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Program for Prevention Non - Communicable Diseases according to Sustainable Development Egyptian Strategy 2030 among Female University Students at Benha City

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Abstract **Background:** Non- Communicable Diseases (NCDs) are one of the biggest public health challenges of the 21st century. The social and economic impacts of NCDs are threatening progress towards sustainable development. **The aim of this study** was to evaluate the effect of program for prevention non- communicable diseases according to sustainable development Egyptian strategy 2030 among female University Students at Benha City. **Research design**: Quasi-experimental research design was used in this study. **Setting**: The study was conducted at the female University Town at Benha City. **Sample**: A simple random sample of female University students, the total sample was (100). **Tools**: One tool was used. Part I): A structured interviewing questionnaire which consisted of three parts to assess socio-demographic characteristics, female University students` knowledge about non-communicable disease according to sustainable development healthy strategy 2030, and lifestyle reported practices among female University students for prevention of non-communicable disease, part II): Scale to measure attitude of the female University students for the non-communicable disease. **Results**: 54% of studied female University students their aged was 20 and more years, and 96% of them didn`t have frequency of disease, there were improvement in the studied female University students knowledge scores regarding non-communicable disease according to sustainable development healthy strategy 2030 after program implementation ($P < 0.001$). 37% of the studied female University students had satisfactory life style reported practices before program, and increased to 84% during the post program. 55% of studied female university students had negative attitude regarding NCDs before program, while this percentage decreased to 35 % post program. Also there was a positive statistically significant correlation between University students `total knowledge scores and female University students `total lifestyle reported practices and attitude scores before and post phases of the program. **This study concluded that**: The program succeeded to increase knowledge and improve lifestyle reported practices and change attitude of University students regarding prevention of non- communicable diseases according to sustainable development Egyptian Strategy 2030. **The study recommended that**: Continuous program for prevention NCDs among University students to increase their knowledge and practices. These programs should focus on the importance of practicing healthy life styles in this young age to prevent the occurrence of NCDs in adulthood.

Keywords: *University students, prevention, sustainable development Egyptian Strategy, and Non-communicable diseases*

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1. Introduction

A historic United Nations' (UNs) Summit on September 25, 2015, the world leaders adopted the 17 Sustainable Development Goals (SDGs) to be achieved by 2030. Three interconnected core elements, namely economic growth, social inclusion, and environmental protection are identified for sustainable and inclusive growth of all. The SDGs included non- communicable diseases in the health goal number 3 "ensure healthy lives and promote well-being for all at all ages." Of this, goal 3.4 targeted to reduce by one-third premature mortality from NCDs through prevention and treatment and promote mental health and well-being. As NCDs top among the all-cause mortality, there is a need to work on the global health agenda. Sustainable Development Goals for NCDs which are acceptable to both developing and developed countries [1].

University students are tremendous resource that is often overlooked in the fight against NCDs, yet they are a natural partner for preventing NCDs. World Health

Organization (WHO) estimates that 70 percent of premature deaths in adults are the result of risk factor behaviors begun during adolescence and youth. As a result, two thirds of premature deaths in adulthood are associated with childhood conditions and behaviors. Behavior associated with NCDs risk factors is common in young people: Over 150 million young people smoke; 81% youth don't get enough physical activity; 11.7% of adolescents partake in heavy episodic drinking. University students are an opportunity to reinforce the benefits of positive behaviors through appropriate messages and programs. Experts estimate that the projected burden of NCDs could be cut in half or more by focusing on health promotion and disease prevention [2].

Non- communicable diseases are one of the biggest public health challenges of the 21st century. The social and economic impacts of NCDs are threatening progress towards sustainable development. NCDs are the leading causes of death, causing 16 million premature deaths annually. Four main groups of diseases cardiovascular diseases, cancers, chronic respiratory diseases and diabetes account for 82% of all NCDs attributable to deaths. By 2025, the global economic cost from these four groups of diseases is predicted to surpass 51 trillion United States dollars. NCDs disproportionately affect people in low and middle-income countries. The probability of dying prematurely from NCDs in a low and middle-income country is four times higher than that in high income countries [3].

Non-communicable diseases have multi-factorial and complex causes. Risk factors can be categorized as modifiable behavioral risk factors and non-modifiable individual risk factors. The important way to control NCDs is through reducing the associated behavioral risk factors like smoking, alcohol use, physical inactivity and unhealthy diet. These behavioral risk factors are closely linked with other social determinants like inequitable access to healthcare, poverty, gender, dietary factors and education. The lack of physical exercise and lower intake of fruits and vegetables, coupled with unhealthy food habits is rapidly progressing in urban poor populations [4].

Adequate dietary habits and regular practice of physical activities and exercises are important components of a healthy lifestyle that are associated with prevention and decreasing the risk of NCDs. Notwithstanding, sedentary behavior (physical inactivity) allied to a lower intake of fruits, vegetables, cereals, and fibers, as well as higher intake of fatty, fried, salted, caloric foods, snacks, and soft drinks have been associated with increased chronic disease risk in children and adults [5].

