DOI: https://doi.org/10.53350/pjmhs2023174626

ORIGINAL ARTICLE

Readiness to Refrain from Carbonated Drinks among High School Female Students: The Transtheoretical Model of Change as a Theoretical Framework

HAWRAA KAREEM ABED ALI[1], WISSAM JABBAR QASIM[2]
[1]Teaching Assistant, Community Health Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq.
[2]Professor, Community Health Nursing Department, College of Nursing, University of Baghdad, Baghdad, Iraq.
Correspondence to: Hawraa Kareem Abed Ali, Email: hawraahk@conursing.uobaghdad.edu.iq

ABSTRACT

Objective: This study is a part of randomized controlled trial. This study aims to identify high school female students' readiness to refrain from carbonated drinks.

Method: The study included a simple random sample of 144 high school female students who were recruited from Al-Russafa High School for females in Baghdad City. The study instrument consists of participants' sociodemographic characteristics of age, living arrangement, and family's socioeconomic status, Stages of Change for Carbonated Drinks Consumption Behavior Scale (Short Form), Stages of Change for Carbonated Drinks Consumption Behavior Scale (Continuous Measure), The Processes of Change for Carbonated Drinks Consumption Behavior Scale, The Self-Efficacy for Carbonated Drinks Consumption Behavior Scale which includes 18 Decisional Balance Scale for Carbonated Drinks Consumption Behavior. Data were analyzed using the statistical package for social science (SPSS) for Windows, version 26.

Results: More than half are in the Precontemplation Stage of Change (n = 84; 58.3%), followed by those who are in the Preparation Stage of Change (n = 30; 20.8%), those who are in the Contemplation Stage of Change (n = 28; 19.5%), and those who are in the Maintenance Stage of Change (n = 2; 1.4%).The regression model displays that the family's socioeconomic status, Self-Liberation, and students' age positively predicted the Stages of Change to refrain from carbonated drinks (p-value = .004, .009, 035) respectively.

Conclusion: The regression model displayed that Self-Liberation and students' age positively predicted the Stages of Change to refrain from carbonated drinks. This finding implies that .The regression model displayed that students' age positively predicted the Stages of Change to refrain from carbonated drinks.

Keywords: Carbonated Drinks; Readiness to Refrain; High School Female Students.

INTRODUCTION

Carbonated drinks (CDs) are among the most consumed liquids worldwide, and in many nations, they represent a significant source of free sugars [(1)]. The key ingredients in carbonated beverages are carbonated water, citric acid, sugar, and caffeine. All carbonated drinks include acid. The usage of carbonated beverages has increased recently, but its constituents have also been discovered to be toxic and linked in the development of cancer [(2)].

Numerous adverse health outcomes, such as obesity, type 2 diabetes, an increased risk for cardiovascular illnesses, dental erosion, and dental caries, are linked to high intake of sugar-sweetened and acidulated beverages, including energy drinks and soft drinks [(3)]. Carbonated drinks are linked to an increase in the prevalence of obesity, type II diabetes, or metabolic syndrome [(4)]. Obesity, in turn, is associated with increased risk of illness, disability, and death [(5)]. Furthermore, it has been demonstrated in earlier studies that carbonated beverages contain methylglyoxal (MG), a highly reactive carbonyl molecule that is a significant precursor of advanced glycation end products (AGEs) and exhibits toxicity in cells and tissues [(6)].Soft drinks are more widely available on the market, and their use has increased, particularly among young people and children [(7)]. These carbonated beverages and energy drinks include acids like citric or phosphoric acid, artificial sweeteners, colouring additives, and caffeine. Consuming energy drinks may result in caffeine intoxication, sleep disruption and insomnia, as well as hyperactive and dangerous behaviours, according to the known effects of caffeine [(8)]. Carbonated drinks are beverages that, for various reasons, contain dissolved carbon dioxide (CO2). Many consumers find the effervescent sensation to be enjoyable and enjoy the slightly different flavor that carbon dioxide imparts [(9)].Adolescence, one of the most crucial stages of life, is a period of transition from childhood to adulthood between ages 10 and 19 years [(10)]. Adolescence is a distinct phase of the human lifecycle, during which adolescents go through essential physiological, psychological, and social development. For optimal growth and development, it is recommended to adopt healthy diets leading to an improved health status. A healthy diet is beneficial for adolescents in reducing the risk of malnutrition in all its forms and protecting against many non-communicable diseases, such as obesity, diabetes, cardiovascular disease, and certain types of cancer. However, as a result of industrialization, urbanization, and globalization, dietary habits have changed. Sadly, an unhealthy diet (such as carbonated drinks, sugary snacks, and energy drinks) replaced a healthy diet (such as milk, vegetables, and fruit), particularly among children. The World Health Organization shows that insufficient dietary habits have become a health risk [(11)]. This goes in line with that obtained by Idean and Abdel Wahid [(12)] who concluded that eating at night predicts children's weight status. Recent research indicates that adolescents are the largest consumers of carbonated drinks. Teenagers must not have paid attention to the controversies surrounding what soft beverages are and their negative health effects to avoid them. They cause health problems get to them [(13)]. A study was conducted in Iraq by Jawad reported that less than a half of participants in the study group reported that they exercise regularly with longer interruptions [(14)]. This study aims to identify high school female students' readiness to refrain from carbonated drinks.

