Somichon KSV
M.Sc., Department of Home
Science, Women's Christian
College, Chennai, Tamilnadu,
India

Dr. Sheila John
Supervisor and Head,
Department of Home Science,
Women's Christian College,
Chennai, Tamilnadu, India

T. Sivapriya
(Ph.D.), Department of Home
Science, Women's Christian
College, Chennai, Tamilnadu,
India

Factors associated with soft drink consumption among adolescents in the age group of 16-18

Somichon KSV, Dr. Sheila John and T Sivapriya

Abstract
Objectives: Adolescence has been staged an important period of changes, both physiological and psychological. During this time, altering lifestyle and dietary behaviours affects nutritional status. The association between lifestyle, consumption of soft drinks and health related risk factors has been a matter of concern these days. The present study was carried out to study the various factors affecting soft drink consumption and alcoholic drinks among adolescents.
Methods: Consumption pattern of soft drinks, health status and mental health were studied among five hundred adolescents using appropriate tools.
Results: Results indicated that majority of the adolescents 71.6 Percent had the habit of consuming soft drinks. About 22% agreed that soft drinks provides a sort of fun. Statistical inferences confirmed that there was no significant difference between mental health outcome, overall health status and soft drink consumption among selected adolescents.
Conclusion: It is essential that adolescents should be provided reliable nutrition information regarding sugary drinks consumptions and it adverse effects

Keywords: Adolescents, soft drinks, consumption pattern, health status

1. Introduction

Sugary drink consumption has risen dramatically over the past 40 years.. They include the full spectrum of soft drinks, fruit drinks, energy and vitamin drinks Sugary drink consumption increases the risk of obesity, diabetes, heart disease and gout [1]. There is increasing concern that intake of free sugars particularly in the form of sugar-sweetened beverages may reduce the intake of foods containing more nutritionally adequate calories, leading to an unhealthy diet, weight gain and increased risk of non-communicable diseases [2].

Soft drinks and alcohol consumption is highly visible and controversial among adolescents. Increase in the consumption of these drinks become an imperative reason to study what causes adolescents to consume more of soft drinks and alcohol in a social college atmosphere and their mental health outcome.

The fact that sugary drinks provide energy with little accompanying nutrition, replace other nutrient sources, and are linked to several key health conditions such as diabetes is further impetus to recommend a decrease in drink consumption. Recommendations to reduce soft drink consumption are strongly reinforced by health experts and are more critical at this juncture to tackle the issue of non-communicable diseases.

Thus the research aimed to study the factors associated with soft drink consumption among adolescents in the age group of 16-18 years. The study also focused on the anthropometric indices of the adolescents, the association between soft drink consumption adverse health effects, mental health outcome, stress level among adolescents due to soft drink consumption.

2. Materials and methods

The study protocol was reviewed and approved by the Institutional Independent Ethics Committee of the institution. Three hundred subjects (150 boys and 150 girls) aged 16-18 years studying in colleges were purposively selected to study the factors associated with soft drink and alcohol consumption.

Correspondence
Somichon KSV
M.Sc., Department of Home
Science, Women's Christian
College, Chennai, Tamilnadu,
India

2.1 Anthropometric assessment

Anthropometry is one of the most reliable and basic tools for assessing the nutritional health status of the individual. Their body weight, height, waist circumference and indices like body mass index (BMI) were measured.

2.2 Body mass index (BMI)

Body mass index is also known as Quetelet index. Using the height and weight the body mass index was calculated using the formula. Body Mass Index (BMI) = weight in kilogram/ height in meter^2

2.3 Measurement of waist circumference:

A non-stretchable measuring tape was used to measure the waist circumference. The tape was lightly applied to the skin surface so that it is taut but not tight. The waist was measured to the nearest 0.1 cm and ½ inch above the umbilicus.

2.4 Strength and difficulties questionnaire:

Strength and difficulties questionnaire (SDQ) [3] a self-report inventory behavioural screening questionnaire for children and adolescents. The respondents are asked to indicate whether a specific attribute is "not true", "somewhat true" or "certainly true."

2.5 Teen Stress scoring test

Stress scoring test [4] is done to see which category of stress the subjects fall in. Value life event is given with a scoring number on the left side and the subjects tick the event they have experience in the past year. When scoring is completed, summed up and assess which category of stress they come under.

2.6 Statistical analysis

P value of < 0.05 was considered significant for all the statistical tests. Chi-square was used to draw association of mental health outcome, soft drinks and alcohol consumption.

3. Results and discussion

Childhood obesity is a foremost public health problem in several countries across the world. Dietary strategies that could preclude excess weight gain in childhood are vital. There has been an increasing trend globally in the consumption of sugar-sweetened beverages amongst children. Energy from drinks accounts for 14% of energy intake in children aged between 4 and 18 years, with sugary drinks accounting for majority of that energy, being particularly high amongst adolescents.