Community Health Nurses (CHNs) make an important contribution in tackling NCDs and as the largest group of health care professionals are the key providers of NCDs prevention, treatment and management. CHNs as the point of first contact, are well positioned to detect, treat and refer patients with NCDs as well as to provide information, education and counseling to the public on prevention of NCDs. CHNs are well prepared to provide behavioral and lifestyle interventions that consider the social determinants of health and build on the strengths and resources of the individual and the community. CHNs can advocate for health policies that integrate NCDs prevention into health planning, nursing curriculum and workforce strengthening [6].

1.1. Significance of the Study

Non-communicable diseases are the current leading cause of mortality in Egypt, with NCDs estimated to account for 85% of all deaths. Cardiovascular diseases accounted for the most deaths of all non-communicable diseases 46%, followed by cancer 14%, chronic respiratory diseases 4% and diabetes 1%.Alarmingly, NCDs related premature mortality (between ages 30 to 70 years) is occurring at 25 percent. The use of tobacco, consumption of alcohol, unhealthy dietary practices and physical inactivity are the leading behavioral risk factors for NCDs. There are 46% of males and 45% of females are current smokers. 31% percent of the Egypt population is physically inactive. 60% of adults with excess weight (overweight plus obesity, 55.2% of males and 70.2% of females) and raised blood pressure of 36% for the same group. Additionally, the raised blood glucose prevalence is estimated to be 9.2%. NCDs are affecting more people in the prime economically productive years with death frequently preceded by years of disability [7].

Nurses can play an integral role in preventing, reducing, and treating NCDs. Nurses can and must transform from a strictly curative role to a role in disease prevention and health promotion; they should provide prevention program on an individual and community level.

The Sustainable Development Goals (SDGs) is a globally accepted developmental agenda, and it is expected that everyone everywhere in the world would be aware, knowledgeable and be willing to contribute to its attainment.

1.2. The Aim of the Study

This study aimed to evaluate the effect of the program for prevention non- communicable diseases according to sustainable development Egyptian Strategy 2030 among female University students at Benha City **through:**

- Assessing the female University students' knowledge about non communicable disease according to sustainable development Egyptian Strategy 2030.
- Assessing the female University students' life style reported practices for prevention NCDs
- Assessing the female University students' attitude regarding NCDs
- Designing and implementing program for prevention NCDs among female University students
- Evaluating the degree of improvement of female University students` knowledge, reported lifestyle practices and attitude for prevention NCDs diseases according to sustainable development Egyptian Strategy 2030.

1.3. Research Hypothesis

The program will improve female University students` knowledge; lifestyle reported practices and attitude for prevention non communicable disease according to sustainable development Egyptian Strategy 2030.

2. Subjects and Method

Study Design: A quasi- experimental design was utilized in carrying out this study.

2.1. Study Setting

This study was conducted at the Female University Town at Benha City.

2.2. Sample

A simple random sample was used. The total numbers of students at Female University Town was 400, 25% (100) students were chosen in this study

2.3. Tools of Data Collection

One tool was used for data collection: **A structured interviewing questionnaire:**

It developed by the researchers based on literature review and written in a simple clear Arabic language consisted of three parts.

First part: It was included socio-demographic characteristics (age, residence, family income, smoking, alcohol, frequency of disease, use of medication with frequency and family history for NCDs)

Second part: Included questionnaire to assess female university students` knowledge about non-communicable disease according to sustainable development health strategy 2030. This part included questions related meaning of sustainable development of health strategy (3 questions), third goal of sustainable development of health strategy related to NCDs (3 questions), meaning of non- communicable disease (2 questions), meaning of DM (2 questions), risk factors associated with diabetes (8 questions), early signs of diabetes(8 questions), preventive measures for diabetes (8 questions), meaning of cardio vascular diseases (2 questions), risk factors associated with cardio vascular diseases (11 questions), early signs o f cardio vascular diseases (10 questions), preventive measures for cardio vascular diseases (8 questions), meaning of Chronic Respiratory Diseases (CRDs) (2 questions), risk factors associated with (CRDs) (8 questions), early signs of CRDs (5 questions), preventive measures for CRDs (5 questions), meaning of cancer(3 questions), risk factors associated with cancer (8 questions), early signs of cancer (9 questions), preventive measures for cancer (7 questions).

Scoring system for knowledge items was adapted as follows:

The good knowledge was scored (2), the average knowledge was scored (1) and the poor knowledge was scored (0). For each area of knowledge, the score of the items was summed- up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into a percent score. The total knowledge scores were considered good if the score of the total knowledge >75 %, considered average if it equals 50-75 %, and considered poor if it less than 50%.

Third part: Lifestyle reported practices among the female University students for prevention of non-communicable disease**,** this part included diet (10 items), physically activity (3 items), establish good sleeping routine (5 items), stay away from stress, alcohol and smoke (3 items) and make regular checkup (3 items).

