

Prevalence of Tea, Coffee and Nescafe Consumption among High School Students and its Relationship with Depression and Anxiety

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Abstract

Background: The aim of this study was to investigate prevalence of tea, coffee and Nescafe consumption among high school students in Shiraz, Iran and find out whether there is a relationship between these three beverages with depression and anxiety.

Methods: A cross-sectional survey was conducted among high school students in Shiraz, Iran in 2014. A total of 1020 students, including 510 female (50%) and 510 male (50%), were interviewed according to Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) criteria. Data were collected using Demographic, anxiety and depression questionnaires. The obtained data were analyzed using SPSS version 16. We used descriptive methods, Chi square tests and Pearson correlation.

Results: Prevalence of tea, coffee and Nescafe consumption in high school students in Shiraz was 79.5%, 54% and 54% respectively. There was an inverse significant relationship between consumption of these three beverages with depression and anxiety ($P < 0.05$).

Conclusion: We found out that prevalence of tea, coffee and Nescafe consumption among high school students was considerable and that of tea consumption was more than two other beverages. Also our findings support an inverse relationship between tea, coffee and Nescafe consumption with anxiety and depression.

Keywords: Tea; Coffee; Nescafe; Anxiety; Depression

Introduction

Tea is a beverage that is prepared by pouring boiling and hot water over its leaves [1]. After water, tea is the most consumed beverage in the world [2]. Probably for the first time in China, tea was used as a medicinal drink [3,4]. Each year three billion kilograms of tea are produced worldwide. Black tea and green tea both come from the same plant. The difference is that the green tea leaves are steamed, and then dried. But black tea leaves are dried, fermented, and sometimes chemical materials and colors are added. The statistical analysis revealed that about 80% of the Japanese drink green tea and more than half of them do so three or more cups daily. The researchers also found that the benefits of green tea are greater in women. It increases the longevity told by Ulrike et al. [5,6]. In addition to tea, coffee is a common drink in the world [7]. It seems that for the first time coffee has been used in Ethiopia [8]. Caffeine is a natural alkaloid compound, found in the coffee beans and tea leaves and is the most common nervous system stimulant and approximately 80% of its consumption is in the form of coffee said by Lucas [9]. In North America and Europe, the primary source of caffeine is from coffee and tea. According to statistics, 90% of the adult population in America consumes caffeine [10-11]. In the world, 89% of people use coffee, tea, or both. 40% of them prefer to drink tea and if there is no tea, they drink coffee and also 30% of them prefer to drink coffee and if there is no coffee available, they drink tea. For about 15% of people, there is no difference between coffee and tea and availability is important.

Nevertheless, 15% of people also do not like coffee and tea and do not drink any of them [12]. Nescafe is instant coffee that was first produced in 1907 [13,14] and quickly became common in the world [15]. The amount of caffeine in a cup of coffee is equal to 150 cc. Nescafe contains 30 to 120 mg of caffeine. Caffeine cannot be isolated from coffee completely. So, even decaffeinated types of coffee also have a small amount of caffeine [16]. The prevalence of the consumption of these three beverages is different in the world. Many studies have surveyed risks and benefits of these three drinks. Some studies have indicated that tea or coffee improve some diseases [cardiovascular disease, type II diabetes, certain cancers, such as prostate cancer and skin cancer, liver cirrhosis, Parkinson's and Alzheimer diseases, depression and anxiety Abel [7,17-21] and some have suggested the opposite Onuegbu [22] and Zhu et al. [23,24]. In this study we aimed to find out whether there is a relationship between these three drinks with depression and anxiety or not. Depression is a chronic disease that affects women twice as much as men and almost 20% of American women experience it in their lifetime [9]. Approximately, 17% of people in the world suffer from major depression. It is estimated that 1 million people worldwide commit suicide each year due to depression [25]. Anxiety is one of the most common psychological disorders especially in school-aged children and adolescents worldwide Tunnicliffe [26]. Because these three beverages are common in Iran especially among adolescents, we decided to survey their prevalence among high school students in Shiraz and because depression and anxiety are also common in this group of population, we assessed the relationship between these three drinks with depression and anxiety.

Material and Methods

A cross-sectional survey was conducted among high school students in Shiraz, Iran in 2014. A total of 1020 students, including 510 female (50%) and 510 male (50%), from 4 different districts in Shiraz, were selected based on cluster random sampling. The students were from 10 high schools and were interviewed according to Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) criteria. Before the interview, we explained the goal of the study and ensured the students about the confidentiality. We asked them not to say anything about their name, family or student number. Data were collected using Demographic, anxiety and depression questionnaires. Also we asked them about consumption of tea, coffee and Nescafe and the number of times they used them (occasional, frequent, regular, dependent and abuser). The pilot study of the questionnaire was applied to 30 high school students and favorable results were obtained. The gathered data were analyzed by SPSS, version 16. We used descriptive methods, Chi square tests and Pearson correlation. We had some items in our questionnaires the definitions of which are below: Definitions: No: No sign and symptom detected

Mild depression: Decreased mood, symptoms of anxiety, and increased symptoms in the afternoon, without suicidal idea.

