

Factors Determining Collegians' Readiness To Adopt Cholesterol-Lowering Behaviors: 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 and sampling: The study included a convenience sample of 400 undergraduate students.

Study Instrument: The study instrument includes students' sociodemographic sheet of age, gender, marital status, and grade. It also includes The Stages of Behavior Change for Physical Activity, The Confidence in Refraining from Eating High Fat Foods in Different Situations Scale, The Confidence in Persisting with Exercise in Different Situations Scale, The Pros and Cons of a Low-Fat Diet Scale, and The Pros and Cons of Physical Activity.

Data collection: Collection: Data were collected using an online google form for the period from February 8th, 2021 to April 24nd, 2021.

Data analysis: Data were analyzed using the statistical package for social science, version 26. The descriptive statistical measures of frequency, percent, mean, and standard deviation were used to describe subjects' socio-demographic characteristics. The inferential statistical measures of linear regression, Independent-Sample T-Test, and One-Way Analysis of Variance.

Study Results: The study results revealed that less than a third is in the Action SOC for low-fat food. Less than a third was in the Contemplation SOC for regular physical exercise. There was statistically significant difference in Self-Efficacy for Refraining from high-fat food in different situations among the Stages of Change for Regular Physical Exercise groups. There was statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for Regular Physical Exercise groups. There was a statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups. There was a statistically significant difference in Self-Efficacy for refraining from high-fat food in different situations among the Stages of Change for choosing low-fat food groups. There was a statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for choosing low-fat food groups.

Conclusions: The researcher concluded the following:

- The lower the Stages of Change for choosing a low-fat diet, the lower the Processes of Behavior Change for choosing a low-fat diet.
- The Lower the Stages of Change for choosing a low-fat food, the lesser the use of the Processes of Behavior Change for choosing a low-fat food.
- The higher Stages of Change for choosing low-fat food, the greater Self-Efficacy for refraining from high-fat food in different situations.
- The higher the Stages of Change for choosing low-fat food, the greater the use of Processes of Behavior Change for choosing a low-fat food.

Recommendations:

There is a need to establish health promotion activities based on the TTM that aim to enhance students' Self-Efficacy for continuing exercises in different situations and choosing low-fat food in different situations.

Introduction:

Non-communicable diseases refers to diseases or ailments that influence people over a long period of time and for which there are no known causative agents are transmitted from one individual to another⁽¹⁾.

NCDs, chronic diseases often known as long-term illnesses, are due to a combination of genetic, physiologic, environmental, and behavioral variables. (World Health Organization,2021). Four main types of NCDs are cardiovascular diseases, cancer, hyperglycemia, and chronic respiratory illnesses. also, few other NCDs Parkinson's disease, heart disease, strokes, autoimmune diseases, chronic kidney disease osteoarthritis, osteoporosis, and Alzheimer's disease⁽²⁾.

Every year,(41-million) individuals die as a result of NCD accounting for 71% of all deaths worldwide. Annually, more than 15-million individuals who age 30-69 years die as a result of NCD, 85% of these mortalities happen in countries with low- and middle-income. Cardiovascular diseases account for most NCD deaths, or 17.9 million people annually, followed by cancers (9.3 million) respiratory diseases (4.1 million), and diabetes (1.5 million).These four groups of diseases account for over 80% of all premature NCD deaths.⁽³⁾.

Methodology:

A descriptive predictive design was used to guide this studyand conducted in Al-Qadisiyah University.

The study included a convenience sample of 400 undergraduate students. The instrument of study includes students' socio-demographic sheet of age, gender, marital status, and grade. It also includes The Stages of Behavior Change for Physical Activity, The Confidence in Refraining from Eating High Fat Foods in Different Situations Scale, The Confidence in Persisting with Exercise in Different Situations Scale, The Pros and Cons o f a Low-Fat Diet Scale, and The Pros and Cons of Physical Activity.

Data were collected using an online google form for the period from February8th, 2021 to April 24nd, 2021.

Data were analyzed using the statistical package for social science, version 26. The descriptive statistical measures of frequency, percent, mean, and standard deviation were used to describe subjects' socio-demographic characteristics. The inferential statistical measures of linear regression, Independent-Sample T-Test, and One-Way Analysis of Variance.

Results:

Table (1) Participants' socio-demographic characteristics (N = 400)

Variable	Frequency	Percent
Age (Years): Mean (SD) = 23.05 ± 3.52		
18-22	220	55.0
23-27	127	31.75
28-32	53	13.25
Gender		
Male	124	31.0
Female	276	69.0
Grade		
First	92	23.0
Second	96	24.0
Third	60	15.0
Fourth	135	33.75
Fifth	14	3.5
Sixth	3	0.75
Living Arrangement		
Live with parents	312	78.0
Live with my mother	36	9.0
Live with my father	8	2.0
Live with my relatives	3	.75
Other	41	10.25
Marital Status		
Not married	320	80.0
Married	71	17.75
Divorced	9	2.25

Continued...

