Prevalence and Disability Induced by Acne Vulgaris among Adolescent Students at Secondary Schools in Assiut City

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Abstract

Background: Acne vulgaris is one of the commonest skin disorders which dermatologists have to treat, mainly affect adolescents. It has been found to have a significant impact on their psychological status, **The study aimed** to identify the prevalence of acne vulgaris among adolescents students and the disability induced by acne vulgaris on them .**Subjects and methods**: descriptive research cross sectional design was used. It was conducted in four secondary schools at Assiut city .The total study sample was 1026 students which was selected randomly. The study included two tools: first tool was self-administered structure questionnaire, which included two parts, first part was some demographic data of studied students and the second part was about acne vulgaris. The second tool was Acne Disability Index. **Results:** It was found that 67% of the studied students were female and the mean age ±SD was 16.37 ±1.18. The prevalence of acne in studied students was 60.5%. Also, 63.3% of studied adolescent students had mild disability effect **Conclusion:** Acne vulgaris is more prevalent among studied students .There was statistically significant difference between Acne Disability Index and students' age and more than three fifths of studied adolescent students had mild disability effect from acne **Recommendations:** school health nurses should be attended the educational programs about acne because they are most contact and deal with the students.

Keywords: Acne vulgaris, Prevalence & Disability.

Introduction

Acne vulgaris is considered a major problem of adolescents. It is easily recognizable and well known. Also it is physiological process but it is considered a disease due to its inflammatory process. It results in disfigurement on the face, which is psychologically and socially the most important site in the body. This disfigurement results in a greater psychological problem than other chronic diseases (**Hinge et al., 2014)**.

Acne vulgaris is a long term skin condition presented by shapes of blackheads, whiteheads, pimples, greasy skin and scars may be formed. Moreover, it is a disorder of the hair follicles in the face, chest, and back that affects almost all males and females during puberty. It is not caused by bacteria, although bacteria play a role in its development **(Kartheepan et al., 2015).**

Acne may be known as hormonal acne because of testosterone hormone which is considered one of a major causative factor. During puberty testosterone levels increased. This hormone causes male development in boys and gives muscle and bone strength in girls. The hormone cause increase sebum production of hair follicles. This is because the glands that secrete the oil are sensitive to testosterone. Also hormonal changes during pregnancy or the menstrual cycle can also trigger acne **(Bettoli et al., 2015).**

Acne is associated with psychological problems There is no single disease which causes more psychological problems, more maladjustment between parents and children, more feeling of insecurity and feeling of inferiority and greater sums of psychological suffering than does acne vulgaris. Although patients with acne are not affected in terms of general health status, morbidity, or life span **(Al-Shidhani et al., 2015).**

Adolescent stage is a complex life cycle characterized by many biological, psychological, physical and social changes. It is a labile stage where development of self-esteem occurs. During late adolescence high self-esteem is especially significant, when major life choices are made . Experiencing high self-esteem serves as a protective factor in coping with new life changes. Whereas low self-esteem which accompanied by acne is associated with anxiety, depression, and increased reports of general psychiatric problems **(Alharithy, 2011).**

Worldwide, the prevalence of acne vulgaris is high. Community-based studies conducted within the last decade have reported prevalence rates from 49.8% to 93.2%. Acne vulgaris occurs in all ethnicities and races, and mainly affects adolescents **(Global Burden of Diseases, 2013).**

Acne prevention measures dependent on the successful management of modifiable risk factors, such as underlying systemic diseases and lifestyle factors. There are several treatments are available for acne, but guidelines suffer from a lack of data to make evidence-based recommendations. In addition, the complex combination treatment needed to target different aspects of acne pathophysiology lead to poor adherence, which undermines treatment success **(Tuchayi et al., 2015).**

The school nurse provides health education by providing health information to individual students and groups of students through health education, science, and other classes. The school nurse assists on health education curriculum development teams and may also provide programs for staff, families, and the community **(American Academy of Pediatric , 2016).**