Moderate depression: Decreased activity, depressed mood, agitation, decreased energy, decreased concentration, sense of guilt, hypochondriacs, sleep disturbance, depersonalization symptoms, and decreased appetite and decreased sexual activities.

Severe depression: Nihilistic delusions and auditory and visual hallucinations.

(Categorized International Statistical Classification of Diseases and Related Health Problems ICD),

Occasional: Once per month or less.

Frequent: Once per week or less.

Regular: Twice per week or more.

Dependent: Withdrawal symptoms after discontinuing.

Abuser: Dependent and dysfunction symptoms.

Results

The mean age of the students was 16.3(SD: 4.23), (in: 15 and Max 19); the mean age of female students was 15.9(SD: 3.38) and that of males was 16.7(SD: 4.61). 510(50%) students were female and the other was male. 277(27.2%) of them were in the first year, 242 (23.7%) in the second year and 501(49.1%) in the third year of high school. 140(13.7%) students were in a low economic status (less than 3000000 RIALS per months), 807(79.1%) in moderate economic status (3000000 -10000000RIALS per months), and 62(6.1%) students in high economic status (more than 10000000 RIALS per months). 209 (20.9%) students didn't drink tea. Prevalence of tea consumption is seen in Table 1. There wasn't any significant correlation between tea consumption and sex of the students. 13.1% of females and 13.3% of males were dependent on tea. A significant correlation was seen between tea consumption and year of education ($P < 0.01$) and also economic status ($P < 0.01$). Students who were in a moderate economic status drank more tea (80%) and tea consumption was lower in high economic status (6.1%). 27.4% of the students with high economic status were dependent on tea and it was seen more in them than the other groups.

Amount of consumption	Tea consumption frequency (%)	Coffee consumption frequency (%)	Nescafe consumption frequency (%)
No	209 (20.5)	469 (46.0)	467 (45.8)
Occasional	67 (6.6)	440 (43.1)	434 (42.5)
Frequent	51 (5.0)	48 (4.7)	55 (5.4)
Regular	558 (54.7)	46 (4.5)	53 (5.2)
Dependent	135 (13.2)	17 (1.7)	11 (1.1)
Total	1020 (100.0)	1020 (100.0)	1020 (100.0)

Table 1: Prevalence of tea, coffee and Nescafe consumption among high school students.

Reason	Tea consumption frequency (%)	Coffee consumption frequency (%)	Nescafe consumption frequency (%)
Rest	454 (76.3)	14 (2.8)	12 (2.4)
Occasional	8 (1.3)	7 (1.4)	4 (0.8)
Interest	124 (20.8)	33 (6.7)	39 (7.9)
Sedation	3 (0.5)	0 (0.0)	0 (0.0)
Studying preparation) (Exams	6 (1.0)	439 (89)	435 (88.6)
working	0 (0.0)	0 (0.0)	1 (0.2)
Total	595 (100.0)	493 (100)	491 (100.0)

Table 2: Reasons of tea, coffee and Nescafe consumption among high school students.

The third year students use more tea (49.1%) but dependence on tea was more among the first year students (21.7%). There was no significant correlation between the reason of tea consumption and depression and anxiety among the students. Reasons of tea, coffee and Nescafe consumption are shown in Table 2. There was an inverse linear significant correlation between tea consumption and prevalence of anxiety ($P < 0.01$) and also an inverse linear relationship between tea consumption and prevalence of depression ($P < 0.01$). Students who consumed tea regularly had lower levels of anxiety. Table 3 shows the prevalence of anxiety and depression among students who drank tea. 469 (46%) of the students didn't drink coffee. Prevalence of coffee consumption is seen in Table 1. Coffee consumption had a linear significant relationship with sex ($P < 0.05$). 287 female students and 264 male students were drank coffee. Dependence on coffee was more in females (64.7%). There was a significant relationship between coffee consumption and year of education ($P < 0.01$) and also with economic status ($P < 0.01$). Third year students drink coffee more (49.1%) but dependence on it was more among the first year students (3.2%). Dependence on coffee consumption was more in high socio economic status (8.1%) but students who were in moderate socio-economic status drank more coffee (80%). There was an inverse linear significant relation between coffee consumption and prevalence of anxiety ($P < 0.01$) and also with prevalence of depression ($P < 0.01$). Students who drank coffee occasionally had lower levels of anxiety and depression than others. Table 4 shows the prevalence of anxiety and depression