Variable	Frequency	Percent
Residency		
Urban	265	66.25
Suburban	98	24.5
Rural	37	9.25
Socioeconomic Class		
Lower class	5	1.25
Upper lower class	141	35.25
Lower middle class	173	43.25
Upper middle class	79	19.75
Upper class	2	0.5

The age mean is 23.05 and the standard deviation is 3.52; more than a half age 18-22-years (n = 220; 55.0%), followed by those who age 23-27-years (n = 127; 31.75%), and those who age 28-32-years (n = 53; 13.25%).

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

Concerning the marital status, the majority are not married (n = 320; 80.0%), followed by those who are married (n = 71; 17.75%), and those who are divorced (n = 9; 2.25%).

Regarding grade, around a third are fourth graders (n = 135; 33.75%), followed by those who are second graders (n = 96; 24.0%), those who are first graders (n = 92; 23.0%), those who are third graders (n = 60; 15.0%), those who are fifth graders (n = 14; 3.5%), and those who are sixth graders (n = 3; 0.75%).

With respect to the living arrangement, most reported that they have been living with their parents (n = 312; 78.0%), followed by those who have other living arrangement (n = 41; 10.25%), those who have been living with their mother (n = 36; 9.0%), those who have been living with their father (n = 8; 2.0%), and those who have been living with their relatives (n = 3; 0.75%).

Regarding the residency, most reported that they have been living in urban areas (n = 265; 66.25%), followed by those who have been living in suburban areas (n = 98; 24.5%), and those who have been living in rural areas (n = 37; 9.25%).

Concerning the socioeconomic class, more than two-fifth are of lower middle class (n = 173; 43.25%), followed by those who are of the upper lower class (n = 141; 35.25%), those who are of the upper middle class (n = 79; 19.75%), those who are of the lower class (n = 5; 1.25%), and those who are of the upper class (n = 2; 0.5%).

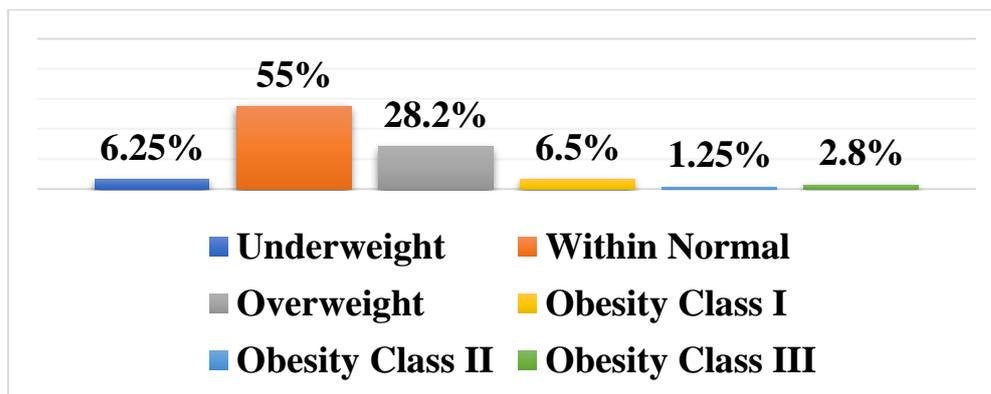


Figure1. Participants' distribution according to BMI

More than a half are within normal weight-to-height proportion (n = 220; 55.0%), followed by those who are overweight (n = 113; 28.2%), those who have obesity class I (n = 26; 6.5%), those who underweight (n = 25; 6.25%), those who have obesity class III (n = 11; 2.8%), and those who have obesity class II (n = 5; 1.25%).