Table 1 portrays that majority of the adolescents, 71.6 Percent consume soft drinks in which 35.6 Percent were girls and 36 Percent were boys. 28.3 Percent did not consume soft drinks of which 14.3 Percent were girls and 14 Percent were boys of the 300 respondents. It was evident from the study that majority 98.5 Percent of the respondents preferred drinks with sugar while 1.3 Percent of the respondents preferred a drink without sugar. 70.6 Percent of the respondents preferred drinking caffeinated drinks while 29.3 Percent of the respondents preferred a drinks without caffeine.

It can be inferred from table 2 that 63 Percent adolescents doesn't like the flavour or taste and 33.3 Percent specified that those drinks were not good for health. About 3.6 Percent stated that drinks are too fizzy and acidic to consume. The number of adolescent girls who disliked the taste or flavour of the soft drinks was higher than the adolescent boys. When factors that attract adolescents to consume softdrinks was scrutinised in table 3, nearly 19.6 Percent of the respondent consumed soft

drinks as it gave them a lift during the day, 21.6 Percent disagreed to this statement and 21.6 Percent were not interested to give their opinions. About 19.6 Percent of the respondents were hooked on soft drinks while 13.6 Percent disagreed to this statement and 20.6 Percent were not interested to give their opinions.

Almost 47.9 Percent of the respondents preferred to consume soft drinks during summer while 5 Percent disagreed and 11.6 never responded. Nearly 23.3 Percent of the respondents consumed soft drinks because it gave them a fuzzy feeling, 11.3 Percent disagreed and 22.6 Percent were not interested to give their opinions. 23.3 Percent avoided diet soft drinks as diet soft drinks gave headache, 26 Percent disagreed and 22.3 Percent indifferent to this statement. Also 41 Percent of the respondents consumed more of soft drinks than water.

Table 4 depicts that 27.3 Percent of parents of adolescent boys and 15.3 Percent of parents of adolescent girls purchased soft drinks for their children, while for 19.3 Percent of adolescent girls and 38 Percent siblings purchased soft drinks, 54 Percent of boys and 36 Percent of girls purchased soft drink by themselves.

Table 5 reveals the mean anthropometric indices. It was evident that 60.3 Percent of adolescent boys and 60 Percent of the girls were in normal BMI range, while one Percent of adolescent boys and girls were overweight and obese respectively. Results of the present study were similar to [5] that most of the subject's BMIs were within the normal range of 86.1 Percent. Approximately 5 Percent were overweight, 8 Percent were obese and only 1.5 Percent were underweight.

In table 6, When appetite of the participants were correlated with soft drink consumption, it was found that the P Value was >0.05. There was no significant difference between the appetite and consumption of soft drink between consumers and non-consumers. Interpretation of Strength and difficulties questionnaire in table 7 revealed that 62 Percent of soft drinks consumers didn't t face any emotional problem. While 14% had few problems. With regards to conduct problem scale it was found that majority were in normal range while fourteen Percent consumer were in borderline and soft drinks consumer had more conduct problem than non -consumer. With regards to hyperactivity scale it was found that majority of the consumer and non -consumer are in a normal range. With regards to prosocial scale it was found that majority of the participants both consumer and non -consumer are not socialised and were not involved in volunteering

According to [6] conduct problem score was inversely correlated with the recognition of anger, fear and sadness. Adolescents with high conducts problems score were significantly worst in the recognition of fear, sadness and overall recognition than adolescents with low conduct scores irrespective of age and IQ. Inadequate patterns of family interactions practices in childhood can influence the course of disorder, aggravate its signs and symptoms and contribute to the secondary development of other behavioural problems such as oppositional defiant disorder and aggressiveness [7] Statistical interpretation of table 8 confers that there is no significant difference between mental health outcome and soft drink consumption among consumer and non- consumer. P value is found to be greater than 0.05.

3.1 Teen stress test

Stress is one of the most problem in which the adolescent face during their physical and physiological changes. Stress is challenging and potentially threatening events and situations. Teen stress test were used to see the value life event that is

hindering in the situation of their daily life. Stress scoring test is done to see which category of stress they fall in. Value life event is given with a scoring number on the left side and the subjects tick the event they have experience in the past year. When scoring is finished, score is total up and see which category of stress they fall in.

Analysis of teen stress scale in table 9 shows that 12.3 Percent of the respondents fall in the category of 0-49 score which illustrates that respondents had an extreme low stress, 20 Percent fall in the category of 50-99 in which the respondents experience a very little stress. About 34.3 fall in the category of 100-199 in which the respondents experience a mild stress and were able to handle. It was inferred that 26 Percent fall in the category of 200-299 in which the respondents experience a moderate levels of stress and 7.3 Percent fall in the category of above 300 in which the respondents are likely to experience extreme levels of stress.