Significant of the study

Acne vulgaris is often misunderstood as a simple puberty related condition by common people and even medical community, while scientific evidence revealed that acne effects patients more than a simple dermatologic disease. It has been observed that social and psychological impacts of acne are sometimes so complicated that cause serious problems in patients' body image, self-esteem, and socialization and even may lead to feel of anger **(Safizadeh et al,2012).**

In Egypt, detailed studies on the magnitude of the problem regarding prevalence, sex distribution, probable associated risk factors and treatment patterns are lacking. The prevalence of acne vulgaris in the study conducted by **El-Khateeb et al, 2014** under the title of prevalence, beliefs, patients' attitudes, severity and impact on quality of life in Egypt reported that the prevalence of acne among the sample was 54.2%.

Aim of the study

To identify the prevalence of acne vulgaris among adolescents students and the disability induced by acne vulgaris on them.

Research questions:

1. What is the prevalence of acne vulgaris among adolescent students?
2. Is acne vulgaris has disability effect on adolescent students?

Subjects & method

Research design

Descriptive research, cross sectional design was used in this study.

Setting of the study

The study was carried out in four secondary schools, El Moushir Ahmed Ismail secondary school for boys, El Khayat secondary school for girls and Tahrir language school for boys and girls and Abd El Moneim Riad commercial secondary school at Assiut city, which were selected randomly.

Sampling

Multi stage random sample was used in this study, Assiut city includes 29 secondary schools, 12 general governmental secondary schools and 17 technical secondary schools, four schools were selected randomly. The sample was detected by taking 25% from the total number of each school, which was selected randomly.

School name	Total number of students	*Percentage of sample	Studied students
El Moushir Ahmed Ismail secondary School	1104	26.88 %	276
El Khayat Secondary School For Girls	1218	29.66 %	304
Tahrir Language School	134	3.26 %	33
Abdel Moneim Riad Commercial secondary School	1650	40.20 %	413
Total	4106	100 %	1026

***** Percentage of sample according to total number of students in each school

After calculation the sample was 1026 adolescent students who subjected for assessment. It was observed that 621 students out of the previous total number of studied sample (1026 students) had acne vulgaris.

Tools of the study: The study was included two tools.

Tool I

Self-administered questionnaire was developed by the research team for data collection. It was based on review of relevant literatures. This questionnaire was included two parts, the first part included some demographic characteristics of adolescent students as (age, sex, academic year, fathers' education, fathers' occupation, mothers' education, mothers' occupation) The second part was about acne vulgaris as having acne , medical history such as family history of acne vulgaris and number of family members affected by acne vulgaris , duration , places , symptoms and treatment of acne vulgaris**.**

Tool II

The Cardiff Acne vulgaris Disability Index (CADI).It is a disease-specific questionnaire measuring disability induced by acne vulgaris.

It was comprised of five questions. The first four questions were related to the feelings of aggression, frustration, interference with social life, avoidance of public changing facilities and appearance of skin. Fifth question gave indication of how bad the acne vulgaris was .

Scoring system

The response to each of five questions was scored from 0 to 3, with a total maximum score of 15 grades, a minimum score of 0 grade. The higher score meaned that more impaired in affected individuals.

- 0-5 translated to mild effect
- 6-10 indicated moderate effect
- 11-15 demonstrated severe effect **(Yap ,2012& Law et al., 2009).**

Validity of the tools:

The tools were transferred to Arabic language and reviewed to ascertain their validity by seven experts in medical and nursing sciences, who reviewed the instrument for clarity, relevance, comprehensiveness, understanding and applicability

Reliability: Reliability of tool II was assessed using alpha-cron-bach test to test the internal consistency r1 =0.8543.

Ethical considerations

The students were recruited to the study informed about the objectives of the study and they are free to refuse participation. A verbal consent obtained from the students. Confidentiality of obtained information was assured as the obtained information was used only for the purpose of the study.

Pilot study

Pilot study was carried out before starting of data collection on 10% of adolescent students; who included in the sample. It aimed to test the clarity of the tools and estimate the required time to fill the questionnaire.