METHOD

This study is a part of randomized controlled trial which included a simple random sample of 144 high school female students who were recruited from Al-Russafa High School for females in Baghdad City. The sample size was determined using the G*Power software based on an effect size of 0.25, an alpha error probability of 0.05, a power of 0.95, two groups, and three repetitions. Consequently, the recommended sample size is 142. The entire number of study participants is 144.

Measures: The study instrument consists of participants' sociodemographic characteristics of age, living arrangement, and family's socioeconomic status was determined based on the Revised Kuppuswamy and B G Prasad socio-economic scales for 2016 [(15)] which encompasses the parents' level of education which consists of 10 levels (10 points for each of the parents), the household's occupation which consists of seven levels; the seventh level takes 10 points, and the family's monthly income

which includes six categories; the highest or sixth category takes 10 points. Thus, the overall score would be 40. The score ranges between 34-40 is classified as upper class, the score ranges between 21-33 is classified as upper middle class, the score ranges between 15-20 is classified as lower middle class, the score ranges between 6-14 is classified as upper lower class, and the score of 5 or less is classified as lower class.

Stages of Change Scale: The study instrument also includes the Transtheoretical Model of Change measures of Stages of Change for Carbonated Drinks Consumption Behavior Scale (Short Form) which includes five questions, each question represents one of the Stages of Change for Carbonated Drinks Consumption.

It also includes Stages of Change for Carbonated Drinks Consumption Behavior Scale (Continuous Measure) which includes 23 items that are measured on a 5-point Likert scale of 1 for (Strongly disagree), 2 for (Disagree), 3 for (Undecided), 4 for (Agree), and 5 for (Strongly agree). The total score ranges between 23-115. A higher score indicates greater Stages of Change for Carbonated Drinks Consumption Behavior. The Stages of Change Carbonated Drinks Consumption Behavior Scale (Continuous Measure) exhibited excellent internal consistency reliability and content validity.

Processes of Change Scale: The Processes of Change for Carbonated Drinks Consumption Behavior Scale which includes 40 that are measured on a 5-point Likert scale of 1 for (never), 2 for (Scarcely), 3 for (sometimes), 4 for (mostly), and 5 for (Repeatedly). The total score ranges between 40 -200. A higher score indicates a greater Process of Change for Carbonated Drinks Consumption Behavior. Distributed onto the Experiential Processes of Change (3 items for Consciousness Raising), (3 items for Dramatic Relief), (3 items for Environmental Reevaluation), (3 items for the Self-Reevaluation), and (3 items for Social Liberation). For the Behavioral Processes of Change, there are (4 items for Counterconditioning), (7 items for Helping Relationships), (5 items for Reinforcement Management), (6 items for Self-Liberation), and (3 items for Stimulus Control). The Processes of Change for Carbonated Drinks Consumption Behavior Scale exhibited excellent internal consistency reliability and content validity.