2.4. Scoring System for Lifestyle Reported Practices

Each item has 2 levels of answers: Done, and not done. These were respectively scored 1, 0. The scores of the items were summed- up and the total divided by the number of the items, giving a level score. These scores were converted into a percent score. The total of lifestyle reported practices was considered satisfactory if the score ≥60 % and considered unsatisfactory if it less than 60%.

Fourth part: Scale to measure the attitude of the female University students for non-communicable disease, adapted from [8].The questionnaire was measured on a Likert type scale of (Agree, Uncertain and Disagree). It was translated into Arabic by the researcher which included (8 items). NCDs can`t be transmitted from one person to another, green leafy vegetables should be added daily in diet to prevent NCDs, daily fruit intake can prevent NCDs, avoiding excess salt intake prevent NCDs, daily physical activity help in preventing NCDs, screening for NCDs be done regularly, regular medication is important in treatment of NCDs and change in lifestyle can prevent occurrence of NCDs.

2.5. Scoring System for Students` Attitude

Attitude scale score was calculated as (2) scores for agree, (1) scores for uncertain and (0) for disagree.

The total attitude score was considered positive if the score ≥60 %, and considered negative if it is <60%.

2.6. Content Validity and Reliability of the Tools

All tools were reviewed by panels' expertise in community health nursing to test the content of validity. According to expert suggestions and comments modification was considered. Reliability of the tool was applied by the researcher for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared.

2.7. Ethical Consideration

Permission has been obtained orally from each female University students before conducting the interview and given a brief orientation to the purpose of the study. They were also reassured that all information gathered would be confidential and used only for the purpose of the study. No names were required on the forms to ensure anonymity and confidentiality. They were also informed about their right to withdraw at any time from the study without giving any reasons.

2.8. Pilot Study

A pilot study was carried out on 10% (N=10) of the studied female University students at the previously mentioned settings to test the study tools for clarity, applicability to fill out the questionnaires. The necessary

modifications were done through omission of unneeded or repeated questions and improvements were made prior to data collection according to the pilot study results. The sample of the students who participated in the pilot study was included from the main study sample.

2.9. Administrative Approval

Official permission was obtained by submission of an official letter from the Faculty of Nursing, Benha University to the responsible authorities of the Female University Town at Benha City to obtain the permission for data collection.

2.10. Field Work

Data were collected over 4 months in addition to 2 weeks for pre-test, the date collected from the first February 2019 to the end of May 2019. The study was conducted by the researcher for the studied sample in the selected settings at the Female University Town at Benha City. The researchers were attended the previously mentioned study setting 3 days/week from 3:00 pm-5:00 pm.

2.11. Program Construction for Prevention Ncds

The current program was carried out on four phases.

1. Program assessment phase: The program was designed after extensive review of related literature, by the researchers. Based on results obtained from pre-assessment tools, it was revised and modified. Before implementation the program, the researcher visits the selected Female University Town at Benha City to explain the nature and purpose of the study, as will to discuss the plan of work to ensure their cooperation.

2. Program development phase: The program was developed based on the actual results that were obtained from pre-program assessment.

An objective of the program was to evaluate the effect of the program for prevention non- communicable diseases according to sustainable development Egyptian Strategy 2030 among female University Students at Benha City.

Contents of program: it included:

- Sustainable development of health strategy on non- communicable disease
- Meaning, risk factors, sign and symptoms and prevention of NCDs
- Life style reported practices for prevention NCDs

2.12. Teaching Methods

Methods used in teaching the program content included the following: Lectures, discussion, role play and presentation.

2.13. Teaching Aids

Suitable teaching aids were specially prepared for the program application as: Handout, lab top CD, and posters.

2.14. Implementation of the Program

Implementation of the program took 4 months in addition to 2 weeks for pre-test, the data collected from the first February 2019 to the end of May 2019. The researchers were attended the previously mentioned study setting 3 days/week from 3:00 pm - 5:00 pm.; the study was conducted by the researcher for the studied sample in the selected settings at the Female University Town at Benha City. The program carried out in 6 sessions (4 theoretical, 2 practical). The duration of each session ranged from 30 to 45 minutes including times for discussion according to students' achievement, progress and feedback. Each session started by a summary about the previous session and the objectives of the new one.

Discussion, motivation and reinforcement during program sessions were used to enhance learning. Direct reinforcement in the form, a copy of the program was given as a gift for each student to use it as future reference. All the students were cooperative with the researcher. At the end of each session, students participated in a discussion to correct any misunderstanding. Also, they were informed about the time of the next session.

2.15. Fourth Phase

Evaluation of the program was carried out after session implementation immediately posttest.

2.16. Statistical Design

The collected data were verified prior to computerized entry; statistical analysis was done by using the Statistical Package for Social Science (SPSS) version 20. Data were presented in tables by using mean, standard deviation, number, percentage distribution, and Chi- Square. Statistical significance was considered at: P- Value > 0.05 insignificant, P- Value ≤ 0.05 significant, and P- Value ≤ 0.001 highly significant.

