Effect of Lifestyle Modification on common risk factors of Non-Communicable Diseases (NCDs) among Overweight and Obese Medical Students in Faculty of Medicine, Zagazig University: A Pre-Post Interventional Study.

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ABSTRACT:

Background: University life is characterized by deterioration in health behaviors, such as poor eating habits and decreased physical activity, which may result in bad health outcomes in the form of Non-Communicable Diseases (NCDs). Lifestyle modification is the cornerstone for managing obesity and lipid and lipoprotein problems in primary and secondary preventive settings. **Objective:** To evaluate the effect of a lifestyle modification program on behavioral (diet and physical exercise) and metabolic risk factors (Blood pressure, hemoglobin A1C, and lipid profile) of NCDs in overweight and obese medical students. **Methods:** This is a pre-post interventional study on one hundred thirty students in the Faculty of Medicine, Zagazig University, assigned to an intervention group exposed to a lifestyle modification program and a control group. Blood pressure, hemoglobin A1C, and lipid profile were evaluated before and after the intervention. **Results:** There was a significant improvement in the intervention group regarding dietary balance, physical activity, BMI as12.3% of students acquired normal weight, and the percentage of obese students dropped from 16.9% to 13.9%, The rate of hypertensives decreased from 23% to 1.5%, and fasting lipid profile (dyslipidemia dropped from 40% to 7.7%) compared to controls. Binary logistic regression showed that the diastolic blood pressure percentage of change and the HDL-C percentage of change were the most significant factors associated with dietary percentage of change in the intervention group. **Conclusion:** Lifestyle modification is highly effective in reducing common risk factors of NCDs (overweight/obesity, elevated blood pressure, and dyslipidemia).

Keywords: College students, Diet, Physical activity, Lipid profile.

INTRODUCTION

University life stage is a special turning point between youth and maturity. This time marks a decline in healthy behaviors, such as reduced physical activity, unhealthy eating patterns, and the development of smoking

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habits. As a result, NCDs are predicted to result in negative health consequences. [2] A previous Egyptian study indicated that 12.5% of medical students were obese and 36.9% of students were overweight, which increases their risk of having NCDs.[2]

Worldwide, approximately 41 million deaths occur each year due to non-communicable diseases like cardiovascular diseases (CVD) and diabetes. Unhealthy diets were classified as the second leading risk factor for the worldwide burden of diseases in 2016, resulting in nearly 11 million deaths in 2017. Lack of physical activity was identified as one of the main contributors to worldwide deaths, accounting for more than 1.3 million fatalities globally. [3]

According to estimates, NCDs account for 67% of premature deaths and 82% of all fatalities in Egypt. In partnership with WHO, the Ministry of Health and Population performed the STEP-wise study in 2011–12, which found a notably elevated frequency of risk factors for noncommunicable diseases (NCDs) in the adult population. Approximately 75% of people do not engage in intense physical exercise, with 42% of women being obese and 66% overweight. [4]

Adoption of a healthy lifestyle can prevent more than 80% of NCDs. It can also allow patients to live a healthier, longer life with fewer chances for morbidity and better quality of life. The recommended lifestyle modifications include healthy eating patterns, a healthy weight, increasing physical activity, and smoking cessation. [5]

The main objective of this study was to evaluate the effect of a lifestyle modification program on behavioral (diet and physical exercise) and metabolic risk factors (Blood pressure, hemoglobin A1C, and lipid profile) of NCDs in overweight and obese medical students.

Methods:

Study design: This is a pre-post-interventional study involving two groups. The first group is the intervention group that is exposed to the lifestyle modification program (diet change and exercise). The second group is the control group that is not exposed to the intervention program.

Study setting: Students' education halls, Faculty of Medicine, Zagazig University, Egypt.

Study time: The study was carried out over 6 months from the first of November 2022 to the first of May 2023.

Study population: The study subjects were obese and overweight medical students from all grades. Students with dyslipidemia due to underlying medical conditions (endocrinal abnormality, known diabetes and hypertensive students) were excluded from the study to avoid confounders.