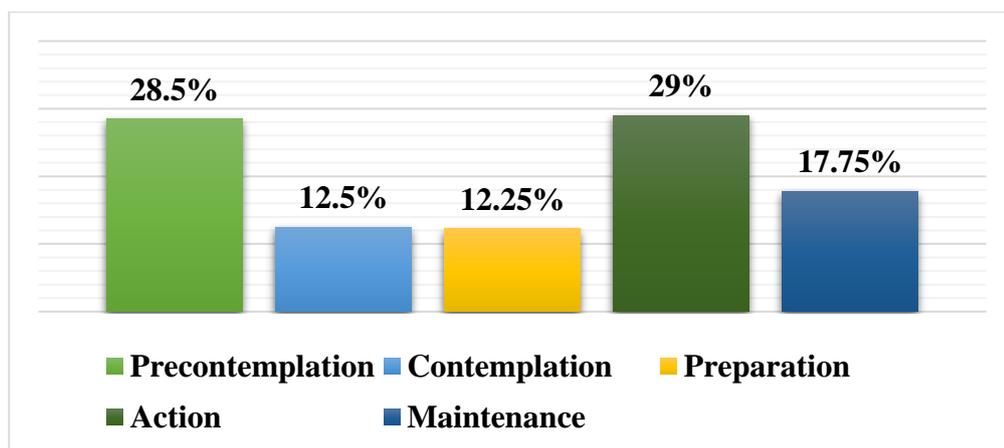


Figure2. Participants’ distribution according to Stages of Change for low-fat food

Less than a third are in the Action SOC for low-fat food (n = 116; 29.0%), followed by those who are in the Precontemplation SOC (n = 114; 28.5%), those who are in the Maintenance SOC (n = 71; 17.75%), those who are in the Contemplation SOC (n = 50; 12.5%), and those who are in the Preparation SOC (n = 49; 12.25%).

Table 2. Association between participants’ age, socioeconomic status, body mass index and their Self-Efficacy for refraining from high-fat food in different situations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	-.228	.137	-.085	-1.661	.098
SES	-.047	.085	-.028	-.554	.580
BMI	.094	.051	.094	1.837	.067

There is no statistically significant association between participants’ age, socioeconomic status, body mass index and their Self-Efficacy for refraining from high-fat food in different situations.

Table3. Association between participants’ age, socioeconomic status, body mass index and their Pros of choosing low-fat food in different situations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	-.006	.053	-.006	-.121	.904
SES	-.096	.033	-.146	-2.927	.004
BMI	-.001	.020	-.002	-.034	.973

There is a statistically significant inverse association between family’s socioeconomic status and students’ Pros of choosing low-fat food in different situations (p-value = 0.04).

Table4. Association between participants’ age, socioeconomic status, body mass index and their Cons of choosing low-fat food in different situations.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	.181	.051	.180	3.550	.000
SES	-.047	.032	-.073	-1.481	.139
BMI	-.010	.019	-.027	-.525	.600

There is a statistically significant positive association between students' age and their Cons of choosing low-fat food in different situations (p-value = 0.00)

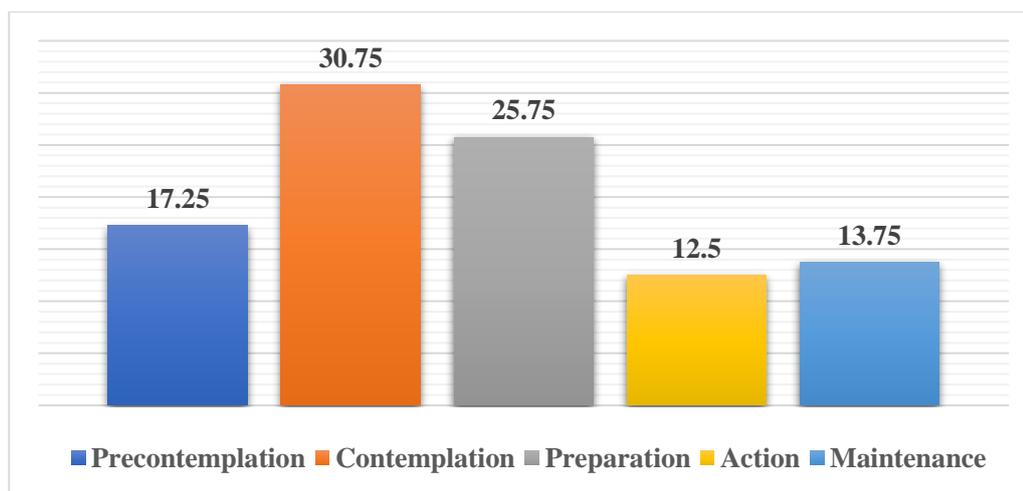


Figure3. Participants' distribution according to Stages of Change for regular physical exercise

Less than a third are in the Contemplation SOC for regular physical exercise (n= 123; 30.75%), followed by those who are in the Preparation SOC (n = 103; 25.75%), those who are in the Precontemplation SOC (n = 69; 17.25%), those who are in the Maintenance SOC (n = 55; 13.75%), and those who are in the Action SOC (n = 50; 12.5%).

Table 5. Association between participants' age, socioeconomic status, body mass index and their Self-Efficacy for continuing exercises in different situations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	-.190	.065	-.148	-2.915	.004
SES	-.078	.040	-.095	-1.921	.056
BMI	.033	.024	.069	1.364	.173

There is a statistically significant inverse association between participants' age and their Self-Efficacy for continuing exercises in different situations (r = -.004).