Field work

The data was collected from October 2014 to the end of December 2014.The assessment was done for 1026 adolescent students. While disability of acne was measured with the Acne Disability index which was done for 621 adolescent students who had acne.

The researcher met the students in their classes. Self-administered questionnaire filled by the students themselves. The researcher was presented during filling the questionnaire to answer any questions and for further explanation on the questionnaire. The duration was (20-30) minutes which is the time of each school period . The data was collected in (two day/ week).At each school the pre calculation percentage of students were met .

The data collection was taken three months .Every week about (80-90) sheets were finished .The researcher begin with Tahrir Language School and when finished went to others schools and finished by Abdel Moneim Riad Commercial secondary school. There was variation in time between schools according the schedule of each one and available time. The researcher began data entry after data collection at the end of December 2014.

Statistical Analysis

The data obtained were reviewed, prepared for computer entry, coded, analyzed and tabulated to evaluate the differences between the groups under the study. Descriptive statistics (i.e., frequencies, mean and standard deviation) was done using computer program SPSS version 19. Chi-square test was used. The test is considered significant when P-values were less than 0.05 or ($P< 0.05$).

Results

Table (1):Distribution of the studied adolescent students regarding to their demographic characteristics in Assiut city, 2015 n=(1026).

Items	No (n= 1026)	%
School type		
General secondary school	612	59.6
Secondary technical school	414	40.4
Adolescent students' age		
15 – 16 years	617	60.1
> 16 years	409	39.9
Mean ± SD (Range)	16.37 ± 1.18 (15.0 – 20.0)	
Adolescent students' sex		
Male	339	33.0
Female	687	67.0
Academic years		
First	493	48.1
Second	297	28.9
Third	145	14.1
Fourth	49	11.8
Fifth	42	10.1
Fathers' education		
Illiterate	19	1.9
Read & write	83	8.1
Basic education	104	10.1
Secondary	273	26.6
University or more	547	53.3
Fathers' occupation		
Farmer	28	2.7
Worker	120	11.7
Technical worker	116	11.3
Free business	85	8.3
Governmental employee	565	55.1
Retired	56	5.5
Unemployed	33	3.2
Died	23	2.2
Mothers' education		
Illiterate	55	5.4
Read & write	73	7.1
Basic education	90	8.8
Secondary	345	33.6
University or more	463	45.1
Mothers' occupation		
Working	404	39.4
Housewife	620	60.4
Died	2	0.2

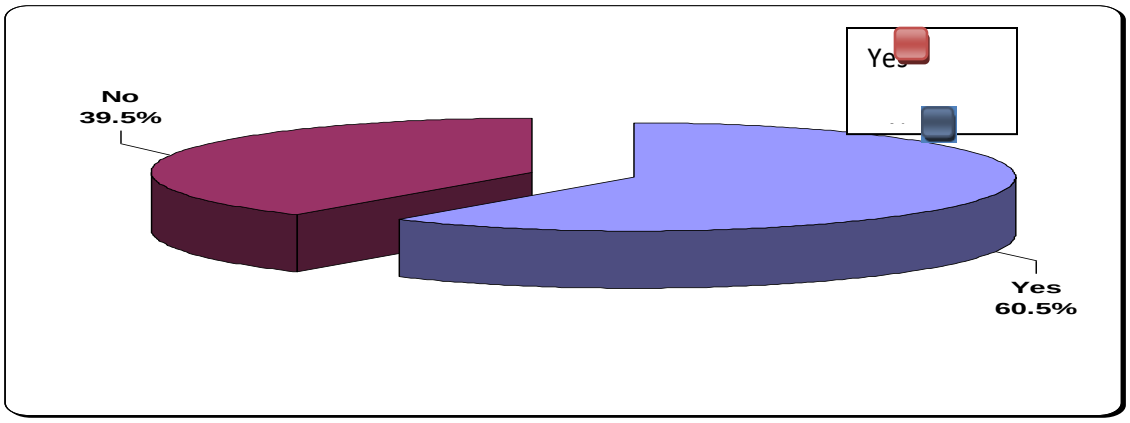

Figure (1): Distribution of the studied adolescent students regarding to their suffering from acne vulgaris in Assiut city, 2015 (n=1026)