Adolescents are more vulnerable to stress because of the rapid physical and psychological changes. Stress is an uneasy feeling that we all go through in our life. During adolescence, they imbibe both positive and negative things from their parents and environment. The choice they make in this phase is very much dependent upon the upbringing they get and expectations from family, society, and peers and more importantly their own [8].

Statistical analysis reveals that there is no significant difference between value life event and soft drink consumption among the consumers and non- consumers. The P value is found to be 0.700.

3.2 Peer and parental influence on consumption pattern of soft drinks

Table 10 revealed that influence of peers in consuming soft drink was higher than the parents. About 27 Percent of the respondent's peers influenced to consume soft drinks frequently, 58 Percent of the respondents peers influenced rarely while 15 Percent of peers did not influence at all. About 23 Percent of the respondent's parents were found to influence the consumption of soft drinks to the respondents by the parents while majority (77%) of the respondent's parents did not influence the consumption of the soft drinks.

It was witnessed from table 11 that peer influence has significant influence on the soft drink consumption pattern of Consumers. Chi square value is found to be 14.318 and P value 0.00. The results are statistically significant at 5%.

Table 1: Percent distribution of soft drink consumption

Consumption habits	Girls		Boys		Total	
	N=150	Percent	N=150	Percent	N=300	Percent
Consumer	107	71.3	108	72	215	71.6
Non consumer	43	28.6	42	28	85	28.3

Table 2: Percentage distribution of consumer's aversion towards soft drinks

Variables	Consumers				Total	
	Girls		Boys			
	N=68	Percent	N=43	Percent	N=111	Percent
Dislike the taste or savour	53	77.9	17	39.5	70	63
Not good for health	14	20.5	23	53.4	37	33.3
Very fizzy	1	1.4	3	6.9	4	3.6

Table 3: Percentage distribution of factors that influence soft drink consumption

Variables	Disagree		Total	Indifferent		Total	Agree		Total
	Boys	Girls		Boys	Girls		Boys	Girls	
	Percent	Percent		Percent	Percent		Percent	Percent	
Soft drinks give a lift during the day	9.6	12	21.6	10	11.6	21.6	10	12	22
Hooked on soft drinks	2.6	21.6	23.6	9	11.6	20.6	17.3	2.3	19.6
Give a fizzy feeling	6	5.3	11.3	12	10.6	22.6	18	5.3	23.3
Diet soft drinks give headache	13	13	26	11	11.3	22.3	12	11.3	23.3
Do not drink soft drink with sugar	12	10	22	15	16	31	9	21	30
Bad for the person health	6	5.6	11.6	17	17	34	13	13	26
Consume more soft drinks than water	0	0	0	15	15.6	30.6	21	20	41
Drink a lot of soft drinks when alone	36	35.6	71.6	0	0	0	0	0	0
Drink a lot of soft drinks with friends	15	15.6	30.6	12	11.3	23.3	9	8.6	17.6
Parents tell that soft drinks are bad for health	7	6.6	13.6	13.6	12	15.6	15.3	17	32.3

Table 4: Percentage distribution of persons who purchase soft drinks for participants.

Person	Boys		Girls	
	N=150	Percent	N=150	Percent
Mother/Father	41	27.3	23	15.3
Brother /Sister	29	19.3	45	38
Servant	17	11.3	10	6.6
Yourself	81	54	54	36

Table 5: Mean Percent distribution of subjects based on body mass index

Classification	Cut off values of BMI	Boys		Girls	
		N=150	Percent	N=150	Percent
Underweight	< 18.5	57	38	58	38.6
Normal range	18.5-24.9	92	61.3	90	60
Overweight	≥ 25-29.9	0	0	4	2.6
Obese	> 29.9	1	1.1	2	1.3

Source: WHO BMI Classification. 2011

Table 6: Association between appetite and soft drink consumption

Appetite	Consumption pattern				Chi – square value	p value	Level of significance
	Consumer %		Non-consumer%				
	Girls	Boys	Girls	Boys			
	35.6	36	14.3	14	0.087	0.957	NS

NS-Not sign

Table 7: Interpretation of Strength and difficulties questionnaire (Goodman, 1997)