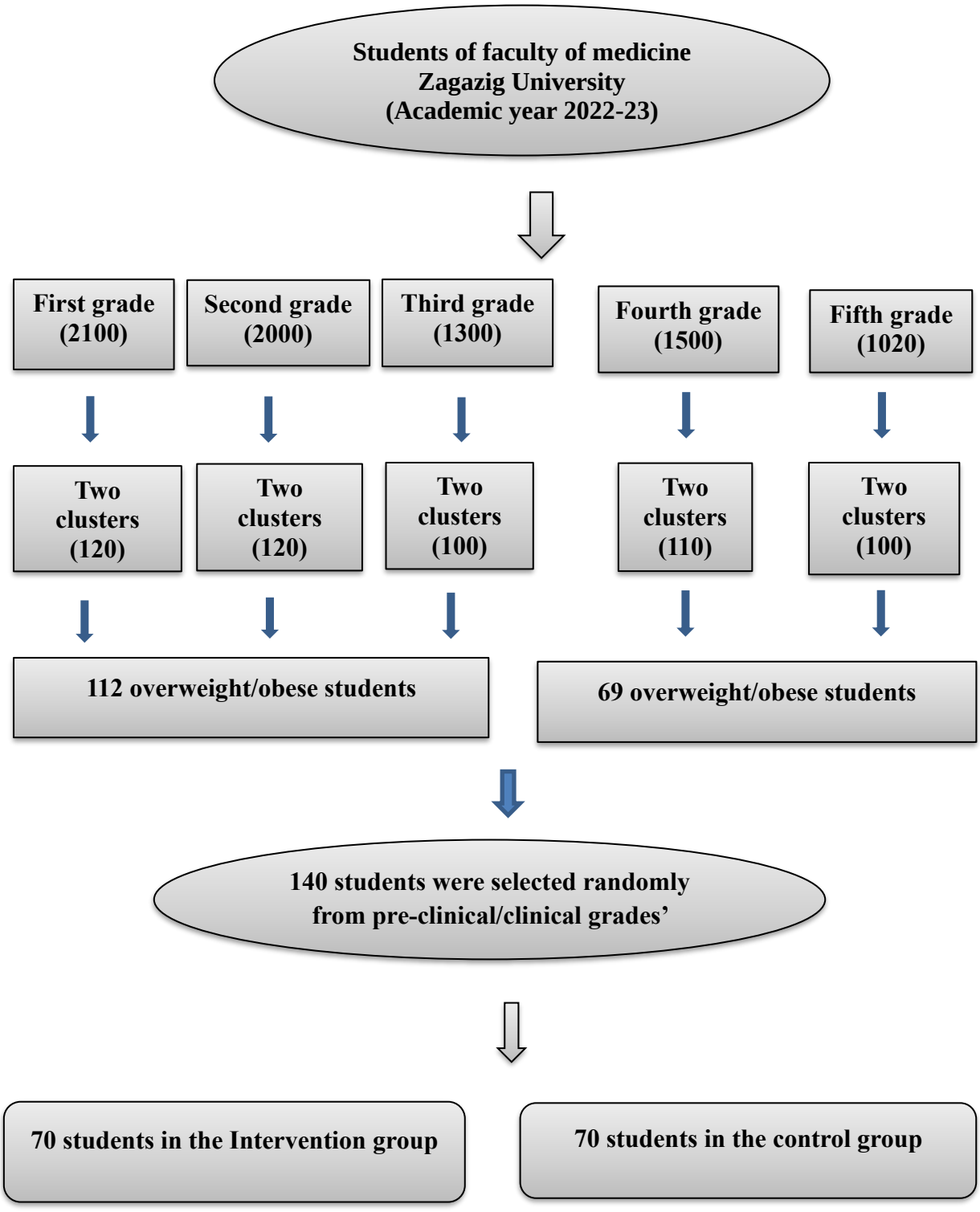

Figure 1: Flowchart of the Two-Stage Sampling Process

The sample size: It was calculated by computer software Open Epi info program, according to the following: the mean of daily serving of bread intake before and after

intervention is (0.76±0.06 VS 0.73±0.06) respectively according to Shahril *et al*. in 2013, (6) the power of the test is 80% at 95% CI. The estimated sample size is 126 participants; 10% of the sample size was added to compensate for the dropout rates. The total sample is 140 students.