Table6. Association between participants' age, socioeconomic status, body mass index and their Pros adopting physical activity

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	.008	.164	.002	.047	.963
SES	.012	.102	.006	.113	.910
BMI	.051	.061	.043	.833	.405

There is no statistically significant association between participants' age, socioeconomic status, body mass index and their Pros of adopting physical activity in different situations.

Table7. Association between participants' age, socioeconomic status, body mass index and their Cons adopting physical activity

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	.062	.071	.045	.869	.385
SES	-.019	.044	-.022	-.430	.667
BMI	.027	.027	.053	1.033	.302

There is statistically significant association between participants' age, socioeconomic status, body mass index and their Cons of adopting physical activity in different situations.

Table 8. Association between participants' age, socioeconomic status, body mass index and their Processes of Behavior Change for adopting physical activity

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	-.360	.498	-.037	-.723	.470
SES	.020	.309	.003	.066	.947
BMI	.049	.187	.014	.263	.793

There is no statistically significant association between participants' age, socioeconomic status, body mass index and their Processes of Behavior Change for adopting physical activity in different situations.

Table 9. Association between participants' age, socioeconomic status, body mass index and their Decisional Balance of choosing a low-fat diet

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	.174	.086	.103	2.023	.044
SES	-.143	.054	-.132	-2.666	.008
BMI	-.011	.032	-.017	-.331	.741

There is a statistically significant positive association between participants' age and their Decisional Balance of choosing a low-fat Diet ($r = .044$). On the other hand, there is statistically significant inverse association between participants' socioeconomic status and their Decisional Balance of choosing a low-fat diet ($r = -.08$).

Table 10. Association between participants' age, socioeconomic status, body mass index and their Processes of Behavior Change for choosing a low-fat diet

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Age	1.187	.388	.155	3.056	.002
SES	.110	.241	.023	.454	.650
BMI	.099	.146	.035	.681	.496

There is a statistically significant positive association between participants' age and their Processes of Behavior Change for choosing a low-fat diet ($r = .01$).

Table 11. Differences in Self-Efficacy for continuing exercises in different situations, Pros and Cons of adopting physical activity, and Processes of Behavior Change for adopting physical activity between the groups of gender

Independent Samples Test										
Gender		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Self-Efficacy for Continuing Exercises in Different Situations	Equal variances assumed	2.024	.156	-1.744	398	.082	-.85063	.48785	-1.80971	.10845
	Equal variances not assumed			-1.684	218.515	.094	-.85063	.50517	-1.84626	.14500
Pros and Cons of Adopting Physical Activity	Equal variances assumed	.288	.592	-.193	398	.847	-.29137	1.50956	-3.25908	2.67633
	Equal variances not assumed			-.195	241.594	.846	-.29137	1.49741	-3.24103	2.65828
Processes of Behavior Change for Adopting Physical Activity	Equal variances assumed	1.175	.279	-1.020	398	.308	-3.76087	3.68658	-11.00847	3.48673
	Equal variances not assumed			-.991	221.530	.323	-3.76087	3.79449	-11.23878	3.71704

There is a statistically significant difference in Self-Efficacy for continuing exercises in different situations, Pros and Cons of adopting physical activity, and Processes of Behavior Change for adopting physical activity between the groups of gender ($p = 0.002$)

Table 12. Differences in Self-Efficacy for Refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet between the groups of gender

Independent Samples Test										
Gender		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Self-Efficacy for refraining from high-fat food	Equal variances assumed	.844	.359	-2.076	398	.039	-2.10951	1.01630	-4.10750	-.11152
	Equal variances not assumed			-2.039	227.121	.043	-2.10951	1.03477	-4.14850	-.07053
Pros and Cons of choosing a low-fat diet	Equal variances assumed	.973	.324	-.118	398	.906	-.07655	.64807	-1.35062	1.19751
	Equal variances not assumed			-.115	223.532	.908	-.07655	.66442	-1.38588	1.23277
Processes of Behavior Change for choosing a low-fat diet	Equal variances assumed	.681	.410	-.831	398	.406	-2.42345	2.91515	-8.15445	3.30756
	Equal variances not assumed			-.815	226.160	.416	-2.42345	2.97357	-8.28289	3.43600

There is a statistically significant difference in Self-Efficacy for Refraining from high-fat food in different situations between the groups of gender ($p = 0.05$).

