Physical Activity, Behavioural and Emotional Changes among Adolescents in Nursing Secondary Schools

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Abstract

Background: Adolescence is aunique stage of human development and and an important tme for laying the foundations of good health. Adolescents experience rapid physical, cognitive and psychological growth. **Aim of the study:** Assess physical activity, behavioural and emotional changes among adolescents in nursing secondary schools at Beni-Sufe City**. Research design:** Across sectional descriptive research design will be used to achieve the aim of current study. **Sample:** all available adolescents in nursing secondary schools in the Village of Barout and Tzimant at Beni Suef. **Setting:** The nursing secondary schools in the village of Barout and Tzimant at Beni-Suef City. **Tool:** One tool used to achieve the aim of this study: Interviewing Questionnaire Sheet which consisted of four parts to assess personnel characteristics, family history and body mass index, knowledge about importance of physical activity, practice of physical activity and emotional and behavioral changes among adolescents. **Result:** The study showed that, 38.30% of the studied students had a good level of knowledge score, 66.5% of the studied students are physically inactive and 66.90 % of the studied students had a positive emotional and behavioral attributes. **Conclusion:** There was a highly positive association between studied students' total knowledge, physical activities and their emotional and behavioral attributes, that means increase student awareness regarding importance of physical activity will positively affect their practice toward physical activities and improve their emotional and behavioral changes. **Recommendation:** Further research about regular training program for adolescents to improve their knowledge regarding physical, behavioral and emotional changes. Increase awareness of students about importance of physical activity.

Keywords: Physical activity, Adolescents, Emotional changes

Introduction

The World Health Organization (WHO) defines 'Adolescents' as individuals in the 10-19 years age group , adolescence is a period of life with specific health and developmental needs and rights, it is also a time to develop knowledge and skills, learn to manage emotions and relationships, and acquire attributes and abilities that will be important for enjoying the adolescent years and assuming adult roles **(Ross et al., 2020).**

There are 1.3 billion adolescents in the world today, more than ever before, making up 16 per cent of the world's population. Defined by the United Nations as those between the ages of 10 and 19, adolescents experience a transition period between childhood and adulthood and with it, significant growth and development. As children up to the age of 18, most adolescents are protected under the Convention on the Rights of the Child. Egypt's young population is rapidly growing, the adolescents (aged 10-19) are around 17 million in Egypt, representing approximately 19 percent of the total population ***(Boutayeb, 2023)***.

Regular physical activity can help adolescents improve cardiorespiratory fitness, build strong bones and muscles, control weight, reduce symptoms of anxiety and depression, and reduce the risk of developing health conditions such as heart disease, cancer, type 2 diabetes, high blood pressure, osteoporosis and obesity so adolescents should do at least an average of 60 minutes per day of moderate-to-vigorous intensity, mostly aerobic, physical activity, across the week also they should incorporate vigorous-intensity aerobic activities, as well as those that strengthen muscle and bone, at least 3 days a week and they should limit the amount of time spent being sedentary, particularly the amount of recreational screen time **(Guthold et al., 2020).**

Emotional changes during adolescence

period vary widely from person to person and over time, you may find that your teen has a greater sense of self or has begun to take more sexual interest in other people. Adolescents sometimes respond to the hormonal changes associated with puberty by feeling self-conscious about the way they look, begin to feel more empowered to take on new responsibilities and make their own decisions. They may also develop a strong need for social connections outside the family and may seek independence in some aspects of their lives and may feel frustrated when they are unable to reach their goals and may consequently experience negative emotions***(Ryan* et al., *2020).***

Beside that, it can be reassuring to remember that these emotional changes are an important part of your adolescents growth, so important that help adolescents navigate this period of emotional change by showing patience, support, understanding, give them space to process their feelings and support, also independent problem-solving, maintain healthy boundaries and expectations while giving your teen opportunities to express independence in a safe and healthy way. Help them understand their moods and the effect of puberty on their bodies and emotions. Teenagers need to be made aware that violence and aggression towards anybody is unacceptable. If your teenager is being aggressive towards you, tell them you are walking away and you will return when they have calmed down ***(Katwan et al., 2022)***.

Behaviorally, adolescence is associated with volatile emotions and boundary-testing behavior as individuals explore and assert personal identity, learn to navigate peer relations, and transition to independence. Some of the changes in adolescents behavior are explained by the way teenage brains develop. Thhe part of the brain responsible for impulse control don't fully mature until about age 25. But you might be worried if there are changes in your adolescent behavior as mood swings, withdrawal from family or friends and usual activities, or poor school attendance **(Kågesten *et al.,* 2021).**

Nurses are in the unique position to contribute to the health of the adolescents by identifying adolescents' health challenges and provide essential care needed to ensure optimum growth and well-being of the adolescents. Community health nurses work in schools, churches, and government agencies. They focus on vulnerable populations, including adolescents, low-income families, people living in rural areas, immigrants, and individuals with disabilities ***(Trent* et al., *2019).***

Significance of the Study

Adolescence is a period of life with specific health and developmental needs and rights. Egypt's young population is rapidly growing, the adolescents (aged 10-19) are around 17 million in Egypt, representing approximately 19 percent of the total population. Together with youth in the age group 20-24 years, an additional 9 million, adolescents and youth represent almost one third of the Egyptian population ***(Boutayeb, 2023)***.

United nations fund population agency (UNFPA) promotes and protects the rights of adolescents. It envisions a world in which girls and boys have optimal opportunities to develop their full potential, to freely express themselves and have their views respected, and to live free of poverty, discrimination and violence. To achieve this, UNFPA works across sectors and with many partners to: Empower adolescents and youth with skills to achieve their dreams, think critically, and express themselves freely; Promote health, by giving them access to sexual and reproductive health information, education, commodities and services ***(Tallarico* et al., *2021).***

Also, united nations international children's emergency fund (UNICEF) amis at enhancing the ability of female and male adolescents to play agreater role in their society by support interventions to improve their access to information and develop their skills. Moreover, fosters sports for development initiatives that use sports and physical activity to address inclusion and enhance the life skills ***(Reilly et al., 2022).***

Finally, Egypt's overall policy environment for reproductive health with regard to youth and adolescents has been continuously improving, although not yet enabling enough for young people. Egypt's constitution supports the

protection of mothers, children, and youth and guarantees the right of women to medical, physical, psychological, and social healthcare ***(Boutayeb, 2023)*.**

Therefore, this study will be done to assess physical activity, behavioural and emotional changes among adolescents.