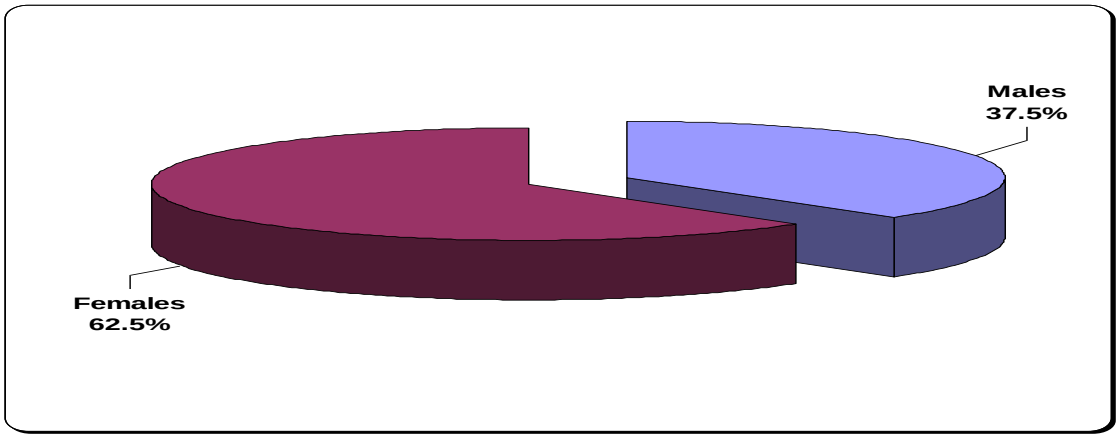

Figure (2): Distribution of the sex of studied adolescent students with acne in Assiut city, 2015 (n=621)

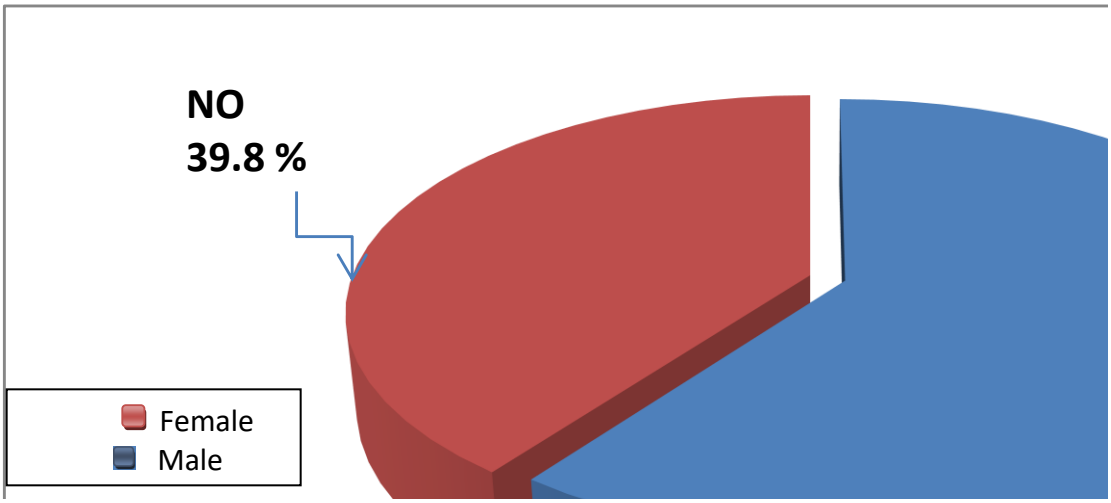

Figure (3): Distribution of studied adolescent students with acne according to their family history of acne in Assiut city, 2015 (n=621)

Table (2): Distribution of studied adolescent students with acne according to their suffering from acne in Assiut city, 2015.