Self-Efficacy Scale: The Self-Efficacy for Carbonated Drinks Consumption Behavior Scale which includes 18 items that are measured on a 5-point Likert Scale of 1 for (Not at all tempted), 2 for (Not very tempted), 3 for (Moderately tempted), 4 for (Very tempted), and 5 for (Extremely tempted). These items are distributed into the Habit Situations (4 items), Positive Affect Situations (4 items), Negative Affect Situations (5 items), and Social Cues (Social Situations) (5 items). The total score ranges between 18 -90, higher score indicates greater Self-Efficacy for refraining from Habit Situations (4 items). The Self-Efficacy for Carbonated Drinks Consumption Behavior Scale exhibited excellent internal consistency reliability and content validity.

Decisional Balance Scale: Decisional Balance Scale for Carbonated Drinks Consumption Behavior which includes 22 items that are measured on a 5-point Likert scale of 1 for (Not quite sure), 2 for (Somewhat confident), 3 for (Moderately confident), 4 for (very confident), and 5 for (Totally confident). The overall score ranges between 22-110, a lower score indicates a greater Decisional Balance for refraining. The Decisional Balance Scale for Screen Time exhibited excellent internal consistency reliability and content validity.A pilot study was carried out for the period from October 9th, 2022 to October 13th, 2022, and conducted with (10) students. A pilot sample is excluded from the study sample. The pilot study serves to verify the readability of items and the time required to answer the study instrument. The time required for answering it ranged between 40-45-minutes.An official request was submitted from the University of Baghdad / College of Nursing to the Directorate General of Education Baghdad Governorate, Al-Russafa-1,2,3.The student researcher obtained approval from the ethical committee in the College of Nursing at the University of Baghdad before conducting this study. The data were collected using a self-reported instrument for the period from October 16th, 2022, to October 20th, 2022.Data were analyzed using the statistical package for social science (SPSS) for Windows, version 26. The statistical measures of frequency, percent, mean, standard deviation, and linear regression were used.

RESULTS

Table 1: Participants' sociodemographic characteristics (N = 144)

Variable	Frequency	Percent
Age (Years)		*
15.00	20	13.9
16.00	47	32.6
17.00	34	23.6
18.00	32	22.2
19.00	11	7.6
Mean (SD): 16.8 ± 1.16		
Socioeconomic Class		
Upper lower class	20	13.9
Lower middle class	51	35.4
Upper middle class	71	49.3
Upper class	2	1.4

* Percent is not exactly 100.0%
SD: Standard deviation

The mean age is 16.8 ± 1.16; less than third age 16-years (n = 47; 32.6%), followed by those who age 17-years (n = 34; 23.6%), those who age 18-years (n = 32; 22.5%), those who age 15-years (n = 20; 13.9%), and those who age 19-years (n = 11; 7.6%).Concerning socioeconomic class, around half are classified as upper middle class (n = 71; 49.3%), followed by those whose who are of lower middle class (n = 51; 35.4%), those who are of upper lower class (n = 20; 13.9%), and those who are of upper class (n = 2; 1.4%).

Table 2: Participants' distribution according to Stages of Change

Stage of Change		
Precontemplation	84	58.3
Contemplation	28	19.5
Preparation	30	20.8
Action	0	0.0
Maintenance	2	1.4

More than half are in the Precontemplation Stage of Change (n = 84; 58.3%), followed by those who are in the Preparation Stage of Change (n = 30; 20.8%), those who are in the Contemplation Stage of Change (n = 28; 19.5%), and those who are in the Maintenance Stage of Change (n = 2; 1.4%).