Table 13. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the grade groups

ANOVA						
Grade		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food	Between Groups	1130.551	5	226.110	2.588	.026
	Within Groups	34422.347	394	87.366		
	Total	35552.898	399			
Self-Efficacy for Continuing Exercises in Different Situations	Between Groups	229.165	5	45.833	2.275	.047
	Within Groups	7937.225	394	20.145		
	Total	8166.390	399			
Pros of Choosing a Low-Fat Food	Between Groups	29.589	5	5.918	.441	.820
	Within Groups	5289.921	394	13.426		
	Total	5319.510	399			
Cons of Choosing a Low-Fat Food	Between Groups	107.786	5	21.557	1.724	.128
	Within Groups	4926.311	394	12.503		
	Total	5034.098	399			
Pros of Adopting Physical Activity	Between Groups	2148.825	5	429.765	3.522	.004
	Within Groups	48080.135	394	122.031		
	Total	50228.960	399			
Cons of Adopting Physical Activity	Between Groups	101.006	5	20.201	.850	.515
	Within Groups	9361.371	394	23.760		
	Total	9462.377	399			
Processes of Behavior Change for Choosing a Low-fat Diet	Between Groups	4993.404	5	998.681	1.381	.230
	Within Groups	284893.034	394	723.079		
	Total	289886.438	399			
Processes of Behavior Change for Adopting Physical Activity	Between Groups	7803.391	5	1560.678	1.348	.243
	Within Groups	456214.999	394	1157.906		
	Total	464018.390	399			

There are statistically significant differences in participants' Self-Efficacy for Refraining from High-Fat Food, Self-Efficacy for Continuing Exercises in Different Situations, and Pros of Adopting Physical Activity among the grade groups ($p = 0.026, 0.047, 0.004$) respectively.

Table 14. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups.

ANOVA						
Living arrangement		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Continuing Exercises in Different Situations	Between Groups	27.661	4	6.915	.336	.854
	Within Groups	8138.729	395	20.604		
	Total	8166.390	399			
Pros and Cons of Adopting Physical Activity	Between Groups	386.561	4	96.640	.494	.740
	Within Groups	77219.416	395	195.492		
	Total	77605.978	399			
Processes of Behavior Change for Adopting Physical Activity	Between Groups	6573.905	4	1643.476	1.419	.227
	Within Groups	457444.485	395	1158.087		
	Total	464018.390	399			

There is no statistically significant difference in Self-Efficacy for Refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups

Table 15. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the marital status groups

ANOVA						
Marital status		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Continuing Exercises in Different Situations	Between Groups	71.598	2	35.799	1.756	.174
	Within Groups	8094.792	397	20.390		
	Total	8166.390	399			
Pros and Cons of Adopting Physical Activity	Between Groups	39.660	2	19.830	.101	.904
	Within Groups	77566.318	397	195.381		
	Total	77605.978	399			
Processes of Behavior Change for Adopting Physical Activity	Between Groups	2760.779	2	1380.390	1.188	.306
	Within Groups	461257.611	397	1161.858		
	Total	464018.390	399			

There is no statistically significant difference in Self-Efficacy for Refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the marital status groups.

Table 16. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of continuing exercise in different situations among the residency groups

ANOVA						
Residency		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Continuing Exercises in Different Situations	Between Groups	3.547	2	1.774	.086	.917
	Within Groups	8162.843	397	20.561		

Situations	Total	8166.390	399			
Pros and Cons of Adopting Physical Activity	Between Groups	39.195	2	19.597	.100	.905
	Within Groups	77566.783	397	195.382		
	Total	77605.978	399			
Processes of Behavior Change for Adopting Physical Activity	Between Groups	1522.406	2	761.203	.653	.521
	Within Groups	462495.984	397	1164.977		
	Total	464018.390	399			

There is no statistically significant difference in Self-Efficacy for continuing physical exercise in different situations, Pros and Cons for continuing physical exercise in different situations, and Processes of Behavior Change for continuing physical exercise in different situations among the residency groups.

Table 17. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for Regular Physical Exercise

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Continuing Exercises in Different Situations	Between Groups	337.825	4	84.456	4.261	.002
	Within Groups	7828.565	395	19.819		
	Total	8166.390	399			
Pros and Cons of Adopting Physical Activity	Between Groups	4805.589	4	1201.397	6.519	.000
	Within Groups	72800.388	395	184.305		
	Total	77605.978	399			
Processes of Behavior Change for Adopting Physical Activity	Between Groups	29187.635	4	7296.909	6.629	.000
	Within Groups	434830.755	395	1100.837		
	Total	464018.390	399			

There are statistically significant differences in Self-Efficacy for Refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for Regular Physical Exercise groups ($p = 0.002, 0.000, 0.000$) respectively.