Aim of the study

The aim of the study is to assess for physical activity, behavioural and emotional changes among adolescents in nursing secondary schools at Beni-Sufe City through the following:

1. Assess physical activity and emotional changes among adolescents in nursing secondary schools.
2. Assess behavioral changes among adolescents in nursing secondary schools.

Research question

To fulfill the study purposes, the following research questions will be answered:

1. What are physical activities, behavioral and emotional changes for adolescents?
2. What is the relationship between personnel characteristics & physical activity?
3. What is the relationship between personnel characteristics & behavioral and emotional changes?
4. What is the relationship between physical activity & behavioral changes?

Subjects and Methods

The Subjects and methods for this study will portray under the following four designs as follows:

I. Technical Design
II. Operational Design
III. Administrative Design
IV. Statistical Design.

I. Technical Design

The technical item includes research items, settings, subjects, and tools for data collection.

Research design:

Across sectional descriptive research design will be used to achieve the aim of current study.

Setting:

The study was conducted at the Technical Secondary School of Nursing for Boys in the village of Barout and the Technical Secondary School of Nursing for Girls in the eastern village of Tazmant in Beni Suef Governorate. The number of technical secondary schools for nursing affiliated to the Directorate of Health in Beni Suef is 8 schools, including 7 schools for girls and a school for boys at the governorate level Therefore, a girls' school and a boys' school were chosen to assess the physical activity, emotional and behavioral changes that occur among adolescents in these schools.

Nursing schools accept those who have a preparatory certificate from the people of the governorate. The study for a period of 5 years, after graduation, the student obtains a nursing technician certificate, in addition to obtaining a license to practice a profession from the Ministry of Health and obtaining a nursing syndicate card.

The Nursing School for Boys in the village of Barout is the first and only one at the level of Beni Suef Governorate, so the school accepts those who have a preparatory certificate from all schools in the governorate. The nursing school is located inside the local unit complex of the village of Barout in Beni Suef Governorate. The school consists of two floors, and the school is equipped with teaching and practical rooms and a library A computer room and nursing skills laboratories.

The Nursing School for Girls in the eastern village of Tazmant is considered one of the nursing schools in Beni Suef Governorate, so the school accepts only those who have a preparatory certificate from the Beni Suef Center. The nursing school is located inside the rural hospital in the eastern village of Tazmant. Consisting of two floors, the school is equipped with teaching and practical rooms, a library, a computer room, and nursing skills laboratories.

Sample size:

The researcher was take all available adolescents in nursing secondary schools in the Village of Barout and eastern Tazmant at Beni Suef. The study sample size represents 25% of the total schools (2 schools from 8 schools of the secondary nursing schools in Beni Suef

Governorate), it consists of 227 student (of them 82 boy and 145 girl), for 6 months from the beginning of the study, an average of 2 day/week.

Tools for Data Collection:

One tool used to achieve the aim of this study.

Tool I: Interviewing Questionnaire Sheet:

It was developed by researcher after reviewing the national and international related literature. It was contain 4 parts.

Part I (A): Personnel characteristics.

This part include age, gender, school and residence.

Part I (B): Family history (Tables 2).

This part include number of family members, father educational level, mother educational level, father occupation, mother occupation, family income and people living with.

Part I (C): body mass index (Tables 3).

This part include underweight, normal and overweight.

Part II: Knowledge about importance of physical activity (Table 4).

This tool was itemed by the investigator based on the literature review and, this tool was concerned with knowledge of students about importance of physical activity that contains 6 items such as:

1. Provide a very good opportunity to release and replenish energies.
2. Physical activity increases muscle fitness and cardiorespiratory fitness.
3. Improve memory and enhance academic performance.
4. Physical activity increases the release of endorphins which is a Happy hormone that improves the mood thus making the person happier and joyful.
5. Improves the metabolism leading to weight loss and preventing diseases like diabetes, and heart disease, decreasing blood pressure.
6. Manage and prevent noncommunicable diseases like diabetes, heart disease, stroke, and a number of cancers.

Scoring system:

For each question the answer scored as (1) for correct and (0). For incorrect.

Total knowledge score was calculated as the following:

Good: > 75% of total knowledge score
Fair: 60-75% of total knowledge score
Poor: < 60% of total knowledge score

Part III: Practice of physical activity (Table 5).

It was developed by **Kgokong & Parker (2020)** and reviewing related literature review to assess the number of times that students' practice physical activity per week.

This tool was concerned with physical activity practice include

- **Aerobic activities** such as cycling, walking, running, swimming or dancing.
- **Muscles strengthens activities such** as jumbling, climbing or gymnastic.
- **Sedentary activities** such as television viewing, computer, telephone use or Video games.

Scoring system

For each type of physical activities each students were asked how many times they participate this type of physical activities per week, 0 for nerve practice, 1 for one time, 2 for twice per week, 3 for three times, 4 for 4 times, 5 for five times, 6 for six times, and till 7 that means 7 times per week.

Total physical activity score was calculated as the following:

Physically active ≥ 60% of total physical activity score.
Physically inactive < 60% of total physical activity score.

Part IV: Emotional and behavioral attributes among adolescents (Table 6).

This tool was developed by ***Rajan et al. (2018).*** It used to assess emotional and behavioral changes among adolescents.

Behavioral and emotional attribute include the following items.

Part (1): Feeling overly sensitive include 4 questions such as:

- Are you conscious about losing your weight?
- Have you thought of building your muscles?
- Have you thought of building your muscles?
- Are you conscious about pimples and taking care of it?