The Sampling technique was in two stages: Stage 1: A stratified cluster random sampling was used; clusters were selected from each grade, all examined for weights and heights for body mass index (BMI) calculation. Overweight/ obese were identified, Stage 2: A stratified random sampling: Participants were stratified into (pre-clinical grades) and (clinical grades) with proportional allocation (3:2), 140 students were selected randomly and assigned to the intervention and control group by simple random technique (70) in each group**.**

Data collection tools:

- Personal history includes name, age, gender, and socioeconomic status scale (Fahmy *et al.,* 2015). It is both reliable (0.79) and valid. [7]
- The Food Frequency Questionnaire (FFQ): This tool evaluates the average amount (in servings) of different food entities consumed by the individual during the past year. The scores are categorized according to each food group's corresponding Recommended Daily Allowance (RDA). The individual is considered to have a balanced diet if the RDA is met from all the food groups. The questionnaire has high reliability (≥ 0.8). [8]
- The International Physical Activity Questionnaire (IPAQ) Arabic (Saudi Arabia) - Self Administered – Short Form: This tool assesses the intensity and duration of physical activity that individuals do daily to estimate the total physical activity in MET-min/week. [9]
- A stand-on scale with a height rod for measuring weight and height to calculate BMI and a sphygmomanometer for measuring blood pressure.
- Blood sample for: -fasting lipid profile: total cholesterol ≥ 200 mg/dl, HDL-cholesterol < 40 mg/dl, LDL- cholesterol ≥130 mg/dl and Triglycerides ≥150 mg/dl are considered dyslipidemia**,** **(10)** and -Glycosylated hemoglobin (Hb1c) for detection of impaired glucose tolerance (pre-diabetes) if A1c= 5.7- 6.4% according to the American Diabetic Association (ADA) 2022**.** **(11)**

- **The intervention:**

- A health education program about the common risk factors of non-communicable diseases and how to avoid these diseases through healthy lifestyle practices, including healthy eating habits, regular

physical activity, and maintaining a normal weight.

- A tailored diet regimen for each student to lose weight and detailed counselling guidance are provided according to the Non-communicable Disease Education Manual for Primary Health Care Professionals and Patients (NCD Education Manual). [12]

Fieldwork: **Three phases:**

1. Pre-intervention phase: Overweight and obese students were recruited to participate in the study for: Assessing their food consumption and dietary habits through FRQ, their physical activity through IPAQ – self-administered – short form. Blood pressure measurement and Blood testing for HbA1c and fasting lipid profile.
2. Intervention phase for 70 students: face-to-face communication, PowerPoint presentations, group discussions, individual and telephone counseling, and printed educational materials were used and continued for 6 months (one session monthly).
3. Post-intervention phase for 130 students (5 dropped out from each group): Reassessment after 6 months post-intervention by FRQ, BMI, Blood pressure, HbA1c, and fasting lipid profile.

Data management: The collected data were presented and analyzed statistically by computer using SPSS version 22. Pearson's Chi-Square Test was used to find the significant difference between the intervention and control groups, McNemar's Test to compare pre-post-intervention results in both groups regarding qualitative variables, and Wilcoxon Signed Ranks to compare pre-post-intervention results in both groups for qualitative data.

Percentage of change after the intervention in diet, physical activity, blood pressure, hemoglobin A1C, and lipid profile results was calculated for the intervention group according to the following equation: (post-intervention - pre-intervention results)/ pre-intervention result*100, Mann Whitney U Test was used to find the significant difference between the intervention, and control groups in non-parametric quantitative variables.

Ethical consideration:

The necessary official permission to carry out the study was obtained from family medicine department, faculty of medicine, Zagazig University. The study protocol was approved by the Institutional Review Board of the faculty (IRB#:6266-12-7).

