

Collegians' Readiness to Consume Vegetables: The Transtheoretical Model of Change as a Theoretical Framework

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Abstract

Study Design: A descriptive predictive design was used to guide this study.

Setting: The study was conducted in Al-Qadisiyah University.

Sample: The study included a convenience sample of 400 undergraduate students.

Study Instrument: The study instrument includes sociodemographic sheet. It also includes Stages of Change Scale for The Stages of Change Scale for Vegetables Consumption, The Decisional Balance Scale for Vegetables Consumption, The Self-Efficacy Scale for Vegetables Consumption.

Data Collection: Data were collected using an online google form for the period from March 5th, 2021 to April 22nd, 2021.

Data Analyses: Data were analyzed using the statistical package for social science, version 26.

Study Results: The study results revealed that around a half were in the Contemplation Stage of Change for consuming grains, followed by those who are in the Preparation Stage of Change, and those who are in the Maintenance Stage of Change. Furthermore, around a half were in the Contemplation Stage of Change for consuming fruits ($n = 198$; 49.5%), followed by those who are in the Preparation Stage of Change ($n = 111$; 27.75%), and those who are in the Maintenance Stage of Change ($n = 91$; 22.75%).

Conclusion: The better the family's socioeconomic status, the greater the Pros of consuming vegetables vice versa. The higher the Stages of Change for consuming vegetables regularly, the greater the values of Pros of consuming vegetables regularly.

Keywords: The Transtheoretical Model of Change; Vegetables Consumption

Introduction

People's health is greatly influenced by the foods and beverages that they consume. Scholars for many decades have well documented the link between food and health in that they demonstrated that people can achieve and maintain good health and minimize the risk for chronic disease across all phases of the lifespan through adopting healthy dietary patterns (U.S. Department of Agriculture [USDA], 2020).

Vegetables (F & V) are a vital part of healthy human diet (Epuru et al., 2014). Vegetables are considered a high source of both macro (fats, proteins, carbohydrates) and micronutrients (vitamins and minerals), and more recently phytochemicals, especially antioxidants that individually, or in combination, benefit health (Bellows, 2012; Hill & Höfer, 2019; Mann, 2007; Slavin & Lloyd, 2012).

It is indicated that a high intake of vegetables raises macronutrient, carbohydrate, and fiber intakes, and likely to reduce fat intake, with no overall impact on energy intake (Fulton et al., 2017). One of the top ten risk factors for the deathrate is low vegetable consumption up to 1.7 million lives saved per year with sufficient consumption of vegetables at the global level (Katagiri et al., 2021; World Health Organization, 2005).

Vegetables are undeniably essential elements of a well-balanced and nutritious diet. However, their global intake is very poor (Bvenura & Sivakumar, 2017). Poor consumption of vegetables leads to unbalanced and

dangerous diets, which have been associated with a range of diseases and conditions, as well as higher mortality rates in the worst-case situation (Aune et al., 2017).

While habits of healthy eating are an important component of living a healthier lifestyle (Romas & Sharma, 2017), bad dietary patterns have long been linked to the development of chronic diseases (Olivares et al., 2017). Better curing is an early prevention and one way to do so is to raise awareness by educating (Jalali Farahani et al., 2014).

Chronic diseases such as cardiovascular disease (CVD), hypertension, obesity, stroke, osteoporosis, diabetes, as well as cancer like breast cancer, colorectal cancer, bladder cancer, and lung cancer (Farvid et al., 2019; Lee et al., 2017; Vieira et al., 2015; Wang et al., 2015) with high all-cause mortality, are global health issues that are source death and disability millions of people (Anderson & Durstine, 2019). Vegetable have been shown to have a positive role against the occurrence of these chronic diseases (Aune et al., 2017; Boeing et al., 2012; Mellendick et al., 2018; Munshi et al., 2015). The reason that vegetables play a preventive role from diseases are due to the presence of phytochemicals that act as antioxidants (Khalifa, 2020).

Approximately three-quarters of the students consume a few vegetables in their daily diet, while the rest of the students consume the recommended daily amount (Al-Otaibi, 2013). Thus, the risks of weight gain and the development of food-related chronic diseases can be reduced by encouraging students to eat healthy food during their adult life (Raymond & Morrow, 2021).

To lead a healthier life in the future and remove unhealthy behavior from the lifestyle, models of behavioral change and correct education must be used to achieve this.

The study aims to (1) identify students' Stages of Change for consuming vegetables, (2) identify the association between students' age, body mass index (BMI), family's socioeconomic status, and Decisional Balance for consuming of vegetables, and (3) investigate the difference in students' Decisional Balance for consumption of vegetables and Self-Efficacy for consumption of vegetables between the groups of gender, grade, social class, living arrangement, and Stages of Change for consuming vegetables.