Particulars	Risk scores	Consumption %							
		Consumers				Non consumers			
		Boys		Girls		Boys		Girls	
		N=300	Percent	N=300	Percent	N=300	Percent	N=300	Percent
Emotional symptoms scale	Normal 0-3	62	20.6	78	26	34	11.3	27	9
	Borderline 4	14	4.6	11	3.6	7	2.3	3	1
	Abnormal 5-40	32	10.6	19	6.3	1	0.3	13	4.3
Conduct problem scale	Normal 0-2	78	26	64	21.3	35	11.6	29	9.6
	Borderline 3	17	5.6	24	8	5	1.6	7	2.3
	Abnormal 4-10	13	4.3	19	6.3	2	0.6	7	2.3
Hyperactivity scale	Normal 0-5	93	31	86	28.6	41	13.6	41	13.6
	Borderline 6	4	1.3	8	2.6	1	0.3	1	0.3
	Abnormal 7-10	10	3.3	13	4.3	0	0	1	0.3
Peer problem scale	Normal 0-2	7	2.3	13	4.3	2	0.6	4	3.3
	Borderline 3	13	4.3	14	4.6	5	1.6	4	3.3
	Abnormal 4-10	88	29.3	80	26.6	35	11.6	35	11.6
Pro social scale	Normal 6-10	22	7.3	32	10.6	4	1.3	13	4.3
	Borderline 5	32	10.6	41	13.6	8	2.6	13	4.3
	Abnormal 0-4	54	18	34	11.3	30	10	17	5.6

Table 8: Association between mental health outcome and soft drink consumption among consumers and non- consumers

S. No	Mental health outcome	Consumer %		Non consumer %		't' test	P value	Level of significance
		Boys	Girls	Boys	Girls			
1	Emotional problem scale	36			14.3	-1.388	0.166	NS
2	Conduct problem scale					-1.465	0.144	NS
3	Hyperactivity scale		35.6	14		-5.12	0.609	NS
4	Peer problems scale					-0.865	0.388	NS
5	Prosocial scale					1.904	0.058	NS

NS-Not significant

Table 9: Percentage distribution of Teen stress scale score

Scoring	N =300	Percent
0-49 (extreme low)	37	12.3
50-99 (very little stress)	60	20
100-199 (mild stress)	103	34.3
200-299 (moderate)	78	26
>300 (high stress)	22	7.3

Table 10: Peer and parental influence on consumption pattern of soft drinks.

Variables	Influence by peer		Influence by parents	
	N=300	Percent	N=300	Percent
None	44	15	232	77
Few	175	58	68	23
All	81	27	0	0
Total	300	100	300	100

Table 11: Association peer influence and soft drink consumption

Peer influence	Consumption pattern				Chi – square value	p value	Level of significance
	Consumer %		Non-consumer%				
	Girls	Boys	Girls	Boys			
	4.3	5.3	45.7	44.7	14.318	0.000	5%

5% significant

4. Conclusion
Adolescence is the time of transition physically and psychologically. In this period, many lifelong health habits are formed, especially dietary habits. Soft drinks and fast foods are energy dense food stuffs that are heavily marketed to adolescents. Furthermore, inadequate dietary practices, such as skipping meals and substituting snacks for traditional meals such as lunch and dinner, are common. Therefore, it is important that adolescents have reliable nutrition information regarding dietary patterns and practices

School-based education programmes focusing on reducing sugar sweetened beverage consumption and including follow-up modules offer opportunities for implementing effective, sustainable interventions. Peer support and changing the school environment (e.g. providing water or replacement drinks) to support educational programmes could improve their effectiveness. Home delivery of more suitable drinks has a big impact on reducing sugar sweetened beverage consumption, with associated reductions in body weight.

5. References
1. Pan X, Zhang C, Shi Z. Soft drink and sweet food consumption and suicidal behaviours among Chinese adolescents. Acta Paediatr. 2011: 100:215-222.
2. World Health Organization, Global strategy to reduce the harmful use of alcohol, 2010, http://www.who.int/substance_abuse/msbalcstragegy.
3. Goodman R. The Strengths and Difficulties Questionnaire: A Research Note. Journal of Child Psychology and Psychiatry. 1997: 38:581-586.
4. Teen stress test. Mental Health America of Northern Kentucky and Southwest Ohio http://www.mhankyswoh.org/
5. Estima C, Philippi T, Araki L, Leal G, Martinez MF, Alvarenga M., *et al.* Beverage and soft drink consumption by adolescents from a public school Rev. Paul Pediatr.2011; 29(1):41-5.
6. Pirinen T, Kolho KL, Ashorn M, Aronen E. Sleep and emotional and behavioural symptoms in adolescents with inflammatory bowel disease, 2014.
7. Wang CH, Mazursky H, Chronis T. Delivery evidence-based treatment for child attention deficit/ hyperactivity disorder (ADHD). Current psychiatry reports. 2014; 16:473-481.
8. Huli PR. Stress management in adolescence. Journal of research in humanities and social science. 2014; 2:50-57.