An informed written consent was obtained from every student before filling

the questionnaires and for participation in the intervention. They were reassured about the strict confidentiality of any obtained information, and that the study results would be used only for the purpose of research. The study procedures were free from any harmful effects on the participants as well as the service provided.

Results:

The mean age of both groups was (20.99± 1.409) and (20.97± 1.340) in intervention and control groups respectively. 60% of the intervention group were females versus about 57% in the control group. About 71 % in the intervention group were high socioeconomic level versus 78.6% in the control group there was no statistically significant difference between groups regarding age, gender, and socio-economic level. (Table1).

After the application of the intervention program there was a high statistically significant difference in the intervention group in food group consumption regarding bread, cereals and sandwiches, sweets and snacks, drinks, and fat with a notable decrease in consumption.

Also, there was statistically significant difference in meat, and egg consumption that became lower, however, there was no statistically significant difference in dairy products, fruits, and vegetable consumption. Regarding the control group, there was a statistically significant difference in drinks and fruit consumption, which was slightly increased.

Both groups had a high statistically significant difference regarding consumption of bread, cereals, sweets, snacks, and fat after intervention, with better results in the intervention group. (Table 2).

The results showed that 100% of the intervention group after the program showed a balanced diet and sufficient physical activity, with a significant difference between pre-intervention and post-intervention.

There was no statistically significant change in the control group, but there was a high statistically significant difference between both groups as the intervention group adopted a more balanced diet with more sufficient physical activity (Table 3).

By assessing the BMI of students, the intervention group showed that 12.3% of students acquired a normal weight, and the percentage of obese students dropped from 16.9% to 13.9% after the intervention program.

At the same time, there was no difference in the control group regarding their body weights. Both groups had a statistically

significant difference regarding BMI, with post-intervention improvement in the intervention group (Table 4).

The results also showed that the change in blood pressure measurement interpretation post-intervention among the intervention group significantly improved (percentage of hypertensives decreased from 23% to 1.5%). Students with normal blood pressure increased to 70.8% compared to 27.7% in the control group, with a statistically significant difference. (Table 5).

The intervention group also showed a change in lipid profile results interpretation, improved after the intervention (dyslipidemia dropped from 40% to 7.7%), with a statistically significant difference between pre- and post-intervention.

A standard lipid profile was found among 92.3% of students in the intervention group compared to only 47.7% in the control group, with a statistically significant difference (Table 6).

The correlation between dietary percentage of change and the studied parameters showed a statistically significant negative correlation between dietary percentage of change and rate of change in diastolic blood pressure, HbA1c, and LDL-C. At the same time, there was a positive correlation between HDL-C and physical activity (Table 7).

The most significant factor associated with dietary percentage of change among intervention group was diastolic blood pressure and HDL-C percentage of change proved by logistic regression analysis (Table 8).

Discussion:

This study was conducted to assess the effect of lifestyle modification on some risk factors of NCDs. Regarding the dietary changes post-intervention, there was a high statistically significant difference in the intervention group in the consumption of bread, cereals & sandwiches, sweets & snacks, drinks, and fat being improved after the diet regimen.

However, there was no statistically significant difference among the control group toward consumption by different food groups, except for drinks and fruits, where there was a significant increase, which can be considered as more deterioration in dietary intake.

This was close to a previous systematic review which was conducted to assess the effectiveness of interventions targeting physical activity, nutrition, and maintaining healthy weight among university students revealing better nutritional outcome in the

intervention groups compared to control, [13] and similar to the Norwegian study of Helland, and Nordbotten, 2021 which found that Participants increased the consumption of healthy food and decreased unhealthy food at the 33-week post-intervention assessment. [14]

In concordance with the finding of significant post-intervention reduction in sweets consumption in the intervention group, a previous Saudi study also showed a significant reduction in added sugar intake in the intervention group. [15]

Conversely, the findings of the 10-week intervention program study conducted at the University of Louisville, USA, were inconsistent with the above results of this study, as they found no significant improvement in diet. [16]

A recent Chinese study found a significant improvement in dairy products, fruits, and vegetable intake in the intervention group's pre-post results, which is inconsistent with this study. [17]

This is probably because a small number of students did not prefer dairy products and refrained from consuming them, which remained the same post-intervention. This also explains the absence of statistically significant difference between the intervention and control groups post-intervention regarding meat & eggs, dairy products, fruits, and vegetables consumption.