3. Results

Table 1. Percentage distribution of the studied female University students according to their socio-demographic characteristics (n=100)

Scio-demographic characteristics	%
Age / years	
≤18	46.0
20-	54.0
Residence	
Rural	76.0
Urban	24.0
Family Income	
Enough	55.0
Enough and saved	22.0
Not enough	23.0
Smoking	
Never smoking	100.0
Alcohol	
Never used	100.0
Frequency of disease	
Yes	4.0
No	96.0
Use of medication with frequency	
Yes	4.0
No	96.0

Table 1: Shows the socio- demographic characteristics of the studied female University students. 54% of studied female University students their aged was 20 and more years, 76% of them lived in rural areas and 55% of them had enough family income, while all of them never smoking and never use alcohol. This table also shows that, 96% of studied female University student didn`t have frequency of disease and only 4% used medication with frequency.

Figure 1: Shows that 34% of the studied female University students` family history for NCDs had hypertension and only 3% had cancer.

According to the research hypothesis; the program will improve female University students` knowledge, lifestyle reported practices and attitude for prevention non-communicable disease according to sustainable development Egyptian Strategy 2030 (Table 2, Table 3, Table 4 & Figure 2, Figure 3, Figure 4).

Table 2: Shows that there was improving in studied female University students' knowledge items after program phase's implementation. Regarding the knowledge about DM, 4% of the studied female University students had good knowledge before program compared with 65% at post program. Concerning knowledge about cancer 2% of the studied female University students had good knowledge before program which increased to 53% in the post program. In addition, the table also shows that there were highly statistically significant differences in the items related to the studied female University students' knowledge.

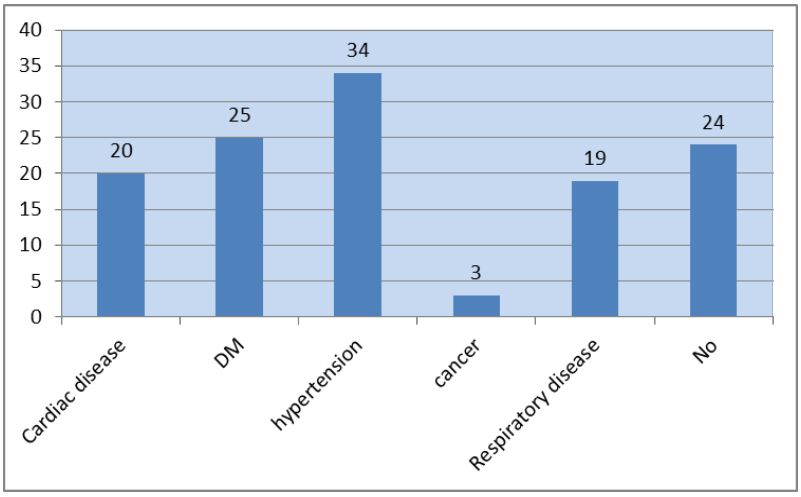

Figure 1. Percentage distribution of studied female University students regarding their family history for non-communicable disease.

Table 2. Statistically differences between knowledge scores of studied female University students` pre and post program (n=100)

Items of knowledge	Pre- program %			Post- program %			X2	p-value
	Good	Average	Poor	Good	Average	Poor		
Knowledge about sustainable development regarding NCDs	6.0	39.0	55.0	61.0	35.0	4.0	89.4	≤ 0.001**
DM	4.0	38.0	58.0	65.0	31.0	4.0	101.6	≤ 0.001**
CVDs	3.0	44.0	53.0	57.0	35.0	8.0	82.8	≤ 0.001**
CRDs	6.0	41.0	53.0	54.0	35.0	11.0	66.4	≤ 0.001**
Cancer	2.0	32.0	66.0	53.0	31.0	16.0	77.7	≤ 0.001**

*Statistically significant difference p ≤ 0.05 **Highly significant difference ≤0.001

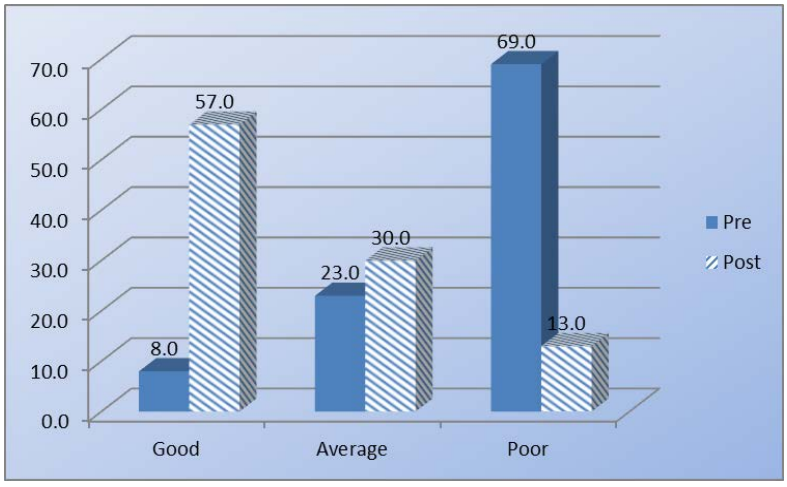

Figure 2. Percentage distribution of studied female University students regarding total knowledge scores pre and post program

Figure 2: Shows that 8% the studied female University students had good knowledge before program, and then this percentage increase to 57% post program.