among students who drank coffee. There wasn't a significant correlation between the reason of coffee consumption and depression and anxiety. 467(45.8%) students didn't drink Nescafe. Prevalence of Nescafe consumption is seen in Table 1. 262 male students and 291 female students consumed Nescafe. There was a statistically significant relationship between Nescafe consumption and sex ($P < 0.01$), year of education ($P < 0.01$) and socio-economic status ($P < 0.01$). Dependence on Nescafe was more in males (1.2%), high socio-economic status (3.2%) and first year students (1.4%). However, third

year students (49%) and moderate socio-economic group (80%) drank more Nescafe. There was an inverse significant relationship between Nescafe consumption and prevalence of depression and anxiety ($P < 0.05$). Students who consumed Nescafe occasionally had lower levels of anxiety and depression than others. Cause of Nescafe consumption had no significant correlation with anxiety and depression. Table 5 shows the prevalence of anxiety and depression among the students who consumed Nescafe. In this study, none of the students was an abuser in tea, coffee and Nescafe consumption.

Tea consumption	Prevalence of anxiety				Total	Prevalence of depression				Total
	No	Mild	Moderate	Sever		No	Mild	Moderate	Sever	
No	152	34	15	7	208	166	25	12	4	207
	73.10%	16.30%	7.20%	3.40%	100.00%	80.20%	12.10%	5.80%	1.90%	100.00%
Occasional	39	16	9	3	67	51	10	5	1	67
	58.20%	23.90%	13.40%	4.50%	100.00%	76.10%	14.90%	7.50%	1.50%	100.00%
Frequent	33	12	4	2	51	40	8	3	0	51
	64.70%	23.50%	7.80%	3.90%	100.00%	78.40%	15.70%	5.90%	0.00%	100.00%
Regular	521	17	17	3	558	515	26	10	2	553
	93.40%	3.00%	3.00%	0.50%	100.00%	93.10%	4.70%	1.80%	0.40%	100.00%
Dependent	91	28	9	7	135	95	29	7	2	133
	67.40%	20.70%	6.70%	5.20%	100.00%	71.40%	21.80%	5.30%	1.50%	100.00%
Total	836	107	54	22	1019	867	98	37	9	1011
	82.00%	10.50%	5.30%	2.20%	100.00%	85.80%	9.70%	3.70%	0.90%	100.00%

Table 3: Prevalence of anxiety and depression among students who used tea.

Coffee consumption	Prevalence of anxiety				Total	Prevalence of depression				Total
	No	Mild	Moderate	Sever		No	Mild	Moderate	Severe	
No	345	72	40	12	469	364	65	26	7	462
	73.60%	15.40%	8.50%	2.60%	100.00%	78.80%	14.10%	5.60%	1.50%	100.00%
Occasional	414	13	6	7	440	422	12	5	1	440
	94.10%	3.00%	1.40%	1.60%	100.00%	95.90%	2.70%	1.10%	0.20%	100.00%
Frequent	33	10	5	0	48	39	6	2	0	47
	68.80%	20.80%	10.40%	0%	100.00%	83.00%	12.80%	4.30%	0.00%	100.00%
Regular	35	8	1	2	46	34	9	2	0	45
	76.10%	17.40%	2.20%	4.30%	100.00%	75.60%	20.00%	4.40%	0.00%	100.00%

Dependent	9	4	2	1	16	8	6	2	1	17
	56.30%	25.00%	12.50%	6.30%	100.00%	47.10%	35.30%	11.80%	5.90%	100.00%
Total	836	107	54	22	1019	867	98	37	9	1011
	82.00%	10.50%	5.30%	2.20%	100.00%	85.80%	9.70%	3.70%	0.90%	100.00%

Table 4: Prevalence of anxiety and depression among students who drink coffee.