This study revealed that 100% of students had sufficient physical activity post-intervention, while no statistically significant difference was found in the control group. This was matched with a Serbian study of medical students, which revealed that educational intervention significantly increased physical activity. [18]

Also, the Chinese study of Wang *et al.,* 2021 showed significant improvement in physical activity in the intervention group post-intervention, in consistence with the findings of this study. [17]

While the findings of the American study of Topp *et al* in 2011 were inconsistent with the results of the study at hand, they found a forty percent decrease in moderate physical activity among students. [16]

This may be attributed to the educational sessions in that American study that focused on the participants' cognitive structure (knowledge, attitudes, perceptions, and beliefs) and the participants' behavior regarding their physical activity rather than focusing on how to maintain a healthy lifestyle practically.

The post-intervention comparison between intervention and control groups regarding participants' BMI revealed a

significant improvement in the intervention group, which may be attributed to the tailored diet regimen for each participant, with close follow-up in the intervention group, encouraging them to do more physical activity.

This matches the study of Leiva *et al.* in 2015, conducted on university students in Chile, which found a significant decrease in body weight. [19] Also, the 12-month lifestyle intervention program, conducted by König *et al.* (2018 on obese patients in Germany, showed a significant reduction in BMI. [20]

Post-intervention comparison between intervention and control groups also revealed a significant improvement in the intervention group regarding blood pressure and lipid profile, but not for hemoglobin A1C, where there was no statistically significant difference.

The small number of students with abnormal results can explain this. This was in accordance with the study of Leiva *et al.* (2015, which found a significant decrease in blood pressure, total cholesterol, and triglycerides after intervention among university students. [19]

Also, a Chinese study reported a significant improvement in systolic and diastolic blood pressure post-intervention.[21] Another pilot study implemented a an intervention using mobile phones among American college students with elevated blood pressure to test its impact on blood pressure reduction found that there was significant decrease in blood pressure in the intervention group with no significant difference in the control group which is consistent with the results of this study regarding blood pressure measurement. [22]

Similarly, an American randomized controlled study by Gibbs *et al.* in 2014 showed significant improvement in HDL-C post-intervention. [23] Also, the South African study of Grace *et al.* (2021) found a significant decrease in LDL-C after physical activity and nutritional education intervention. [24]

In addition to the above studies and consistent with this study's results, the German study of König *et al.* in 2018 showed a significant reduction in systolic and diastolic blood pressure, total cholesterol, triglycerides, and Hb. A1C levels with 37.7% of the pre-diabetic patients studied no longer showed prediabetes criteria after the intervention and had normal HbA1C levels.

It also showed significant improvement in HDL-C. [20] This is matched with the two randomized controlled trials conducted in Japan on males with elevated blood pressure

(systolic ≥ 130 mmHg, and/or diastolic≥ 85 mmHg), and males with HbA1c ≥ 5.6 %, these studies revealed significant reduction in diastolic blood pressure, and HbA1c after dietary modification in the intervention groups compared to controls. [25]

And close to the findings of the systematic review and meta-analysis study of Ndanuko *et al.,* 2016, which found a significant reduction in blood pressure after adopting any healthy dietary pattern, such as the Mediterranean diet and the DASH diet (Dietary Approach to Stop Hypertension). [26]

This study revealed a highly statistically significant, strong positive correlation between the percentage of change in physical activity and the rate of change in HDL-C. This was consistent with the Spanish cohort study, which found that higher levels of physical activity were positively and linearly associated with levels of HDL-C over one year. [27]

Moreover, the systematic review and meta-analysis study of Palazón *et al.,* 2021 that revealed that all different types, and intensities of physical activity in different studies produced a significant improvement in HDL-C levels in the intervention group, ranging from 0.27 to 5.41 mg/dl, compared to the control group with no exercise. [28]

Additionally, the interventional study of Jesmin *et al.,* 2020, conducted among Bangladeshi women, showed that HDL-C was significantly improved with exercise. [29] This indicates the importance of physical activity in reaching the target improvement in HDL-C.