Table 3: Shows that there was improving in the studied female university students' lifestyle reported practices items post program phase's implementation. 61% of studied university female students had satisfactory practices regarding stress before program, and then this percentage increased to 91% post program, 58% of them had satisfactory practices regarding diet then this percentage increased to 88% during post program. Regarding activity 29% of them had satisfactory practices compared with 73% during post program. There was a highly statistically significant difference in the items related to studied female University students' lifestyle reported practices, where p <0.001.

Figure 3: Shows that 37% of the studied female university students had satisfactory lifestyle reported practices before program, and then this percentage increased to 84% during the post program.

Table 4: Shows that; 48% of studied female University students agreed that daily physical activity help in preventing NCDs and then this percentage increased to 91% post program. 45% of them agreed that regular medication is important in treatment of NCDs compared with 78% post program. There was a highly statistically significant difference in the items related to female University students` attitude, where p <0.001.

Figure 4: Reveals that 55% of studied female University students had negative attitude regarding NCDs before program, while this percentage decreased to 35 % post program.

Table 5: Shows that there was significant difference between female University students` total knowledge scores and female University students` income pre-program.

Table 6: Shows that there was no significant difference between female University students` total attitude scores and female University students ` age and residence pre and post program.

Table 3. Statistically differences between lifestyle reported practices scores of studied female University students` pre and post program (n=100)

Items of practices	Before- program %		Post- program %		X2	p-value
	Satisfactory	Unsatisfactory	Satisfactory	Unsatisfactory		
Diet	58.0	42.0	88.0	12.0	22.8	≤ 0.001**
Activity	29.0	71.0	73.0	27.0	38.7	≤ 0.001**
Sleeping	49.0	51.0	82.0	18.0	24.0	≤ 0.001**
Smoking	88.0	12.0	91.0	9.0	0.47	0.48
Stress	61.0	39.0	91.0	9.0	24.6	≤ 0.001**
Check up	29.0	71.0	82.0	18.0	56.8	≤ 0.001**

*Statistically significant difference p ≤ 0.05 **Highly significant difference p ≤ 0.001

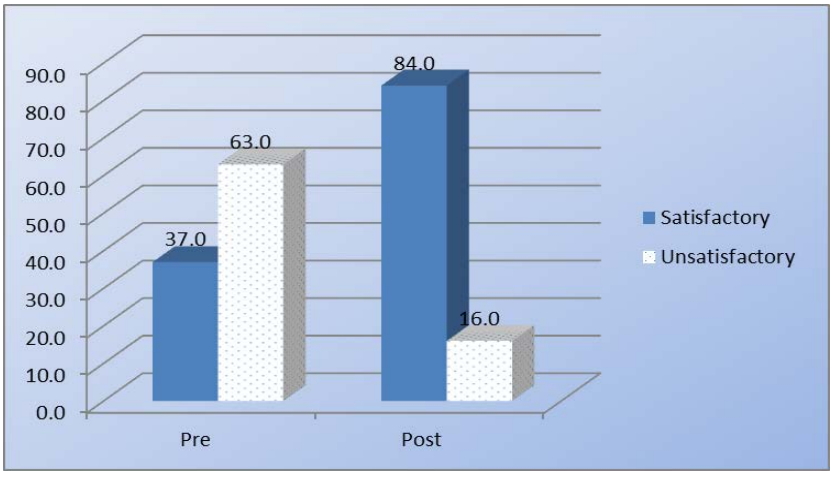

Figure 3. Distribution of studied female University students` regarding total life style reported practices scores pre and post program(n=100).

Table 4. Statistically differences between studied female University students` regarding attitude pre and post program (n=100)

Items of practices	Before- program %			Post- program %			X2	p-value
	Agree	Uncertain	Disagree	Agree	Uncertain	Disagree		
Disease can`t be transmitted from one person to another	36.0	22.0	42.0	68.0	29.0	3.0	44.6	≤ 0.001**
Green leafy vegetables should be added daily in diet to prevent NCDs	41.0	35.0	24.0	78.0	22.0	0.0	38.4	≤ 0.001**
Daily fruit intake can prevent NCDs	39.0	43.0	18.0	88.0	12.0	0.0	54.3	≤ 0.001**
Avoiding excess salt intake prevent NCDs	27.0	52.0	21.0	77.0	20.0	3.0	51.7	≤ 0.001**
Daily physical activity help in preventing NCDs	48.0	28.0	24.0	91.0	9.0	0.0	47.0	≤ 0.001**
Screening for NCDs be done regularly	42.0	29.0	29.0	78.0	22.0	0.0	40.7	≤ 0.001**
Regular medication is important in treatment of NCDs	45.0	17.0	38.0	78.0	15.0	7.0	30.3	≤ 0.001**
Change in life-style can prevent occurrence of NCDs	33.0	26.0	41.0	69.0	19.0	12.0	29.6	≤ 0.001**