Nescafe consumption	Prevalence of anxiety				Total	Prevalence of depression				Total
	No	Mild	Moderate	Sever		No	Mild	Moderate	Sever	
No	336	74	42	15	467	360	73	19	7	459
	71.90%	15.80%	9.00%	3.20%	100.00%	78.40%	15.90%	4.10%	1.50%	100.00%
Occasional	415	11	6	2	434	417	10	6	1	434
	95.60%	2.50%	1.40%	0.50%	100.00%	96.10%	2.30%	1.40%	0.20%	100.00%
Frequent	39	9	5	2	55	41	10	4	0	55
	70.90%	16.40%	9.10%	3.60%	100.00%	74.50%	18.20%	7.30%	0%	100.00%
Regular	39	10	1	3	53	43	2	7	0	52
	73.60%	18.90%	1.90%	5.70%	100.00%	82.70%	3.80%	13.50%	0.00%	100.00%
Dependent	7	3	0	0	10	6	3	1	1	11
	70.00%	30.00%	0%	0%	100.00%	54.50%	27.30%	9.10%	9.10%	100.00%
Total	836	107	54	22	1019	867	98	37	9	1011
	82.00%	10.50%	5.30%	2.20%	100.00%	85.80%	9.70%	3.70%	0.90%	100.00%

Table 5: Prevalence of anxiety and depression among students who drink Nescafe.

Discussion

In this study, we found out that prevalence of tea, coffee and Nescafe consumption in high school students in Shiraz is 79.5%, 54% and 54% respectively. Tea consumption is more than two the other beverages. We can conclude that availability and inexpensiveness of tea, lack of national media advertisements about coffee and Nescafe in Iran, and people's conception about harmful effects of coffee and Nescafe for health are the main reason. Our data indicate that tea consumption is more among male students but coffee and Nescafe consumption is consumed more by female students. In one study done among soldiers in America, it was found that 82% of soldiers used caffeine at least once a week and coffee was the most source for caffeine and also caffeine intake was higher among male soldiers [12]. Third year students and moderate socio-economic status group were using more tea, coffee and Nescafe. However, dependence on these three beverages was higher in the first year students and high socio-economic status group. Due to more important final exams in the 3rd year students than 1st and 2nd year, maybe they use these drinks as anti-anxiety. In one article conducted in South Korea, it has been indicated that prevalence of sugar-sweetened beverages like sports/energy drinks, coffee/tea products, and flavored milk are increasing among adults from 62% to 69% and by the elderly from 30% to 47% between 2001 and 2009. It was higher among high socio-economic status stated by Niu et al. [27]. In other study, their results showed that 30% of athletes

drank more than 1 mg/kg/day caffeine and the majority of high-level Canadian athletes consume dietary caffeine primarily in the form of coffee [28]. We understood that there was an inverse relationship between tea, coffee, Nescafe consumption with depression and anxiety. It means that students who consumed these three beverages had lower depression and anxiety signs and symptoms. Recent studies have investigated the effect of tea and coffee consumption on depression and anxiety. Many of them have shown that those who drink a considerable amount of tea and coffee have noticeably lower symptom of anxiety and depression. For example, Liu expressed antidepressant-like activity of the tea polyphenols on mouse [29] suggested that green tea is a potential candidate for the treatment of stress and depression [30,31]. In an article conducted on a total of 537 men and women aged 20-68 years suggested that higher consumption of green tea, coffee and caffeine may cause protection against depression Said by Hoaza et al. [32]. In a study done among Finnish general population (n = 2011), an inverse relationship between daily tea drinking and the risk of being depressed was found by Loak [33]. In 2009 a cross-sectional study among 42,093 Japanese individuals aged ≥40 y from the general population showed that Green tea consumption was inversely associated with psychological distress Feng [34]. A study indicated that Thiamine in green tea may play a role in reducing stress [4]. But Loke, in an article included that caffeine increases anxiety, tenseness, and nervousness [35].

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Some studies revealed that tea and coffee consumption is associated with better cognitive performance and another study pointed out that daily caffeine intake (100 mg) including green tea, black tea, coffee and other caffeine-containing beverages was associated with a higher risk of mental ill-health among females (OR = 1.26, 95% CI = 1.01-1.56). An interesting result that we found was that drinking by tea leads to relaxation and this is the most important reason of tea consumption among students. However, the most important reason for coffee and Nescafe consumption was for studying and exam preparation. A good reason for these results is that the most general population in Iran thinks that tea is good for relaxation and rest but coffee and Nescafe are good for insomnia. It seems that more recent studies found out a positive effect of tea, coffee and Nescafe consumption on depression and anxiety. We need more research to understand the true mechanism of these drinks on depression and anxiety. To the best of our knowledge, there was no other study on high school students and we know that anxiety and depression are common in this age group, so it seems that further research should be done on this group for evaluating the effect of tea and coffee and Nescafe consumption.

Limitations

This study had some limitations; we can't generalize these results to other students and adolescents. So each community needs specific studies.

Conclusion

We found that prevalence of tea, coffee and Nescafe consumption among high school students are considerable and that of tea consumption is more than the other two beverages. Also, our findings support an inverse relationship between tea, coffee and Nescafe consumption with anxiety and depression.

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