Limitations: Due to limited time and busy students' schedules, this has been overcome by prior scheduling of the appointment through contacting them using phones. Ten dropouts (five in each group) were present. However, 10% of the estimated sample size (14 students) were added from the start of the study to compensate for the expected dropouts.

Conclusion: Lifestyle modification is highly effective in reducing most of the risk factors of the common NCDs among overweight and obese students, affecting the direct outcomes (diet and physical activity) and the indirect outcomes (overweight/obesity, elevated blood pressure, and dyslipidemia).

Declarations:

Competing interest: All authors declare no conflicts of interest.

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Table (1): Comparison between the intervention and control groups regarding Demographic data:

Variable	Intervention group (n=70)		Control group(n=70)		P
	No	%	No	%	
Age Mean ± SD	20.99± 1.409		20.97±1.340		0.951 NS
Gender: Male Female	28 42	40 60	30 40	42.9 57.1	0.731 NS
Socio-economic level: Middle High	20 50	28.6 71.4	15 55	21.4 78.6	0.329 NS

Independent-Samples t Test for age, and Pearson Chi-Square Test for gender, and socioeconomic level.

Table (2): Comparison between pre-post-intervention results regarding food groups consumption in both groups:

Variable	Group	Pre-intervention (n= 65)		Post-intervention (n= 65)		p
		Median	Range	Median	Range	
Meat and egg	Intervention	20	10-79	18	10-35	P=0.012*
	Control	19	10-80	19	12-78	P= 0.143 NS
Comparing between both groups after intervention				P = 0.97 NS		
Bread, cereals, and sandwiches	Intervention	44	14-70	30	14-55	P=0.000**
	Control	39	12-86	40	12-85	P= 0.568 NS
Comparing between both groups after intervention				P= 0.000**		
Dairy products	Intervention	12	0-32	12	0-17	P= 0.712 NS
	Control	14	8-35	12	8-37	P= 0.364 NS
Comparing between both groups after intervention				P= 0.804		
Sweets, and snacks	Intervention	29	12-55	19	8-34	P=0.000**
	Control	23	10-90	23	10-89	P= 0.072 NS
Comparing between both groups after intervention				P= 0.000**		
drinks	Intervention	15	1-42	14	1-25	P=0.000**
	Control	15	7-54	16	7-52	P= 0.017*
Comparing between both groups after intervention				P= 0.013*		
fruits	Intervention	22	9-87	24	18-43	P= 0.103 NS
	Control	24	7-112	25	6-110	P=0.008**
Comparing between both groups after intervention				P= 0.305 NS		
vegetables	Intervention	35	7-80	35	21-75	P= 0.318 NS
	Control	29	7-112	29	6-110	P= 0.175 NS
Comparing between both groups after intervention				P= 0.379 NS		
Fat **(mean ±SD)**	Intervention	12.97±3.216		10.74±1.630		0.000**
	Control	12.89±2.593		12.78± 2.012		0.518 NS
Comparing between both groups after intervention				P= 0.000**		

Wilcoxon Signed Rank Test is used for all variables except Fat where independent-Sample t test was used. Mann-Whitney U Test to compare groups for all variables except for fat variable where Independent-Samples t Test was used.

** High statistically significant difference, * statistically significant difference

Table (3): Comparison between pre-post-intervention results regarding dietary balance and physical activity sufficiency in both groups:

Variable	Intervention group N-65 (%)		p	Control group N=65(%)		p
	Pre-intervention	Post-intervention		Pre-intervention	Post-intervention	
Diet Balanced unbalanced	 47(72.3) 18(27.7)	 65(100) 0 (0)	 0.000**	 48(73.8) 17(26.2)	 48(73.8) 17(26.2)	 1.00 NS
Comparing between both groups after intervention				P= 0.000**		
Physical activity Sufficient insufficient	 35 (53.8) 30(46.2)	 65(100) 0 (0)	 0.000**	 38(58.5) 27 (41.5)	 36(55.4) 29(44.6)	 0.500 NS
Comparing between both groups after intervention				P= 0.000**		

Test of significance is McNamar's test. Pearson Chi-Square Test for comparing both groups.