Table 3: Stepwise regression for factors predicting Stages of Change

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	30.847	11.465		2.691	.008		
	Age	1.351	.649	.168	2.082	.039	.997	1.003
	Socioeconomic Status	.419	.141	.240	2.968	.004	.997	1.003
2	(Constant)	21.357	12.125		1.761	.081		
	Age	1.436	.674	.179	2.130	.035	.755	1.324
	Socioeconomic Status	.393	.134	.225	2.935	.004	.907	1.102
	Consciousness	.051	.332	.013	.153	.879	.750	1.334

	Dramatic Relief	-.102	.290	-.036	-.352	.726	.520	1.921
	Environmental Reevaluation	-.015	.328	-.005	-.045	.964	.506	1.975
	Self-Reevaluation	.008	.302	.003	.026	.979	.356	2.813
	Social Libeation	-.211	.298	-.063	-.708	.480	.678	1.476
	Counterconditioning	.421	.264	.152	1.593	.114	.584	1.712
	Helping Relationships	.136	.149	.082	.912	.363	.658	1.519
	Reinforcement Management	.309	.208	.144	1.486	.140	.566	1.768
	Self-Liberation	.421	.158	.296	2.664	.009	.432	2.317
	Stimulus Control	.201	.338	.050	.594	.554	.758	1.320
	SE Study Pretest	.287	.357	.352	.804	.423	.028	36.012
	Habitual Situation	-.148	.222	-.080	-.668	.505	.370	2.701
	Positive Affect	.755	.423	.420	1.786	.077	.096	10.384
	Negative Affect	.203	.355	.134	.571	.569	.096	10.403
	Social Cues	.100	.369	.051	.270	.788	.149	6.725
	Self-Efficacy	-.312	.302	-.862	-1.033	.304	.008	130.660
	Decisional Balance	-.022	.044	-.042	-.501	.617	.753	1.327

A Dependent Variable: Stages of Change
B Beta; Sig.: Significance; t: T-Statistics

The regression model displays that the family's socioeconomic status, Self-Liberation, and students' age positively predicted the Stages of Change to refrain from carbonated drinks (p-value = .004, .009, 035) respectively.

DISCUSSION

This study is a part of randomized controlled trial which aimed to identify high school female students' readiness to refrain from carbonated drinks. More than half were in the Precontemplation Stage of Change, in addition to around fifth who were in the Contemplation Stage of Change. These findings imply that most of the study participants never think about refraining from carbonated drinks consumption which reflects that they are uniformed of the deleterious consequences of carbonated drinks. These findings are consistent with these of [15-19] who reported that over half of the adolescents (55%) were classified into one of the pre-action stages (i.e., Precontemplation or Contemplation). The regression model displayed that the family's socioeconomic status, Self-Liberation, and students' age positively predicted the Stages of Change to refrain from carbonated drinks. This finding implies that the better the family's socioeconomic status, the greater the readiness to refrain from carbonated drinks consumption[20].

CONCLUSION

The regression model displayed that Self-Liberation and students' age positively predicted the Stages of Change to refrain from carbonated drinks. This finding implies that .The regression model displayed that students' age positively predicted the Stages of Change to refrain from carbonated drinks.

REFERENCES

1 Ren JS, Freedman ND, Kamangar F, Dawsey SM, Hollenbeck AR, Schatzkin A, et al. Tea, coffee, carbonated soft drinks and upper gastrointestinal tract cancer risk in a large United States prospective cohort study. European Journal of Cancer [Internet]. 2010 Jul [cited 2023 Aug 8];46(10):1873–81.

2 Cuomo R, Andreozzi P, Zito FP. Alcoholic beverages and carbonated soft drinks: consumption and gastrointestinal cancer risks. Cancer treatment and research [Internet]. 2014 [cited 2023 Aug 8];159:97–120.

3 Malik VS, Popkin BM, Bray GA, Després J-P, Hu FB. Sugar-sweetened beverages, obesity, type 2 diabetes mellitus, and cardiovascular disease risk. Circulation [Internet]. 2010 Mar 23 [cited 2023 Aug 8];121(11):1356–64.

4 Hatch EE, Wise LA, Mikkelsen EM, Christensen T, Riis AH, Sørensen HT, et al. Caffeinated Beverage and Soda Consumption and Time to Pregnancy. Epidemiology. 2012 May;23(3):393–401.