Table 18. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the grade groups

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food in Different Situations	Between Groups	1130.551	5	226.110	2.588	.026
	Within Groups	34422.347	394	87.366		
	Total	35552.898	399			
Pros and Cons of Choosing a	Between Groups	112.565	5	22.513	.625	.681

Low-fat Diet	Within Groups	14189.872	394	36.015		
	Total	14302.437	399			
Processes of Behavior Change for Choosing a Low-fat Diet	Between Groups	4993.404	5	998.681	1.381	.230
	Within Groups	284893.034	394	723.079		
	Total	289886.438	399			

There is statistically significant difference in Self-Efficacy for refraining from high-fat food in different situations among the grade groups ($p = 0.026$).

Table 19. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food in Different Situations	Between Groups	91.801	4	22.950	.256	.906
	Within Groups	35461.097	395	89.775		
	Total	35552.898	399			
Pros and Cons of Choosing a Low-fat Diet	Between Groups	167.370	4	41.842	1.169	.324
	Within Groups	14135.068	395	35.785		
	Total	14302.437	399			
Processes of Behavior Change for Choosing a Low-fat Diet	Between Groups	8089.165	4	2022.291	2.835	.024
	Within Groups	281797.273	395	713.411		
	Total	289886.437	399			

There is statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups ($p = 0.024$).

Table 20. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the marital status groups

ANOVA						
		Sum of Squares	Df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food in Different Situations	Between Groups	302.159	2	151.079	1.701	.184
	Within Groups	35250.739	397	88.793		
	Total	35552.898	399			
Pros and Cons of Choosing a Low-fat Diet	Between Groups	121.627	2	60.813	1.703	.184
	Within Groups	14180.811	397	35.720		
	Total	14302.438	399			
Processes of Behavior Change for Choosing a Low-	Between Groups	5678.951	2	2839.475	3.966	.020
	Within Groups	284207.487	397	715.888		

fat Diet	Total	289886.438	399			
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There is statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the marital status groups ($p = 0.020$).

Table 21. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the residency groups

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food in Different Situations	Between Groups	13.970	2	6.985	.078	.925
	Within Groups	35538.928	397	89.519		
	Total	35552.897	399			
Pros and Cons of Choosing a Low-fat Diet	Between Groups	64.226	2	32.113	.895	.409
	Within Groups	14238.211	397	35.865		
	Total	14302.437	399			
Processes of Behavior Change for Choosing a Low-fat Diet	Between Groups	1122.352	2	561.176	.772	.463
	Within Groups	288764.086	397	727.365		
	Total	289886.437	399			

There is statistically significant difference in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the residency groups.

Table 22. Differences in Self-Efficacy for refraining from high-fat food in different situations, Pros and Cons of choosing a low-fat diet, and Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for choosing low-fat food groups.

ANOVA						
		Sum of Squares	df	Mean Square	F	Sig.
Self-Efficacy for Refraining from High-Fat Food in Different Situations	Between Groups	2553.524	4	638.381	7.641	.000
	Within Groups	32999.373	395	83.543		
	Total	35552.898	399			
Pros and Cons of Choosing a Low-fat Diet	Between Groups	193.884	4	48.471	1.357	.248
	Within Groups	14108.553	395	35.718		
	Total	14302.438	399			
Processes of Behavior Change for Choosing a Low-fat Diet	Between Groups	24746.476	4	6186.619	9.217	.000
	Within Groups	265139.961	395	671.240		
	Total	289886.438	399			

There are statistically significant differences in Self-Efficacy for refraining from high-fat food in different situations and Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for choosing low-fat food groups ($p = 0.000, 0.000$) respectively.

Discussion:

This descriptive predictive study aimed mainly to identify students' readiness to adopt cholesterol-lowering behaviors.

Less than a third are in the Action SOC for low-fat food ($n = 116; 29.0\%$), followed by those who are in the Precontemplation SOC ($n = 114; 28.5\%$), those who are in the Maintenance SOC ($n = 71; 17.75\%$), those who are in the Contemplation SOC ($n = 50; 12.5\%$), and those who are in the Preparation SOC ($n = 49; 12.25\%$). According to the Trans-theoretical Model of Change, this finding implies that more than a half of the study subjects were in lower Stages of Change for low-fat food. This reflects that they do not intend to change their unhealthy behavior (high-fat diet consumption)

The researcher believes that no single factor can shape individuals' dietary behavior. In other words, there are many factors that can shape such a behavior. The planned behaviour theory postulates three intention determinants, each of which has an indirect influence on society through an effect on intention. The first is the attitude toward the behaviour, which relates to the degree of evaluation or appraisal of an individual in terms of the behaviour in question, ranging from favourable to unfavourable

The subjective norm, which relates to the perceived social pressure to perform or not perform the activity, is the second predictor⁽⁴⁾. To put it another way, subjective norms are a person's ideas on whether or not significant others (i.e., people whose opinions on a person's behaviour in this area are important to her or him) should engage in the behaviour⁽⁵⁾.