Part (2): Looking for an identity include 3 questions such as

- Did you think of getting good marks than your friends?
- Have you joined in sports to show up your talents?
- Are you daydreaming about unrealistic goals and wanted to be a supermodel one day?

Part (3): Feeling uncertain include 1 question such as

- I never wanted to do certain things (eg. doctor) Because I thought it doesn't suit with my talent

Part (4): Conflicts in thought include 2 questions such as

- Are you finding difficult to take any decision?
- Are you struggling with your studies and lead to a state of emotional tension?

Part (5): Peer pressure include 4 question such as

Will you feel depress often?

- When your friends getting good marks, but you Couldn't?
- When your friend dress up nicely, but you couldn't?
- When your friend having mobile or wrathful things?

Part (6): Mood swings include 4 question such as

- Are you often change your mind from happy to sad or irritable suddenly?
- Will you argue or fight for small things with your friends or parents?
- Are you feeling isolated?
- Do you have lack of sleep or disturbed sleep

Scoring system

For each question included in the emotional and behavioral attributes the answer was scored as, (1) for yes and (0) for no.

Total emotional and behavioral changes score was calculated as the following:

Negative emotional and behavioral changes:

- < 60% of total emotional and behavioral changes

Positive emotional and behavioral changes:

- ≥ 60% emotional and behavioral changes.

Tools Validity:

Validity of the study tools was assessed by jury group consisted of six experts in nursing from faculty of nursing Beni-Suef University. Jury group members judge tools for comprehensiveness, accuracy and clarity in language.

Based on their recommendations correction, addition and / or omission of some items were done. The main modification was regarding developing a discharge planning knowledge tool that included a questions regarding discharge planning process, characteristics etc….

Reliability:

The study tool was tested for its internal consistency using Cronbach's Alpha. It was 0.879 for knowledge questionnaire, 0.753 for physical activity practice tool, and 0.843 for emotional and behavioral changes.

Ethical Considerations:

Before the pilot study, ethical approval was obtained from the Research Ethics Committee of the Faculty of Medicine, Beni Suef University. Official permission was taken from the accredited staff in the mentioned schools. Written or oral consent was obtained from all adolescents in nursing schools. The purpose and nature of the study were explained to them before the interview.. The investigators will confirm that participation in the study is entirely voluntary; Anonymity and confidentiality have been guaranteed by data coding and they have the right to withdraw at any time.

II. Operational design

The operational design includes preparatory phase, pilot study, and field work.

Preparatory phase:

This phase started with a review of current and past, national and international related literature concerning the subjects of the study, using textbooks, articles, journals, and websites. This review was helpful to the investigator in reviewing and developing the data collection tools, and then the investigator tested the validity of the tool through jury of expertise to test the content, knowledge, accuracy, and relevance of questions for tools.

Pilot Study:

A pilot study was conduct on all adolescents at nursing secondary schools in the village of barout and Tzimant at Beni-Suef City, to assess the applicability, efficiency, and clarity of the tools, to assess the feasibility of fieldwork, and to uncover any obstacles that the researcher may encounter and interfere with the data collection. The necessary modifications were made based on the results of the pilot study, such as (deleting or adding some questions from the tool) in order to strengthen its contents or for more simplicity and clarity. The experimental sample was excluded from the main study sample.

Field work:

Data collection for the study takes six months. The study data collection began at the beginning of October 2022, and ended at the end of March 2023. The researcher attended a nursing school for boys in Barot and a nursing school for girls in Tazmant, Beni Suef Governorate, two days a week from. From 9 am to 2 pm. At the beginning, the researcher explained the purpose of the study to the students and reassured them that the collected information is strictly confidential and that it is used only for the purpose of the research. An interview questionnaire sheet was filled out and completed by the participants and returned within 15:20 minutes.

III. Administrative design:

Approval to conduct this study was obtained from the dean of the Faculty of Nursing, Beni Suef University, and official permission was obtained from the director of training and schools department at the directorate of health and population in Beni Suef regarding adolescents enrolled in schools of nursing for whom the study was conducted.

IV. Statistical design:

Data analysis of the collected information was performed with the help of a statistical package for social sciences (SPSS) software version 26. The variables were analyzed descriptively where continuous variables were analyzed and presented using means and standard deviations. Qualitative variables were compared using qui square test (X^2) as the test of significance, independent (t) test were used to compare mean score between two and more groups respectively. The p-value is the degree of significant. A significant level value was considered when p-value ≤ 0.05 and a highly significant level value was considered when p-value ≤ 0.001, while p-value > 0.05 indicates non-significant results.

Results:

Table 1; revealed that studied students 59.0% had age from 15-<17 years old, with mean±SD of 16.59±1.21, and 63.9% of them were female. In addition, 84.6% of them lived at rural residence, and 63.9% were from female nursing school.

Table 2; revealed that 53.3% of the studied students had less than five family members, 54.2 of their father and mothers had a secondary education respectively, and 45.8% of their father work at governmental job. In addition, 70.9% of studied student's mothers were housewives, 58.6% of them had inadequate family income and 88.1% of them live with their parents.

Table 3; revealed that there was a highly statistical significant difference between body mass index and the gender of the studied students, as 30.5% of the studied male students had underweight body mass index, and 61.0% of them had a normal body mass index. On the other hand 53.1% of the studied female students had a normal body mass index and, 37.9% of them had an overweight body mass index.

Table 4; revealed that 72.7% of the studied students had a correct answer about the importance of physical activities as, it improves the metabolism leading to weight loss and preventing diseases like diabetes, and heart disease, decreasing blood pressure, and manages and prevent noncommunicable diseases like diabetes, heart disease, stroke, and a number of cancers. Furthermore 43.2% of the studied students had incorrect answers regarding that Physical activity increases the release of endorphins which is a Happy hormone that improves the mood thus making the person happier and joyful.

Figure 1; illustrates that 38.30% of the studied students had a good level of knowledge score, and 31.7% of them had a poor level of knowledge score.

Table 5; revealed that there was a significant difference between male and female students' physical activities practice times, as male students practice the following physical activities more than female; cycling, jumbling, and climbing. on the other hand, the female student practice walking physical activity more than male students.