*Statistically significant difference p ≤ 0.05 **Highly significant difference p ≤0.001

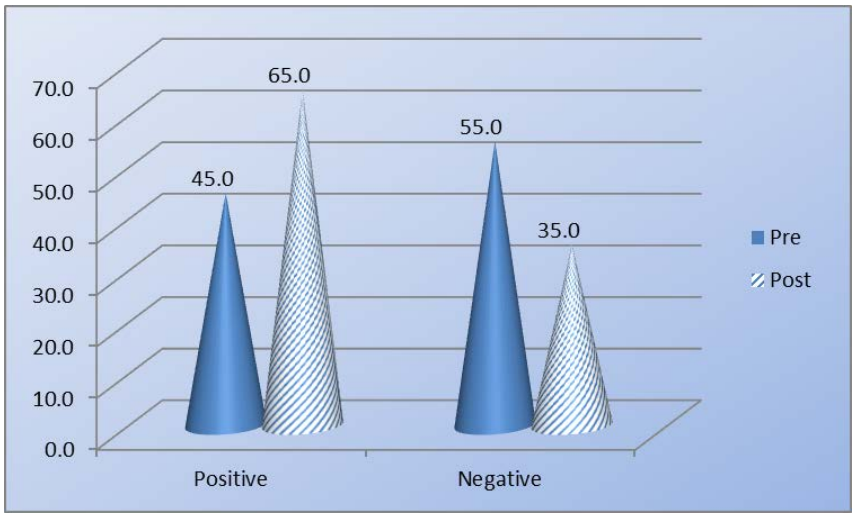

Figure 4. Percentage distribution of studied female University students regarding total attitude scores pre and post program

Table 5. Relation between socio-demographic characteristics and the studied female University students ' total knowledge scores (n= 100)

Scio-demographic characteristics	Total Knowledge scores Pre			Total Knowledge scores Post		
	%	%	%	%	%	%
	Poor (n=69)	Average (n=23)	Good (n=8)	Poor (n=13)	Average (n=30)	Good (n=57)
Age						
≤18	46.4	34.8	75.0	53.8	43.3	45.6
20-	53.6	65.2	25.0	46.2	56.7	54.4
	X^2=3.87	p-value =0.14		X^2=0.41	p-value =0.18	
Residence						
Rural	82.6	73.9	25.0	100.0	90.0	63.2
Urban	17.4	26.1	75.0	0.0	10.0	36.8
	X^2=13.1	p-value ≤ 0.001**		X^2=12.4	p-value =0.002*	
Income						
Enough	63.8	47.8	0.0	46.2	50.0	59.6
Enough and saved	34.8	43.5	100.0	46.2	50.0	36.8
Not enough	1.4	8.7	0.0	7.7	0.0	3.5
	X^2=16.1	p-value =0.003*		X^2=3.32	p-value =0.50	

*Statistically significant difference p ≤ 0.05 **Highly significant difference p ≤0.001

Table 6. Relation between socio-demographic characteristics and the studied female University students ' total attitude scores pre and post program (n= 100)

Scio-demographic characteristics	total attitude scores -Pre		total attitude scores - Post	
	Negative (n=55	Positive (n=45)	Negative (n=35)	Positive (n=65)
Age				
≤18	40.0	53.3	48.6	44.6
20-	60.0	46.7	51.4	55.4
	X^2=1.77	p-value =0.18	X^2=0.14	p-value =0.70
Residence				0.
Rural	72.7	80.0	82.9	72.3
Urban	27.3	20.0	17.1	27.7
	X^2=0.071	p-value =0.39	X^2=1.38	p-value =0.23
Income				
Enough	61.8	46.7	57.1	53.8
Enough and saved	32.7	53.3	42.9	41.5
Not enough	5.5	0.0	0.0	4.6
	X^2=5.99	p-value =0.05*	X^2=1.67	p-value =0.43

*Statistically significant difference p ≤ 0.05 **Highly significant difference p≤0.001

Table 7: Shows that there was a positive statistically significant correlation between female University students `total knowledge scores and female University students `total lifestyle reported practices and attitude scores before and post phases of the program.

Table 7. Correlation between studied female University students` total knowledge scores, total life style reported practices scores and total attitude scores pre and post program

Items	University students `total knowledge scores			
	Pre program		Post program	
	r	P-value	r	P-value
University students ` total lifestyle reported practices scores	0.57	≤ 0.001**	0.43	≤ 0.001**
University students ` total attitude scores	0.45	≤ 0.001**	0.44	≤ 0.001**

Table 8: Shows that there was a positive statistically significant correlation between female University students` total lifestyle reported practices scores and female University students` total attitude scores pre and post phases of the program.

