classes (I-43.18%,II-25%,III-23.86%) than students of lower class (IV-5.68%,V-

2.27%) .*Shi z et* al found among high SES boys, 21.5% consumed soft drinks on a daily basis; however, as many as 72.3% wanted to drink soft drinks more often if they could afford it.[8] SES and urban location were positively associated with frequency of intake of high-energy foods. Reported food preferences may enforce this trend.[8]

There was no significant difference was found for the awareness among the various groups of drinkers. It may be because majority of no/less drinkers were from lower classes where parental educational status is very low. So more longitudinal research is needed in representative sample. Heath education regarding soft drinking was not being given to majority of frequent and no/less drinkers. Whereas it was found bit more among the sometime drinkers (62.16%). So it shows the role of health education in better dietary practices among the households. Nutrition education for adolescents and parents is needed to promote healthy eating.[8] Grimm GC *et al* found that Youth whose parents regularly drank soft drinks were 2.88 times more likely to consume soft drinks five or more times per week compared with those whose parents did not regularly drink soft drinks.[5] In this study Parents of majority of frequent and some time drinkers were also drinking (63.63%, 60.81%). So role of parental dietary behavior is also important. Interventions designed to help adolescents improve consumption of fruits, vegetables and dairy foods may be enhanced by including a parental component aimed at increasing household availability and parents' intake of healthful food choices.[11]

Majority of frequent (76.13%) and some time drinkers (68.91%) found easy availability of soft drink in their homes than no/less drinkers (7.89%). More or less same was found for the availability of soft drink in school or within 100 meter of its radius among the frequent, sometime and no/less drinkers. Because students may purchase food and drinks in and around their schools, the school food environment may be important for obesity-related eating behaviors such as soft drink and snack consumption.[12] Denney-Wilson E *et al* found a quarter of students reported choosing soft drinks instead of water or milk, and around 40% agreed that soft drink was usually available in their homes. Availability in the home and drinking soft drinks with meals was most strongly associated with consumption in all age groups. Interventions to reduce consumption of soft drinks should target availability in both the home and school environment by removing soft drinks and replacing them with more nutritive beverages.[6] Adolescents' attitudes, subjective norms, parental and peer modeling, and intentions were positively associated with soft drink and snack consumption. There was an inverse association between the distance to the nearest store and the number of small food stores with soft drink consumption.[12]Majority of frequent (65.90%) and sometime drinkers (59.45%) said that they many a times drink by peer pressure only.

Desire to drink in children is related to a liking for consuming sweetened drinks, and does not appear to simply denote greater thirst or hunger.[13] Grimm GC *et al* found that preference for the taste of soft drinks was the strongest predictor in the analysis, with those who reported the strongest taste preference 4.50 times more likely to consume soft drinks five or more times per week than those with a lower taste preference.[5] in present study desire of new taste was somehow one of the factor which insist for drinking More or less same was found about the role of attention seeking .Several environmental factors influence adolescents' food habits and television (TV) viewing is thought to be one of these factors.[14]

Fruit and vegetable intake is low among European children and exposure to TV is negatively associated with the intake of fruit and vegetables.[15] TV watching was found to be significantly associated ($p<0.01$) with frequency of drinking. Majority of frequent and sometime drinkers were watching the TV 3-4hrs (38.63%, 39.18%) to 2-3hrs (26.13%, 24.32%) per day. Boys reported somewhat higher TV viewing than girls did and children from lower social classes reported higher TV viewing than higher social class children did.[15] Those most likely to watch TV were boys, 13-year-olds and pupils of lower socioeconomic status. Those who watched more TV were more likely to consume sweets and soft drinks on a daily basis and less likely to consume fruit and vegetables daily.[14] Pocket Money also showed its association with soft drinking ($p<0.01$).

Small sample, study at local level were some of the limitations of study, if it is done at nationwide level with more large and representative sample then findings will be more valid and generalizable.

Conclusions:

Soft drinking consumption is creeping day by day amongst the children without knowing their hazards. This sort of irrational and injudicious use of soft drink is definitely putting them at the edge of sward and many factors are playing their role to ensue such a risk like lack of awareness, environmental influences, parental drinking, pocket money, TV watching etc. They are the future of any country so there should be effective intervention from both sides govt. as well as parents like imparting an awareness campaign ,motivation from parents, Behavior change communication (BCC), Healthy TV watching & dietary behavior etc to get rid of its irrational use at earliest.

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