Figure 2; illustrated that 66.5% of the studied students are physically inactive, while 33.5% of them are physically active.

Figure 3; illustrated that 66.90% of the studied students had a positive emotional and behavioral attributes, and 33.10% of them had a negative emotional and behavioral attributes.

Table 6; revealed that there was a highly statistical significant relation between studied students gender and their physically activity score as the male students were found to have a high level of physical activity score more than female students ($p< 0.001$**). Also there was a statistical significant relation between studied students age and their total physical activities score ($p<0.05$*). Moreover, there was no statistical significant relation between studied students' residence and their total physical activities score.

Table 7; revealed that there was a highly statistical significant relation between studied students age and gender and their emotional and behavioral attributes score as the male students were found to have a positive emotional and behavioral attributes score more than female students ($p< 0.001$**). Moreover, there was no statistical significant relation between studied students' residence and their total emotional and behavioral attributes score.

Table 8; revealed that there was a highly statistical significant relation between studied students father and mothers' education and occupation and their total emotional and behavioral attributes score ($p<0.001$**). Also there was a statistical significant relation between studied students' family income and their total emotional and behavioral attributes score. Moreover, there was no statistical significant relation between studied students' number of family members and people who living with and their total emotional and behavioral attributes score.

Table 9; revealed that there was a highly positive association between studied students' total knowledge, physical activities and their emotional and behavioral attributes, that means increase student awareness regarding importance of physical activity will positively affect their practice toward physical activities and improve their emotional and behavioral changes.

Table (1): Frequency distribution of personnel characteristics of the studied students (n=227).

Personnel characteristics	No	%
Age in years		
15-<17	134	59.0
17-<19	86	37.9
≥ 19 years old	7	3.1
Mean ±SD	16.59±1.21	
Gender		
Male	82	36.1
Female	145	63.9
Residence		
Rural	192	84.6
Urban	35	15.4
Nursing school		
Male nursing school	82	36.1
Female nursing school	145	63.9

Table (2): Frequency distribution of family history of the studied students (n= 227)

Family history	No	%
Number of family members		
Less than 5 members	121	53.3
≥ 5 members	106	46.7
Father educational level		
Illiterate	19	8.4
Read and write	21	9.3
Secondary education	123	54.2
University education secondary education	51	22.5
Postgraduate	13	5.7
Mother educational level		
Illiterate	41	18.1
Read and write	19	8.4
Secondary education	123	54.2
University education	39	17.2
Postgraduate	5	2.2
Father occupation		
Governmental job	104	45.8
Nongovernmental job	76	33.5
Not work	22	9.7
Others	25	11.0
Mother occupation		
Governmental job	52	22.9
Nongovernmental job	11	4.8
House wife	161	70.9
Others	3	1.3
Family income		
Not enough	133	58.6
Enough	17	7.5
Enough and safe	77	33.9
People living with		
Parents	200	88.1
One of parents	19	8.4
Grandpa and grand ma	8	3.5

Table (3): Frequency distribution of body mass index of the studied students (N = 227)

Body mass index	Male		Female		Chi square	P value
	No	%	No	%		
Under weight	25	30.5%	13	9.0%	31.64	<0.001**
Normal	50	61.0%	77	53.1%		
Overweight	7	8.5%	55	37.9%		

** Highly statistical significant difference.

Table (4): Frequency distribution of studied student knowledge regarding importance of physical activities.

Knowledge	Correct		Incorrect	
	No	%	No	%
Provide a very good opportunity to release and replenish energies.	154	67.8	73	32.2
Physical activity increases muscle fitness and cardiorespiratory fitness	144	63.4	83	36.6
Improve memory and enhance academic performance	138	60.8	89	39.2
Physical activity increases the release of endorphins which is a Happy hormone that improves the mood thus making the person happier and joyful.	129	56.8	98	43.2
Improves the metabolism leading to weight loss and preventing diseases like diabetes, and heart disease, decreasing blood pressure	165	72.7	62	27.3
Manage and prevent noncommunicable diseases like diabetes, heart disease, stroke, and a number of cancers.	165	72.7	62	27.3

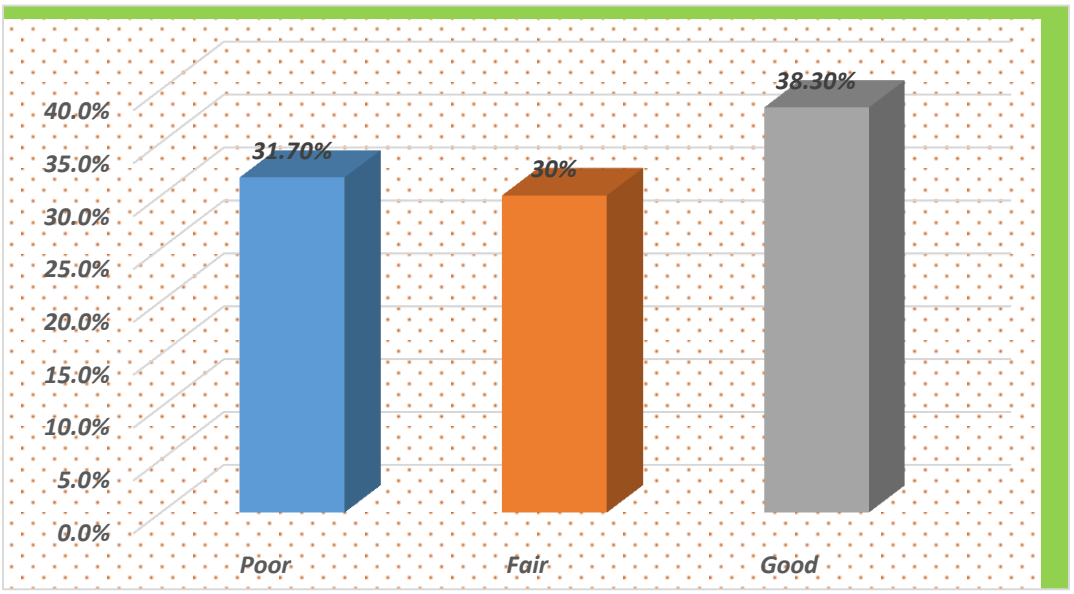

Figure (1): Percentage distribution of total knowledge score of the studied students

Table (5): Frequency distribution of studied students' physical activity practice times (n=227).