** High statistically significant difference.

Table (4): Comparison between pre-post-intervention regarding body mass index in both groups:

BMI	Group	Pre-intervention N=65		Post- intervention N=65		p
		No	%	No	%	
Normal	**Intervention**	0	0	8	12.3	**0.002****
Overweight		54	83.1	48	73.8	
obese		11	16.9	9	13.9	
Normal	**Control**	0	0	0	0	**1.000 NS**
Overweight		57	87.7	57	87.7	
obese		8	12.3	8	12.3	
Comparing between both groups after intervention				P= 0.012 *		

**High statistically significant difference.Test of significance is Wilcoxon Signed Rank Test .

Pearson Chi-Square test for comparing between intervention and control group.

Table (5): Comparison between pre-post-intervention results regarding blood pressure measurement interpretation in both groups:

Group	**Pre-intervention N=65(%)**			**Post- intervention N=65(%)**			p
	normal	High normal	hypertensive	normal	High normal	hypertensive	
intervention	25 (38.5)	25 (38.5)	15 (23)	46 (70.8)	18 (27.7)	1 (1.5)	0.000**
control	18 (27.7)	33 (50.8)	14 (21.5)	18 (27.7)	36 (55.4)	11 (16.9)	0.083 NS
Comparing between both groups after intervention				P= 0.000**			

** High statistically significant difference. Test of significance is Wilcoxon Signed Rank Test. Pearson Chi-Square Test between intervention and control group.

Table (6): Comparison between pre-post-intervention results regarding hemoglobin A1c and lipid profile results interpretation:

Variable	**Intervention group n=65(%)**		**p**	**Control group n=65(%)**		**p**
	Pre-intervention	Post-intervention		Pre-intervention	Post-intervention	
Lipid profile results interpretation Normal dyslipidemia	39 (60) 26 (40)	60 (92.3) 5 (7.7)	0.000**	35 (53.8) 30(46.2)	31(47.7) 34(52.3)	0.125 NS
Comparing between both groups after intervention				P= 0.000**		
Hb A1c results Normal prediabetes	63(96.9) 2 (3.1)	65 (100) 0 (0)	0.50 NS	62(95.4) 3 (4.6)	62(95.4) 3 (4.6)	1.00 NS
Comparing between both groups after intervention				P= 0.080 NS		

Test of significance is McNamar's test. ** High statistically significant difference. Pearson Chi-Square Test between intervention and control group.

Table (7): Spearman correlation between dietary percentage of change and other parameters in the intervention group:

Variable (Percentage of change)	**Correlation coefficient (r)**	**P**
Physical activity	0.380	0.002**
Systolic blood pressure	-0.210	0.092 NS
Diastolic blood pressure	-0.259	0.037*
HbA1c	-0.306	0.013*
Total cholesterol	-0.152	0.225 NS
HDL-C	0.305	0.013*
LDL-C	-0.319	0.010**
Triglycerides	-0.134	0.289 NS

* Statistically significant correlation, ** High statistically significant correlation.

Table (8): Binary logistic regression analysis for the significant factors associated with dietary percentage of change among the intervention group:

Variable	**B**	**S.E.**	**Wald**	**P**	**OR**	**95.0%**	**C.I.**
Physical activity percentage of change	-0.001	0.001	2.088	0.149	0.999	0.997	1.000
Diastolic blood pressure percentage of change	-0.203	0.070	8.495	0.004**	0.816	0.712	0.936
HbA1c percentage of change	-0.176	0.135	1.688	0.194	0.839	0.644	1.093
HDL-C percentage of change	0.172	0.065	6.908	0.009**	1.187	1.045	1.349
LDL-C percentage of change	0.016	0.071	0.048	0.826	1.016	0.883	1.168

OR: Odds Ratio. C.I: Confidence interval ** High statistically significant

الملخص العربي

تأثير تعديل نمط الحياة على عوامل الخطر الشائعة للأمراض غير المعديه (NCDs) بين طلاب الطب الذين يعانون من زيادة الوزن والسمنة: دراسة تدخلية قبليه بعديه.