Materials and Methods

Study Design

A descriptive predictive design will be used to guide this study.

Setting:

The study was carried out at Al-Qadisiyah University. The study subjects were recruited from 10 colleges in this university which College of Medicine, College of Dentistry, College of Veterinary Medicine, College of Pharmacy, College of Nursing, College of Administration and Economics, College of Science, College of Sports, College of Law, College of Education.

Sample and Sampling: A non-probability convenience sample of (400) students who are enrolled in the aforementioned colleges based on a margin of error of 5%, confidence level of 95%, a population size of 18,000, and response distribution of 50%, the recommended sample size is 377, the final size is 400.

Measures: The study instrument is composed of three parts and these parts are: Students

Sociodemographic Sheet: This part includes the variables of (age, gender, grade, living arrangement, marital status, residency, level of education, household socioeconomic status which encompasses parents' level of education, a household's occupation, and family's monthly income). The study instrument includes also subjects' body mass index (BMI) which is calculated by dividing the body weight in kilogram by the body

height in meter multiplied. The resultant number of less than 18.5 is considered as underweight, the number ranges between 18.5-24.9 is considered within normal weight-to-height proportion, the number ranges between 25-29.9 is considered as overweight, the number ranges between 30-34.9 is considered as obesity class I, the number ranges between 35-39.9, the number of 40 or above is considered as obesity class III (Raymond & Morrow, 2021).

The Stages of Change Scale A discrete specification of the criterion behavior for sufficient consumption is included in this scale (a discrete definition of consuming vegetables). The staging tool's items evaluated the reported level of current intake for each food (vegetables), as well as consistency and duration of consumption at a reported level, which was designed (Maina, 1999). The researcher used the Arabic version (Abd Ali, n.d.). The Pros (10 items) and Cons (10 items) highlighted respondents' perceptions of barriers and benefits important in their decision to increase consumption of vegetables products. These items were measured using a on a five-point Likert type scale ranging from one for (not important at all) to five for (very important).

Data Collection: Data were collected from the period from March 6th 2021, to April 10th 2021.

Data Analyses: The data was analyzed by using IBM statistical package for social sciences (SPSS) for Windows, version 26, Chicago, IL.

Results and Discussion

The mean of age is 22.79 ± 3.19 ; most age 18-24-years ($n = 309$; 77.25%), followed by those whose age 25-30-years ($n = 79$; 19.75%), and those whose age 31-36-years ($n = 12$; 3.0%).

Concerning the gender, the most are females ($n = 276$; 69.0%) compared to males ($n = 124$; 31.0%).

Regarding marital status, the majority are not married ($n = 333$; 83.25%, followed by those who are married ($n = 61$; 15.25%), those who are widow/widower ($n = 4$; 1.0%), and those who are divorced ($n = 2$; 0.05%).

With respect to grade, more than a quarter are fourth graders ($n = 105$; 26.25%), followed by those who are third graders ($n = 94$; 23.5%), those who are first graders ($n = 77$; 19.25%), those who are fifth graders ($n = 40$; 10.0%), and those who are sixth graders ($n = 20$; 5.0%).

Concerning the living arrangement, most reported that they have been living with parents ($n = 300$; 75.0%), followed by those who live in dormitory ($n = 44$; 11.0%), those who have been living with mother ($n = 43$; 10.75%), those who have been living with father ($n = 9$; 2.25%), and those who both have been living with relatives and friends ($n = 2$; 0.5%) for each of them.

Regarding residency, most reported that they have been living in urban areas ($n = 254$; 63.5%), followed by those who have been living in suburban areas ($n = 90$; 22.5%), and those who have been living in rural areas ($n = 56$; 14.0%).

With respect to family's socioeconomic status, the socioeconomic status for more than a third is of lower middle class ($n = 143$; 35.75%), followed by those who are of upper middle class ($n = 137$; 34.25%), those who are of upper lower class ($n = 98$; 24.5%), those who are of upper class ($n = 18$; 4.5%), and those who are of lower class ($n = 4$; 1.0%).

Table 1. Participants' sociodemographic characteristics (N = 400)

Variable	Frequency	Percent
Age (Years): Mean (SD) = 22.79 ± 3.19		
18-24	309	77.25
25-30	79	19.75
31-36	12	3.0
Gender		
Male	124	31.0
Female	276	69.0
Marital Status		
Not married	333	83.25
Married	61	15.25
Divorced	2	0.5
Widow/Widower	4	1.0
Grade		
First	77	19.25
Second	64	16.0
Third	94	23.5
Fourth	105	26.25
Fifth	40	10.0
Sixth	20	5.0
Living Arrangement		
Live with parents	300	75.0
Live with my mother	43	10.75
Live with my father	9	2.25
Live with my relatives	2	0.5
Live with my friends	2	0.5
Dormitory	44	11.0
Residency		
Urban	254	63.5
Rural	56	14.0
Suburban	90	22.5
Socioeconomic status		
Lower class	4	1.0
Upper lower class	98	24.5
Lower middle class	143	35.75
Upper middle class	137	34.25
Upper class	18	4.5