The measurement of perceived behavioural control, which refers to the perceived ease or difficulty of doing the task, is the third factor of intention.

It is expected to represent prior experience as well as predicted obstructions and challenges. ⁽⁴⁾. Perceived behavioural control can influence behaviour indirectly through intentions, and it can also be used to predict behaviour directly. ⁽⁶⁾. as a general rule, the more favourable an individual's attitude, subjective norm, and perceived behavioural control are toward an activity, the stronger the individual's intention to engage in the conduct in question. ⁽⁴⁾.

According to the notion of dual processes, ⁽⁷⁾. To form their attitudes and behaviours, people use both a cognitive (logical) and an affective (emotional) system. As a result, depending just on cognitive variables to predict behaviour may not be sufficient. The affective system has been shown to operate faster and give output earlier than the cognitive system. ⁽⁸⁾, Non-cognitive variables can't be overlooked when it comes to forecasting behaviour.⁽⁹⁾. Many academics agree that emotions influence intention and conduct in this regard. ^(10, 11)

Less than a third were in the Contemplation SOC for regular physical exercise, followed by those who were in the Preparation SOC, those who were in the Precontemplation SOC, those who were in the Maintenance SOC, and those who were in the Action SOC. According to the Trans-theoretical Model of Change, study subjects do not engage in regular physical exercise. Further cross-tabulation analysis demonstrates that the majority of subjects who were in the lower Stages of Change for regular physical exercise were female students

This finding is inconsistent with that of Sorensen and Gill (2008) who reported that Individuals who define themselves as physically active but not on a regular basis made up the largest group for both genders and for all age groups in the Preparation Stage of Change.

There was a statistically significant inverse association between participants' age and their Self-Efficacy for continuing exercises in different situations. This finding implies that the younger the students, the greater the Self-Efficacy for continuing exercises in different situations. This finding could be explained as that when individuals get older, their physical functioning declines which manifests younger students to enjoy greater Self-Efficacy for continuing exercises in different situations.

There was a statistically significant inverse association between family's socioeconomic status and students' Pros of choosing low-fat food in different situations. This finding implies that the poorer the family's socioeconomic status, the greater the Pros of choosing low-fat food in different situations. This finding could be explained as those families whose socioeconomic status is poor may be unable to shop high-fat foods which could be expensive.

There was a statistically significant positive association between students' age and their Cons of choosing low-fat food in different situations. This finding implies that as students get older, their likelihood of experiencing challenges in of choosing low-fat food in different situations would be greater.

There was no statistically significant association between participants' age, socioeconomic status, body mass index and their Self-Efficacy for refraining from high-fat food in different situations. This finding could be explained in the context of the Health Belief Model which mainly premises that individuals' likelihood of adopting a healthy behavior including refraining from high-fat food in different situations would be less when they believe that their chance of contracting a disease or health condition is poor. Since study subjects are young, so they may sensitize that they are healthy and the chance of their contracting health conditions or disease(s) including hypercholesterolemia is poor. As such, they are very unlikely to adopt cholesterol-lowering behaviors; particularly refraining from high-fat diet.

There was a statistically significant positive association between participants' age and their Decisional Balance of choosing a low-fat food. This finding could be explained as that study subjects could realize that when they get older, their chance of contracting cardiovascular disease will be greater as a result of hypercholesterolemia owing to not adhering to low-fat diet.

On the other hand, there was a statistically significant inverse association between family's socioeconomic status and their Decisional Balance of choosing a low-fat diet. This finding could be explained as those families whose socioeconomic status is better may live; to some extent, a luxurious life where they could be used to a dietary pattern characterized of high-fat foods including red meat which could originate hypercholesterolemia.

There was a statistically significant positive association between participants' age and their Processes of Behavior Change for choosing a low-fat food. This finding could be explained as that the older the individuals, the more the daily life experience that they go through. That is, as individuals get older, they may see individuals who have been used to consume high-fat diet which could contribute to one or more chronic disease including hypercholesterolemia or individuals who have been used to consume low-fat diet and as a result they can live without such diseases.

There was statistically significant difference in Self-Efficacy for continuing exercises in different situations between the groups of gender. Further cross-tabulation demonstrate that the proportion of female students is greater in the lower Stages of Change for continuing exercises in different situations than male students, On the other hand, the proportion of male students in the higher Stages of Change continuing exercises in different situations is greater than that of female students. This finding could be explained as females could encounter greater barriers to continue exercises in different situations including the Social Norms where the Iraqi society almost finds it difficult for the female to practice physical exercise

outside home. Other barriers include lack of facilities designed for practicing physical exercise for female in the community, being occupied with household tasks, and child rearing.