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المقدمه: تتميز الحياة الجامعية بتدهور السلوكيات الصحية ، مثل عادات الأكل السيئة وانخفاض النشاط البدني مما قد يؤدي إلى نتائج صحية سيئة في شكل أمراض غير معديه (NCDs). يعد تعديل نمط الحياة حجر الزاوية لتحسين مشاكل السمنة والدهون. في جميع أنحاء العالم ، تحدث ما يقرب من ٤١ مليون حالة وفاة كل عام بسبب الأمراض غير المعدية مثل أمراض القلب والأوعية الدموية (CVD) والسكري. وقد تم تصنيف الأنظمة الغذائية غير الصحية على أنها عامل الخطر الرئيسي الثاني لعبء الأمراض في جميع أنحاء العالم كما صنف قلة النشاط البدني كأحد المساهمين الرئيسيين في الوفيات في جميع أنحاء العالم . **الهدف من الدراسه:** تقييم تأثير برنامج تعديل نمط الحياة (النظام الغذائي الصحي وممارسه الرياضه) على عوامل الخطورة : العوامل السلوكية والعوامل الأيضية (ارتفاع ضغط الدم و اضطراب الدهون و مقدمات مرض السكري) للأمراض غير المعديه بين طلاب الطب الذين يعانون من زيادة الوزن والسمنة في جامعة الزقازيق . **الطريقه:** أجريت دراسة تداخلية قبليه بعديه ذات ذراعين على مدى ٦ اشهر من أول نوفمبر ٢٠٢٢ إلى نهاية أكتوبر ٢٠٢٣، وقد مرت بالمراحل التالية:

١- مرحلة ما قبل البرنامج: (لجميع المشاركين (١٤٠) في مجموعات صغيرة): أجريت مقابلات مع المشاركين وجها لوجه لتقييم عاداتهم الغذائية، ونشاطهم البدني. كما تم تقييم مؤشر كتلة الجسم، وضغط الدم، ونسبة الهيموجلوبين السكري، ومستوى دهون الدم الصائم.

٢- مرحلة البرنامج: (لمجموعة التدخل فقط(70)): استمرت لمدة ستة أشهر (جلسة واحدة شهريا: تم إجراء الجلستين الأولى والرابعة وجها لوجه بشكل فردي، أو في مجموعات (٣-٥ طلاب / مجموعة)) واستغرقت حوالي ٢٠ دقيقة،

٣- مرحلة ما بعد البرنامج: (لجميع المشاركين): تمت إعادة التقييم بعد ستة أشهر من التدخل لـ (١٣٠) طالبًا.

النتائج : كان هناك تحسن ملحوظ في مجموعة التدخل فيما يتعلق بالتوازن الغذائي، والنشاط البدني، ومؤشر كتلة الجسم حيث حصل ١٢,٣٪ من الطلاب على وزن طبيعي وانخفضت نسبة الطلاب البدينين من ١٦,٩٪ إلى ١٣,٩٪، كما انخفضت نسبة المصابين بارتفاع ضغط الدم من ٢٣٪ إلى ١,٥٪، وانخفضت نسبة الدهون في الدم الصائم (انخفضت اضطرابات الدهون من ٤٠٪ إلى ٧,٧٪) مقارنة بالمجموعة الضابطة. أظهر الانحدار اللوجستي الثنائي أن نسبة التغير في ضغط الدم ونسبة التغير في HDL-C كانت العوامل الأكثر أهمية المرتبطة بنسبة التغير الغذائي في مجموعة التدخل. **الاستنتاج:** يعد تعديل نمط الحياة فعالا للغاية في الحد من معظم عوامل الخطر للأمراض غير المعديه الشائعة بين الطلاب الذين يعانون من زيادة الوزن والسمنة (زيادة الوزن / السمنة وارتفاع ضغط الدم واضطراب الدهون).