5 Khalifa M. Effect of obesity and socioeconomic status on adolescents' high school students' intelligence quotient in Baghdad City. Iraqi National Journal of Nursing Specialties [Internet]. 2017;30(1):9–14. Available from: http://dx.doi.org/10.58897/injns.v30i1.262

6 Tan D, Wang Y, Lo CY, Sang S, Ho CT. Methylglyoxal: Its Presence in Beverages and Potential Scavengers. Annals of the New York Academy of Sciences. 2008 Apr 1;1126(1):72–5.

7 Sports drinks and energy drinks for children and adolescents: are they appropriate? Pediatrics [Internet]. 2011 Jun [cited 2023 Aug 8];127(6):1182–9.

8 Özen AE, Bibiloni MDM, Pons A, Tur JA. Fluid intake from beverages across age groups: a systematic review. Journal of human nutrition and dietetics: The official journal of the British Dietetic Association [Internet]. 2015 Oct [cited 2023 Aug 8];28(5):417–42.

9 Tireki S. A review on packed non-alcoholic beverages: Ingredients, production, trends and future opportunities for functional product development. Trends in Food Science & Technology. 2021 Jun;112:442–54.

10 Asala Riyadh, Suhad Hikmat. Effectiveness of Education Program on Secondary Schools Students Knowledge about Dysmenorrhea in Alnasiriya City Schools. Iraqi National Journal of Nursing Specialties. 2018 Dec 30;31(2):33–42.

11 Healthy diet [Internet]. Available from: https://cdn.who.int/media/docs/default-source/healthy-diet/healthy-diet-fact-sheet-394.pdf?sfvrsn=69f1f9a1_2&download=true

12 Talib Abrar, Hala Abdulwahd. Impact of Factors upon Children' Weight Status of age one to Five years old at Primary Health Care Centers in AL Samawah City. Iraqi National Journal of Nursing Specialties. 2019 Jun 30;32(1):69–78.

13 Denehy J. The Health Effects of Soft Drinks. The Journal of School Nursing. 2003 Apr;19(2):63–4.

14 Jawad F. Effectiveness of the Health Action Process Approach on promoting the health behaviors of male high school students in Al-rusafa district. Iraqi National Journal of Nursing Specialties [Internet]. 2022;35(1):58–69. Available from: http://dx.doi.org/10.58897/injns.v35i1.620

15 Hadi TH, Abd Ali MB. Collegians' Readiness to Consume Vegetables: The Transtheoretical Model of Change as a Theoretical Framework. NVEO-NATURAL VOLATILES & ESSENTIAL OILS Journal| NVEO. 2021 Nov 15:5406-14.

16 Abd Ali MB. Using the Transtheoretical Model of Change to Understand Collegians' Whole Grains Consumption. Kufa Journal for Nursing Sciences. 2023 Apr 11;13(1):46-54

17 Hamzah ZM, Abd Ali MB. Using the Constructs of the Transtheoretical Model of Change in Enhancing Regular Physical Exercise for Female High School Students. SCOPUS IJPHRD CITATION SCORE. 2018 Dec;9(12):960

18 Taher AK, Younis NM.Assessment the Effect of a Trans theoretical Model in Improving Behaviors Health Care workers related Electronic Hookah in Mosul City /Iraq. Rawal Medical Journal: 2023 Jan. Vol. 48, (1):228-.

19 Kokaz SH, Abd Ali MB. Factors Determining Collegians' Readiness To Adopt Cholesterol-Lowering Behaviors: The Transtheoretical Model Of Change As A Theoretical Framework. NVEO-NATURAL VOLATILES & ESSENTIAL OILS Journal| NVEO. 2021:28-47.

20 Shaikh Z, Pathak R. Revised Kuppuswamy and B G Prasad socio-economic scales for 2016. International Journal of Community Medicine And Public Health [Internet]. 2017 Mar 28 [cited 2018 Dec 28];4(4):997. Available from: https://www.ijcmph.com/index.php/ijcmph/article/viewFile/1242/1005