Less than a half are in the Contemplation Stage of Change for consuming vegetables (The person is considering making a change in the next six months or less) ($n = 181$; 45.3%), followed by those who are in the Preparation Stage of Change (The person resolves to change and makes arrangements to do so, generally within a month. the person may have previously tried to change in the recent past) ($n = 122$; 30.5%), and those who are in the Maintenance Stage of Change (The person has kept the new habit for six months or longer and it has become a part of his or her everyday routine) ($n = 97$; 24.3%).

Table 2. Participants' distribution according to their readiness to consume vegetables

Stages of Change	Frequency	Percent
Contemplation	181	45.3
Preparation	122	30.5
Maintenance	97	24.3

There is statistically significant association between participants' body mass index and their Decisional Balance for consumption of vegetables (p -value = .030).

Table 3. Associations among study between participants' age, socioeconomic status, body mass index and their Decisional Balance for consumption of vegetables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Age	-.110	.184	-.031	-.595	.552
SES	.052	.079	.033	.660	.509
BMI	.352	.161	.112	2.182	.030

This descriptive predictive study aimed mainly to determine students' Stages of Change for consuming vegetables. The study findings revealed that less than a half are in the Contemplation Stage of Change for consuming vegetables, followed by those who are in the Preparation Stage of Change, and those who are in the Maintenance Stage of Change. This finding is consistent with that reported by Robson et al. (dos Reis et al., 2014) who stated that the majority of subjects in the Hispanic community (55%) reported being in the Precontemplation/Contemplation Stage while the majority of subjects in the African American community (60%) reported being in the Preparation Stage of Change. On the other hand, this finding is inconsistent with that obtained by Reis et al., (Hildebrand & Betts, 2009) who stated that most of the subjects were in the Preparation Stage of Change, followed by those who were in the Precontemplation/Contemplation Stages of Change.

This finding is higher than that reported by Hildebrand and Betts (Lindstöm et al., 2001) who reported that 43% of the subjects were in Precontemplation/Contemplation Stages of Change ($n = 102$), 29% were in the Preparation ($n = 69$), and 28% were in the Action/Maintenance Stages of Change ($n = 67$).

Reis et al., (2014) noted that most of the undergraduate students in the Action/Maintenance Stages had an adequate consumption of fruit and vegetables.

There was a statistically significant positive association between participants' family's socioeconomic status and Pros of consuming vegetables. This finding could be explained as that family whose socioeconomic status is better would consider the greater value of consuming vegetables. Contrarily, families whose socioeconomic status is poor would find it difficult to consume vegetables regularly. Lindstöm et al., (2001) concluded that there were socioeconomic-wise statistically significant differences in consumption of vegetables and fruit juices in that the odd ratio (OR) for low vegetable consumption among men with low social participation was 1.8 compared to women (OR of 2.1). They also concluded that the socioeconomic status gradients in vegetable consumption remained significant for both sexes throughout the multivariate analyses.

There was a statistically significant inverse association between participants' body mass index and their Decisional Balance for consumption of vegetables. This finding implies that the greater the BMI, the lower the values of Decisional Balance for consumption of vegetables. In other words, students who are overweight or obese consider neither the benefits (Pros) of regular consumption of vegetables nor the costs (Cons) of not consuming them.

There was a statistically significant difference in participants' Pros of consuming vegetables between gender groups. Further descriptive statistics reveal that the value of Pros of consuming vegetables was greater among females than males. This finding could be explained as females could consume vegetables more than males since they take more care of themselves as they may believe that vegetables can improve their health, particularly epidermal health.

There is a need by the Iraqi Ministry of Planning to establish plans that improve the population's socioeconomic status which in turn enable them to consume vegetables regularly. There is a need by the community health nurses; in collaboration with the Iraqi Ministry of Health and Mass Media, to initiate health education materials that raise the health awareness of individuals who are both overweight and obese about the vital role of consuming vegetables regularly. Further, studies that target individuals with lower Stages of Change for consuming vegetables regularly are required. There is a need to incorporate materials that highlight the vital role of consuming vegetables regularly into the curricula of various educational levels in Iraq.

Conclusion

The researcher concluded the following:

The better the family's socioeconomic status, the greater the perceived value of consuming vegetable. The better the family's socioeconomic status, the greater the Pros of consuming vegetables vice versa. The higher the Stages of Change for consuming vegetables regularly, the greater the values of Pros of consuming vegetables regularly.

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

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