Table 8. Correlation between studied female University students ` total life style reported practices scores and total attitude scores pre and post program (n=100)

Items	University students `total lifestyle reported practices scores			
	Before program		Post program	
	r	P-value	r	P-value
University students ` total attitude scores	0.54	≤ 0.001**	0.37	≤ 0.001**

4. Discussion

The SDGs include a specific target for NCDs and several targets related to them. They have been included in SDG-3 as a specific target at 3.4 to reduce premature mortality from NCDs by one third through prevention and treatment by 2030. SDG 3.5: The rise in NCDs can be attributed to modifiable risk factors such as unhealthy diets, the use of tobacco and the harmful use of alcohol, and physical inactivity. The burden of NCDs can be addressed by prevention and reducing exposure to and increasing the management of these risk factors. As prevention is better than cure, it is essential to address modifiable risk factors, especially under huge resource constraints, and to reduce the suffering of every society [9]. Commonly existing NCDs include diabetes mellitus, cardiovascular diseases, cancers, and chronic respiratory diseases. Among the main contributing factors are older age and unhealthy lifestyle-related behaviors, hence the term “lifestyle- related diseases [10].

Regarding socio-demographic characteristics of this study subject revealed that, more than half of studied female University students their aged were 20 and more years and had enough family history and most of them didn`t have a frequency of disease (Table 1). This finding was supported by Morais et al. [11], they studied the modifiable risk factors for chronic non-communicable diseases among University students in Brazil, (N=323), they reported that less than three quarter (74, 5%) with an average age of 20 years, and the majority had enough family income, considered themselves to be in good health (81.6%) and the minority (13.7%) had chronic non-communicable diseases diagnosed.

As regards family history, slightly more than one-third of studied female University students' family had hypertension (Figure 1). This finding was disagreement with Desouky et al. [12], they studied the risk factors of non-communicable diseases among female University students of the Health Colleges of Taif University (N=227), they reported that only 4 % had hypertension of family history.

Regarding the students’ knowledge score; the results of the current study declare the students’ total knowledge of Non- Communicable Diseases; the pre-test of the present study revealed that most of them had unsatisfactory knowledge about NCDs. This lack of knowledge may be attributed to that all of them were rural residences. After the implementation of the program, the results indicated that there is a significant increase in students’ knowledge. This improvement/progression could reflect the effect of the program, as well as wide verities of used educational used methods [13,14,15,16,17,18].

Concerning knowledge scores of female university students about sustainable development regarding NCDs, a minority of them had good knowledge before the program which increased to more than half in the post program (Table 2). This finding was consistent with Ade et al. [19], they studied the non-communicable diseases: Awareness of risk factors and lifestyle among rural adolescents in India, (N=340), they founded that more than half (62.6%) of students had no idea about NCDs. Furthermore this finding supported by Gilbert et al. [20], they studied the prevalence of risk factors for non-communicable diseases among University students in Kampala, (N= 2000), they founded that 67% of the University students either did not know what NCDs were could not specifically describe them. This finding agreement with Gamage & Jayawardana [10], they studied the knowledge of non-communicable diseases and practices related to healthy lifestyles among adolescents, in educational division in Sri Lanka, (N=130), they reported that knowledge about NCDs and healthy lifestyle practices were poor among University students, lack of knowledge about healthy and unhealthy behaviors highlights the importance of carrying out regular surveillance for NCD risk factors, and initiating programs for the prevention of NCDs amongst adolescents.

Concerning knowledge scores of female University students about sustainable development regarding NCDs, a minority of them had a good knowledge before the program (Table 2). This result in the same line with Wee et al. [21], they studied the awareness and attitudes towards sustainable development amongst higher education students in Penang, Malaysia. This study has shown that the awareness of students about the concept and issues of sustainable development were well developed. The survey, also, revealed that respondents were highly concerned about sustainability and were willing to practice more sustainable lifestyles.

Regarding the knowledge about DM and CVDs and cancer the present study revealed that the minority of the studied female University students had a good

knowledge before the program (Table 2). This finding was contradicting with Ade et al. [19], they showed that more than half (52.6%) of students heard about cancer, in addiction to nearly half students heard about cardiovascular diseases and diabetes mellitus. This finding disagreed with Obiebi [22], who studied the perception and screening practices for non-communicable diseases among Pentecostals in a Semi-Urban Community in Nigeria, (N=260), who reported that all participants were aware about diabetes mellitus and hypertension. This might be due to lack of educational program about NCDs among University students.

Concerning the total knowledge scores of studied female University students regarding NCDs, the result of the current study revealed that the minority of them had a good knowledge before the program, and then improving to more than half post-program (Figure 2). This finding was agreement with Gupta et al. [23], they studied the a cross‑sectional study to evaluate awareness about non-communicable diseases among rural adolescents in northwest India, (N= 318), they reported that lack of knowledge among adolescents about NCDs and, they reported that adolescence is a transition phase which has been recognized as vulnerable as far as risk behavior for NCDs is concerned. Hence, awareness and knowledge of NCDs in this particular age group are of immense public health value. Health education remains a long-term measure of NCDs prevention (in all the populations irrespective of caste, creed, and religion).This might be due to program was improve University student knowledge about sustainable development Egyptian strategy 2030 on non-communicable disease.