Physical activities	Male student Mean ± SD	Female students Mean ± SD	Independent t test	P value
Aerobic activities				
Cycling	2.3659±1.79514	1.8138±1.69143	2.27	<0.05*
Walking	2.5366±1.71554	3.0207±1.03728	2.33	<0.05*
Running	1.9268±1.62375	1.9103±1.40889	0.077	>0.05
Swimming	.4878±.70700	.5310±.77330	0.428	>0.05
Dancing	2.0732±1.51356	2.0690±2.09714	0.475	>0.05
Muscles strengthens activities				
Jumbling	2.2805±1.39907	2.1793±1.76253	2.97	<0.05*
Climbing	1.0366±.92222	.6690±.84208	2.38	<0.05*
Gymnastic	1.8293±.99138	1.4897±1.09365	0.501	>0.05
Sedentary activities				
Television viewing	3.2683±1.25756	3.3517±1.10887	1.50	>0.05
Computer	3.6829±1.09857	3.4621±1.09937	1.45	>0.05
Telephone use	3.6341±1.10568	3.4069±1.07688	0.410	>0.05
Video games	3.8171±1.16670	3.8759±.95658	1.07	>0.05

*Statistical significant difference.

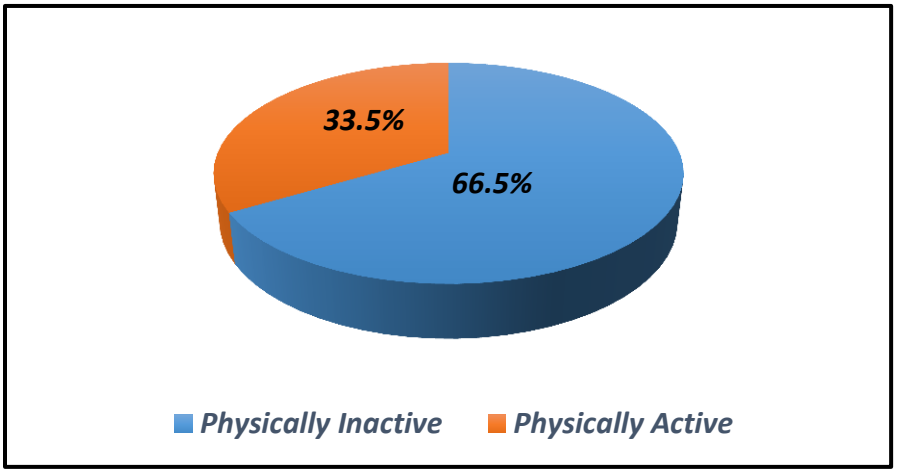

Figure (2): Percentage distribution of total physical activity score of the studied students.

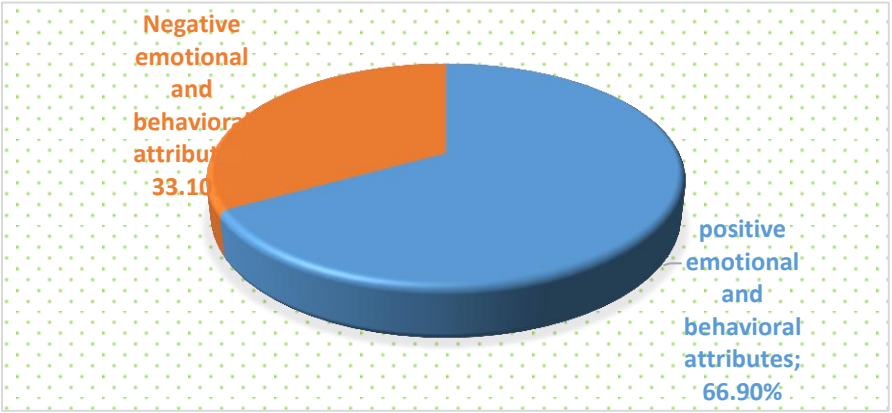

Figure (3): Percentage distribution of total emotional and behavioral changes score of the studied students.

Table (6): Relationship between total physical activity score and personnel characteristics of the studied students (n= 227).

	Total physical activity score				Chi square	P value
	Physically inactive		Physically active			
	No	%	No	%		
Age in years					7.12	<0.05*
15-<17	80	53.0%	54	71.1%		
17-<19	65	43.0%	21	27.6%		
≥ 19 years old	6	4.0%	1	1.3%		
Gender					69.85	<0.001**
Male	26	17.2%	56	73.7%		
Female	125	82.8%	20	26.3%		
Residence					0.012	>0.05
Rural	128	84.8%	64	84.2%		
Urban	23	15.2%	12	15.8%		
Nursing school					69.85	<0.001**
	26	17.2%	56	73.7%		
	125	82.8%	20	26.3%		

*Statistical significant difference

** Highly statistical significant difference

Table (7): Relationship between total emotional and behavioral changes score and personnel characteristics of the studied students (n= 227).

	Total emotional and behavioral attribute score				Chi square	P value
	Negative emotional and behavioral attribute		Positive emotional and behavioral attribute			
	No	%	No	%		
Age in years					16.00	<0.001**
15-<17	51	68.0%	83	54.6%		
17-<19	18	24.0%	68	44.7%		
≥ 19 years old	6	8.0%	1	0.7%		
Gender					50.09	<0.001**
Male	3	4.0%	79	52.0%		
Female	72	96.0%	73	48.0%		
Residence					1.93	>0.05
Rural	67	89.3%	125	82.2%		
Urban	8	10.7%	27	17.8%		
Nursing school					50.09	<0.001**
	3	4.0%	79	52.0%		
	72	96.0%	73	48.0%		

** Highly statistical significant difference

Table (8): Relationship between total emotional and behavioral changes score and family history (n= 227).