There was statistically significant difference in Pros of adopting physical activity for adopting physical activity between the groups of gender. Further descriptive statistics demonstrate that the value of the Pros of adopting physical activity is greater in female students than male students. This finding could be explained as female students may believe that engaging in regular physical exercise give them the cardiovascular fitness, the optimal body image they seek, improving epidermal health, and improving mood.

There was statistically significant difference in Processes of Behavior Change for adopting physical activity between the groups of gender.

Further descriptive statistics demonstrate that the value of the Processes of Behavior Change for adopting physical activity is greater in female students than male students. This finding could be explained as female students get through females who have been engaged in regular physical exercise which may brought them cardiovascular fitness, the optimal body image they seek, improving epidermal health, and improving mood. On the other hand, they may get through females who have been physically inactive or sedentary where these two conditions could bring them one or more chronic disease or health conditions including hypercholesterolemia.

There was a statistically significant difference in Self-Efficacy for refraining from high-fat food in different situations between the groups of gender. Further descriptive statistics demonstrate that the value of the Self-Efficacy for refraining from high-fat food in different situations was greater in female students than in male ones. This finding could be explained as that females care more about maintaining optimal body image, evading the exposure to chronic disease owing to consuming high-fat diet.

There were statistically significant differences in participants' Self-Efficacy for continuing exercises in different situations among the grade groups. Further post hoc analysis displays that the higher the grade, the greater value of the Self-Efficacy for continuing exercises in different situations.

There were statistically significant differences in participants' Pros of Adopting Physical Activity among the grade groups. Further post hoc analysis displays that the lower the grade, the greater value of the Pros of adopting physical activity. This finding could be explained as that the health awareness of adopting physical activity among students in lower grades is poorer compared to students in higher grades. There was statistically significant difference in Self-Efficacy for Refraining from high-fat food in different situations among the Stages of Change for Regular Physical Exercise groups. Further post hoc analysis displays that the Self-Efficacy for Refraining from high-fat food in different situations is poorer among sixth graders. This finding could be explained as that these students have very limited time which enables them to consume healthy food. That is, being occupied with a plenty of academic tasks render them seek fast food. Another explanation is that these students could consider consuming high-fat food a feature of luxurious life.

There was statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for Regular Physical Exercise groups. Further post hoc analysis exhibits that the value of Processes of Behavior Change for choosing a low-fat diet is lower among subjects in the Precontemplation Stage of Change for choosing a low-fat food.

There was a statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the living arrangement groups. Further post hoc analysis exhibits that the students who reported that they live with their mothers use more Processes of Behavior Change for choosing a low-fat diet. This finding could be explained as those students who live with their mothers are more cared for by their mothers in that mothers seek to pay more attention to the food they prepare.

There was statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the marital status groups. Further post hoc analysis exhibits that married students use more in Processes of Behavior Change for choosing a low-fat diet compared to divorce and not married students. This finding could be explained as married students care more for themselves owing to their feeling of assuming their own responsibility and their family responsibility. That is, they may believe that choosing a low-fat diet can maintain them healthy.

There was a statistically significant difference in Self-Efficacy for refraining from high-fat food in different situations among the Stages of Change for choosing low-fat food groups. Further post hoc analysis demonstrates that students in higher Stages of Change for choosing low-fat food enjoy greater Self-Efficacy for refraining from high-fat food in different situations. The TTM postulates that individuals in higher Stages of Change enjoy better Self-Efficacy for adopting a healthy behavior.

There was a statistically significant difference in Processes of Behavior Change for choosing a low-fat diet among the Stages of Change for choosing low-fat food groups. Further post hoc analysis reveals that students in higher Stages of Change use more Processes of Behavior Change for choosing a low-fat food than students in the lower Stages of Change for choosing low-fat food. The TTM postulates that individuals in higher Stages of Change use more enjoy Processes of Behavior Change for adopting a healthy behavior.

Study Limitations

This study involves a number of limitations including that the study sample is convenient sample this has an impact on the study's generalizability. Furthermore, the study sample is limited to a single city, limiting the generalization of the study.

Recommendations:

There is a need to establish health promotion activities based on the TTM that aim to enhance students' Self-Efficacy for continuing exercises in different situations and choosing low-fat food in different situations. There is a need to devote more health education activities for younger students that aim to improve their Decisional Balance of choosing a low-fat food. There is a pressing need to develop health promotion activities for female students that aims to enhance their readiness to engage in regular physical exercises in different situations. There is a need to activate the on-campus physical activity courses.

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