As regards studied female University students' lifestyle reported practices. In the present study more than half of them had satisfactory practices regarding diet then increased to majority of them during post program. Regarding physical activity more than one quarter of them had satisfactory practices compared with majority of them during post program (Table 3). This finding was in the same line with Gilbert et al. [20], They founded that, most students (56%) ate a healthy diet. only 7% of university students do not eat healthy diet; they do not eat vegetables and more fruits, while about 83% of university students reported engaging in physical activity for at least 60 minutes in day. The most common physical activities are jogging (26%), walking (18%) and a variety of games (14%).

While, the present study showed that there was improving in the studied female university students' lifestyle reported practices items post-program phase's implementation (Table 3**):** This might be due to the present study demonstrated that program was effective on improving university students' practices to help them to follow health lifestyle to prevent exposing them for NCDs.

Concerning studied female University students` regarding total lifestyle reported practices scores; more than one-third of them had satisfactory practices before the program, and then improving to majority during the post-program (Figure 3). According to Gamage and Jayawardana [10], they reported that the knowledge and lifestyle practices of adolescent students with regard to NCD's and their primary prevention were found to be unsatisfactory. This highlights the importance of establishing a system for NCD risk factor surveillance and implementing awareness-raising programs among this group.

Regarding to the attitude of studied female University students; the present study revealed that less than half of female University student agreed that daily physical activity help in preventing NCDs before program. In addition less than half of them agreed that regular medication is important in treatment of NCDs before program. Furthermore one third agreed that change in life style can prevent occurrence of NCDs before program (Table 4). This finding was in the same line with Gupta et al. [23], they reported that more than three quarters of studied sample believed that daily physical activity help in preventing NCDs, and the majority of them believed that regular medication is important in treatment of NCDs, also more than half of them believed that change life-style can prevent occurrence of NCDs. Although this finding supported by Zahorka [24], who study the knowledge, attitudes, practices and behavior: Non-Communicable diseases, Child Health and Citizens' Right to Health in Kosovo, (N=200), who reported that the majority of respondents believe that they should seek medical treatment if they or their family member or friend has an NCDs.

Regarding total attitude scores of studied female University students, the present study revealed that more than half of studied female university students had a negative attitude regarding NCDs before program, while this percentage decreased to more than one third post-program (Figure 4). This might be due to the program was effective in changing students` attitude about NCDs because the University students more vulnerable to NCDs.

The present study revealed that there was significant difference relation between total knowledge scores of female University students and their family income and there was highly significant difference relation between total knowledge scores of University students and their residence preprogram (Table 5). These findings were in the same line with Zahorka [24], who reported that the higher level of poverty amongst the study sample is reflected in their low knowledge about NCDs. Also, revealed that there were no significant differences between rural female and female in general. It might be due to the students who live in rural had low income may increase the risk for NCDs.

The current study showed that there was no significant difference between female University students` total attitude scores and female University students` age and residence pre and post program (Table 6). This finding disagreement with Morais et al. [11], they reported that the attitude about physical activities had a statistically significant association with gender.

The current study showed that there was a positive statistically significant correlation between female University students `total knowledge scores and female University students `total lifestyle reported practices and attitude scores before and post phases of the program (Table 7). This might be due to knowledge plays an important role in changing attitude leading to change of practices.

The current study showed that there was a positive statistically significant correlation between female University

students `total lifestyle reported practices scores and female University students `total attitude scores pre and post phases of the program (Table 8). It might be due to if the students had positive attitude it would lead to satisfactory practices.

5. Conclusion

Based on the results of the present study and research hypothesis, the study concluded that:

More than half of University students their aged was 20 and more years, and more than half of them had enough family history. The program succeeded to increase knowledge and improve lifestyle reported practices and change attitudes of female University students for prevention NCDs. The minority of them had a good knowledge before the program, and then improving to more than half post program. More than one third of them had a satisfactory lifestyle reported practices for prevention NCDs before program, and then improving to majority during the post program. More than half of studied female University students had a negative attitude regarding NCDs before program, while this percentage decreased to more than one-third post the program. There was a positive statistically significant correlation between female University students `total knowledge scores and female University students total lifestyle reported practices and attitude scores before and post phases of the program.

6. Recommendation

Based on a finding of the present study the following recommendations:

1. Continuous program for prevention NCDs among University students to increase their knowledge and practices. These programs should focus on the importance of practicing healthy lifestyles in this young age to prevent the occurrence of NCDs in adulthood.

2. Emphasize the importance of providing regular health check-up for University students by a specialized team in order to prevent occurrence and complication of NCDs.

3. Further research is proposed to explore the effect of program on the prevention of NCDs among large sample size.

4. Increase University students awareness about the importance of sustainable development strategy 2030.

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