Family history	Total emotional and behavioral attribute score				Chi square	P value
	Negative emotional and behavioral attribute		Positive emotional and behavioral attribute			
	No	%	No	%		
Number of family members						
Less than 5 members	38	50.7%	83	54.6%	0.313	>0.05
≥ 5 members	37	49.3%	69	45.4%		
Father educational level						
Illiterate	19	25.3%	0	0.0%	113.81	<0.001**
Read and write	21	28.0%	0	0.0%		
Secondary education	35	46.7%	88	57.9%		
University education	0	0.0%	51	33.6%		
Postgraduate	0	0.0%	13	8.6%		
Mother educational level						
Illiterate	41	54.7%	0	0.0%	167.46	<0.001**
Read and write	19	25.3%	0	0.0%		
Secondary education	15	20.0%	108	71.1%		
University education	0	0.0%	39	25.7%		
Postgraduate	0	0.0%	5	3.2%		
Father occupation						
Governmental job	75	100.0%	29	19.1%	132.46	<0.001**
Nongovernmental job	0	0.0%	76	50.0%		
Not work	0	0.0%	22	14.5%		
Others	0	0.0%	25	16.4%		
Mother occupation						
Governmental job	52	69.3%	0	0.0%	178.60	<0.001**
Nongovernmental job	11	14.7%	0	0.0%		
House wife	12	16.0%	149	98.0%		
Others	0	0.0%	3	2.0%		
Family income						
Not enough	51	68.0%	82	53.9%	7.71	<0.05*
Enough	1	1.3%	16	10.5%		
Enough and safe	23	30.7%	54	35.5%		
People living with						
Parents	70	93.3%	130	85.5%	3.10	>0.05
One of parents	4	5.3%	15	9.9%		
Grandpa and grand ma	1	1.3%	7	4.6%		

*Statistical significant difference ** Highly statistical significant difference

Table (9): Correlation among total emotional and behavioral changes score, total physical activity and total emotional and behavioral scores.

Variables		Knowledge	Total physical activity score	Emotional and behavioral attribute score
Knowledge	Pearson Correlation	1	.794**	.864**
	Sig. (2-tailed)		.000	.000
Total physical activity score	Pearson Correlation	.794**	1	.498**
	Sig. (2-tailed)	.000		.000
Emotional and behavioral attribute score	Pearson Correlation	.864**	.498**	1
	Sig. (2-tailed)	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).
** Highly statistically significant correlations (P< 0.001)

Discussion

Adolescence is a transitional phase of growth and development between childhood and adulthood. WHO defines an adolescent as any person between ages 10 and 19. Many changes take place during adolescence. Prominent among these are physical changes, including puberty, and social and psychological changes, with development of reasoning skills, rational thought, and moral judgment **(González-Cabrera et al., 2022).**

According to the United Nations definitions of different groups of young people, 'adolescents' are those between 10 and 19 years old and 'youth' includes everybody between 15 and 24 years old. More than 1.5 billion people in the world are between the ages of 10 and 25. Egypt's young population is rapidly growing. The adolescents (aged 10-19) are around 17 million, representing approximately 19 percent of the total population. Together with youth in the age group 20-24 years, an additional 9 million, adolescents and youth represent almost one third of the Egyptian population **(Zaazou et al., 2023).**

United Nations Fund for Population Activities (UNFPA) promotes and protects the rights of young people. It envisions a world in which girls and boys have optimal opportunities to develop their full potential, to freely express themselves and have their views respected, and to live free of poverty, discrimination and violence. To achieve this, UNFPA works across sectors and with many partners to: Empower adolescents and youth with skills to achieve their dreams, think critically, and express themselves freely; Promote health education, commodities and services Connect young people to livelihood and employment programs Uphold the rights of young people, especially girls and marginalized groups **(*Thomas* et al., 2023).**

So, the current study aimed to assess for physical activity, behavioral and emotional changes among adolescents. The study indicates that more than one third 38.30% of the studied students had a good level of knowledge, illustrated that less than two thirds 66.5% of the studied students are physically inactive, while more than one third 33.5% of them are physically active**,** and more than two thirds 66.90 % of the studied students had a positive emotional and behavioral attributes, and less than one third 33.10% of them had a negative emotional and behavioral attributes**.**

Regarding to age of the studied students, the results of the current study revealed that, more than half of studied students had age from 15-<17 years old. These results were approved with ***Gut0hold et al.,* (2020),** who studied of "Global trends in insufficient physical activity among adolescents" in 146 countries, territories, and areas at the Global level (n=298), who found that more than half of studied students were aged ranged from 15-17 years old**.**

Regarding to gender of the studied students, the results of the current study revealed that, nearly two third of them were female. These results were incongruence with ***Uddin et al., (2019),*** who studied "Suicidal ideation, suicide planning, and suicide attempts among adolescents" in 59 low-income and middle-income countries (n=229), who found that more than half of studied students were female. **From the investigator's point of view**, these

results might be due to the highest percent of the students in nursing school being females and the lowest percent being males**.**

Regarding to residence of studied students, the results of the current study showed that, the majority of them of them lived at rural residence. These results were similar to ***Azmawati et al., (2020),*** who studied "Risk taking behavior among urban and rural adolescents" in Malaysia (n=306), who reported that the majority of studied students were living in rural areas. **From the investigator's point of view**, these results might be associated with the increase in birth rate in rural areas more than in urban areas**.**

Pertaining to family members of studied students, the results of the current study showed that more than half of the studied students had less than five family members. More than half of their father and mothers had a secondary education respectively and less than half of their father work at governmental job. In addition, less than three quarters of studied student's mothers were housewives, more than half of them had inadequate family income and the majority of them live with their parents.

These results were in the same line with **Bryer, Cherkis, Raman, J. (2020),** who studied " Health-Promotion Behaviors of Undergraduate nursing Students: A Survey Analysis"in Sudan (n= 190), who reported that more than half of the sample had family members from 3- 4 member and their families had inadequate income.

These results were indifference with **Hawker, (2019),** who studied "Physical activity and mental well-being in student nurses. Nurse Education Today" in South Africa (n= 215), who found that less than half of the studied sample their parents were educated and their father was pensioner.

Regarding to body mass index of studied students, the results of the current study showed that there was a highly statistical significant difference between body mass index and the gender of the studied students, as more than one third of the studied male students had underweight body mass index, and less than two third of them had a normal body mass index. On the other hand more than half of the studied female students had a normal body mass index and more than one third of them had an overweight body mass index **(Table 3)**.

These results were supported by ***Gualdi-Russo* et al.*, (2022).*** who studied " Physical Activity and Body Image Perception in Adolescents" in Kuwait (n=296), who reported that highly statistical significant difference between body mass index and the gender of the studied students, as more than one third of the studied male students had underweight body mass index, and more than half of them had a normal body mass index. On the other hand less than two third of the studied female students had a normal body mass index and more than one third of them had an overweight body mass index. **From the investigator's point of view**, this result may be due to male students had testosterone which creates leaner muscle mass and less body fat than estrogen **(Table 3).**

Concerning to knowledge about importance of physical activities of studied students, the results of the current study showed that less than three quarters of the studied students had a correct answer about the importance of physical activities as, it improves the metabolism leading to weight loss and preventing diseases like diabetes, and heart disease, decreasing blood pressure, and manages and prevent non communicable diseases like diabetes, heart disease, stroke, and a number of cancers. Furthermore that less than half of the studied students had incorrect answers regarding that Physical activity increases the release of endorphins which is a Happy hormone that improves the mood thus making the person happier and joyful**.**

These results were supported by ***Kgokong & Parker, (2020),*** who studied " Physical activity in physiotherapy students: Levels of physical activity and perceived benefits and barriers to exercise" in the Western Cape province of South Africa. (n=269), who reported that higher scores indicate more perceived benefits to exercise. In terms of perceived benefits from participating in PA, the participants had the highest agreement for the domains of 'physical performance' and 'psychological outlook'.

From the investigator's point of view, these results may be due to students were careful on attendance physical activity that help them to improves the metabolism leading to weight loss and preventing diseases like diabetes, and heart disease, decreasing blood pressure, and manages and prevent non communicable diseases like diabetes, heart disease, stroke, and a number of cancers.

Regarding to physical activity practice times of studied students, the results of the current study showed that, male students practice the following physical activities more than female as cycling, jumbling, and climbing on the other hand, the female student practice walking physical activity more than male students.

These results were supported by **Zanotti, (2018)**, who studied "Categorization and determinants of physical activity among nursing students " in California (n= 173), who reported that male students perform activities like climbing and cycling more than females, meanwhile females perform activities like walking more than males.

From the investigator's point of view, these results might be due to many factors such as females had been shown to participate less in organized sports, sex difference which affects value and meaningfulness, gender appropriateness and perceived competence.

Conversely, this result was in disagreement with **Hosseini et al., (2018)** who conducted a study entitled" Health-Promoting Behaviors and Their Association With Certain Demographic Characteristics of Nursing Students of Tehran City in 2013" (n= 65) and illustrated that male students do physical activities like walking more than female students. This variation may be due to sample size and place selection.

In relation to emotional and behavioral changes of studied students, the results of the current study showed that there was no statistical significant difference between studied male and female students, whereas less than half of male students and less than half of female students had a correct answer about feeling overly sensitive as Are you conscious about losing your weight?, and more than one third for male and less than one third for female about Have you thought of building your muscles?, also there was no statistical significant difference between male and female students about correct answer regarding looking for identity, feeling uncertain, conflict in thoughts and mood swings.

These results were supported by ***Rajan, et al., (2018).*** Who studied " Behavioral and Emotional Changes among adolescents" in India (n= 450), who reported that more than one third regarding Feeling Overly Sensitive about losing weight and less than half building muscles, also students had a correct answer about looking for identity, feeling uncertain, conflict in thoughts and mood swings.

From the investigator's point of view, this result may be due to adolescence is a time to develop knowledge and skills, learn to manage emotions and relationships, and acquire attributes and abilities that will be important for enjoying the adolescent years and assuming adult roles.

Concerning relation between total knowledge score and personnel characteristics, the result of the current study showed that, there was a highly statistical significant relation between studied students gender and their total knowledge score as the female students were found to have a high level of knowledge more than male students ($p< 0.001$**). Also there was a statistical significant relation between studied students age and their total knowledge score ($p<0.05$*). Moreover, there was no statistical significant relation between studied students' residence and their total knowledge score**.**

These results were agreed with **Brogan et al., (2021)** who studied "Healthy eating and physical activity among new graduate nurses: a qualitative study of barriers and enablers during their first year of clinical practice" in Australia (n= 11000) and indicated that the female nurses were found to have a high level of knowledge more than male nurses ($p< 0.001$**). Also there was a statistical significant relation between studied nurses age and their total knowledge score ($p<0.05$*).

From the investigator point of view, this result may be due to female students are more

intelligent than males as they had the desire to acquire knowledge and understand how things in the world operate.

These results were dissimilar to **Barth Vedoy et al., (2020)** who studied "Physical activity, mental health and academic achievement" in Norwege (n= 235) and cleared that there was a statistical significant relation between studied students' residence and their total knowledge score.

Regarding the relation between total knowledge score and family history of the studied students, the present study clarified that there was a statistical significant relation between studied students father and mothers' education and occupation and their total knowledge score ($p<0.05$*). Moreover, there was no statistical significant relation between studied students' number of family members, family income and people who living with and their total knowledge score**.**

These results were similar to **Belcher et al., (2021)** who studied" The Roles of Physical Activity, Exercise, and Fitness in Promoting Resilience During Adolescence: Effects on Mental Well-Being and Brain Development" in USA (n= 120) and illustrated that there was a statistical significant relation between studied students father and mothers' education and occupation and their total knowledge score ($p<0.05$*). Moreover, there was no statistical significant relation between studied students' number of family members and their total knowledge score.

From the investigator point of view, this result may be due to learning and knowledge is easy to be carried when obtained from educated parents as adolescents appreciate their parents as they are the role models.

Regarding to the relation between total physical activity score and personnel characteristics of the studied students, the current study showed that there was a highly statistical significant relation between studied students gender and their physically activity score as the male students were found to have a high level of physical activity score more than female students ($p< 0.001$**). Also there was a statistical significant relation between studied students age and their total physical activities score ($p<0.05$*). Moreover, there was no statistical significant relation between studied students' residence and their total physical activities score**.**

These findings agreed with **Biddle et al., (2019)** who studied" Physical activity and mental health in children and adolescents" in Canada (n= 370) and found that that there was a highly statistical significant relation between studied students gender and their physically activity score as the male students were found to have a high level of physical activity score more than female students ($p< 0.001$**).

These results were also in the same line with **Chow, & Choi, (2019)** who studied" the Mental Health, Physical Activity Levels, and Resilience of Today's Junior College Students in Self-Financing Institutions" in Mali (n= 194) and concluded that there was a statistical significant relation between studied students age and their total physical activities score ($p<0.05$*) and there was no statistical significant relation between studied students' residence and their total physical activities score.

Concerning the relation between total physical activity score and family history, the results of the current study proved that there was a highly statistical significant relation between studied students father and mothers' education and occupation and their total physical activity score ($p<0.001$**). Moreover, there was no statistical significant relation between studied students' number of family members, family income and people who living with and their physical activities score**.**

These results were in similarity with the study conducted by **Newtonraj et al., (2019)** entitled" Level of insufficient physical activity among adults" in a rural area of South India (n= 475) and found that there was a highly statistical significant relation between studied students father and mothers' education and occupation and their total physical activity score.

Moreover, these results were supported by **Oyeyemi et al., (2018)** who studied" Patterns of objectively assessed physical activity and sedentary time" in Nigeria (n= 110) and cleared that there was no statistical significant relation

between studied students' number of family members, family income and people who living with and their physical activities score.

From the investigator's point of view, these results may be due to educated parents had the knowledge of importance and benefits of performing physical activities so they encourage their sons to maintain daily physical activities.

Concerning the relation between total emotional and behavioral changes score and personnel characteristics of the studied students, the results of the present study illustrated that there was a highly statistical significant relation between studied students age and gender and their emotional and behavioral attributes score as the male students were found to have a positive emotional and behavioral attributes score more than female students ($p< 0.001$**). Moreover, there was no statistical significant relation between studied students' residence and their total emotional and behavioral attributes score**.**

These results weren't in similarity with the study conducted by **Bell et al., (2019)** who studied" The relationship between physical activity, mental wellbeing and symptoms of mental health disorder in adolescents: a cohort study" in South Africa (n= 548) and showed that female students were found to have a positive emotional and behavioral attributes score more than male students.

In relation to relationship between total emotional and behavioral changes score and family history, the current study revealed that there was a highly statistical significant relation between studied students father and mothers' education and occupation and their total emotional and behavioral attributes score ($p<0.001$**). Also there was a statistical significant relation between studied students' family income and their total emotional and behavioral attributes score. Moreover, there was no statistical significant relation between studied students' number of family members and people who living with and their total emotional and behavioral attributes score.

These results were in the same line with **Caputo, (2018)** who studied" Social desirability bias in self-reported well-being measures: evidence from an online survey" in Spain (n=784) and stated that there was a highly statistical significant relation between studied students parents' education and occupation and their total emotional and behavioral attributes score ($p<0.001$**). Also there was a statistical significant relation between studied students' family income and their total emotional and behavioral attributes score.

Also, these results were supported by **Costigan et al., (2019)** who studied" Associations between physical activity intensity and well-being in adolescents. *Preventive Medicine*" in England (n= 130) and revealed that there was a highly statistical significant relation between studied students father and mothers' education and occupation and their total emotional and behavioral attributes score and there was no statistical significant relation between studied students' number of family members and people who living with and their total emotional and behavioral attributes score.

The current study showed that there was a highly positive association between studied students' total knowledge, physical activities and their emotional and behavioral attributes that means increase student awareness regarding importance of physical activity will positively affect their practice toward physical activities and improve their emotional and behavioral changes (Table 13).

These findings were supported by **Inchely et al., (2020)** who studied" Spotlight on adolescent health and well-being. Findings from the 2017/2018 Health Behavior in School-aged Children" in Europa and Canada (n= 2875) and indicated that there was a highly positive association between studied students' total knowledge, physical activities and their emotional and behavioral attributes that means increase student awareness regarding importance of physical activity will positively affect their practice toward physical activities and improve their emotional and behavioral changes.

Also, **McMahon et al., (2018)** who studied" Physical activity in European adolescents and associations with anxiety, depression and well-being" in Europe (n= 540)

and mentioned that the increase in student awareness regarding importance of physical activity will positively affect their practice toward physical activities and improve their emotional and behavioral changes.

Conclusion

Based on the results of the present study and Research question, the researcher can conclude that, the mean age ± SD of studied students is 16.59±1.21. There was less than one third of them had a poor level of knowledge regarding importance of physically activity and less than two thirds of them are physically inactive. Beside that less than one third of them had a negative emotional and behavioral attributes. Finally, there was a highly positive association between studied students' total knowledge, physical activities and their emotional and behavioral attributes.

Recommendations

Based on the previous results of the present study and conclusion, the following recommendations are suggested:

- Regular training program for adolescents to improve their knowledge regarding physical, behavioral and emotional changes.
- Increase awareness of students about importance of physical activity.

In further research:

- Future studies in different cultural settings will shed light on how behavioural and emotion regulation in adolescence is influenced by different social expectations regarding age, gender, family dynamics, and academic level.
- Replication of study using large study sample in different correction settings to generalize the results.
- Additionally, using standardized study methods to conduct future research should make it possible to pool individual study data, which may be necessary to obtain precise estimates for assessing physical activity, behavioural and emotional changes among adolescent.

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