Items	No. (n=621)	%
Duration of suffering		
< 1 year	312	50.2
1 – 5 years	203	32.7
> 5 years	106	17.1
Mean ± SD (Range)	3.53 ± 1.46 (1 m – 15 y)	
Places of appearance of acne vulgaris: #		
Face	511	82.3
Back	154	24.8
Shoulders	62	10.0
Chest	46	7.4
Neck	41	6.6
Symptoms of acne vulgaris: #		
Itching	238	38.3
Sense of pain	167	26.9
Pimples only	132	21.3
Burning at the affected site	112	18.0
Treatment used		
Yes	278	44.8
No	343	55.2
Types of treatment used : (N= 278) #		
Antibiotics	263	94.6
Use natural herbs	91	32.7
Hormonal treatment	13	4.7
Cortisone treatment	2	0.7

 # More than one answer

Table (3): Distribution of the studied adolescent students regarding to Acne Disability Index in Assiut city, 2015.

Items	No. (n=621)	%
As a result of having acne vulgaris, you were aggressive, frustrated or embarrassed		
Very much indeed	66	10.6
A lot	81	13.1
A little	241	38.8
Not at all	233	37.5
Acne vulgaris interfered with your daily social life, social events or relationships with members of the opposite students' sex		
Severely, affecting all activities	44	7.1
Moderately, in most activities	121	19.5
Occasionally or in only some activities	165	26.6
Not at all	291	46.8
You avoided public changing facilities or wearing swimming costumes because of your acne vulgaris		
All of time	24	3.9
Most of time	32	5.2
Occasionally	190	30.6
Not at all	375	60.4
Describe your feelings about the appearance of your skin		
Very depressed and miserable	84	13.5
Usually concerned	110	17.7

Items	No. (n=621)	%
Occasionally concerned	268	43.2
Not bothered	159	25.6
Indicate the bad you think your acne vulgaris is now		
The worst it could possibly be	56	9.0
A major problem	154	24.8
A minor problem	290	46.7
Not a problem	121	19.5

Table (4): Relationship between demographic characteristics of studied adolescent students and Acne Disability Index in Assiut city, 2015.

Items (n=621)	Acne Disability Index						X^2	P-value
	Mild (n= 393)		Moderate (n= 188)		Severe (n= 40)			
	No.	%	No.	%	No.	%		
School type								
General Secondary School	298	75.8	105	55.9	26	65.0	15.73	0.000*
Technical Secondary School	95	24.2	83	44.1	14	35.0		
Adolescent students' age								
15 - 16 years	240	61.1	104	55.3	17	42.5	6.02	0.049*
> 16 years	153	38.9	84	44.7	23	57.5		
Adolescent students' sex								
Male	160	40.7	59	31.4	14	35.0	4.84	0.089
Female	233	59.3	129	68.6	26	65.0		
Academic years								
First	191	48.6	85	45.2	18	45.0		
Second	111	28.2	57	30.3	13	32.5	9.93	0.270
Third	72	18.3	30	16.0	4	10.0		
Fourth	9	2.3	5	2.7	3	7.5		
Fifth	10	2.5	11	5.9	2	5.0		
Fathers' education								
Illiterate	7	1.8	1	0.5	0	0.0		
Read & write	25	6.4	22	11.7	2	5.0	10.73	0.218
Basic education	33	8.4	20	10.6	6	15.0		
Secondary	97	24.7	49	26.1	9	22.5		
High education	231	58.8	96	51.1	23	57.5		
Mothers' education								
Illiterate	22	5.6	10	5.3	2	5.0		
Read & write	27	6.9	15	8.0	4	10.0	9.38	0.311
Basic education	28	7.1	21	11.2	2	5.0		
Secondary	111	28.2	60	31.9	17	42.5		
High education	205	52.2	82	43.6	15	37.5		
Mothers' occupation								
Worker	195	49.6	65	34.6	17	42.5	11.72	0.003*
Housewife	198	50.4	123	65.4	23	57.5		

** There is significant difference (P<0.05)*
X^2 Chi- square test

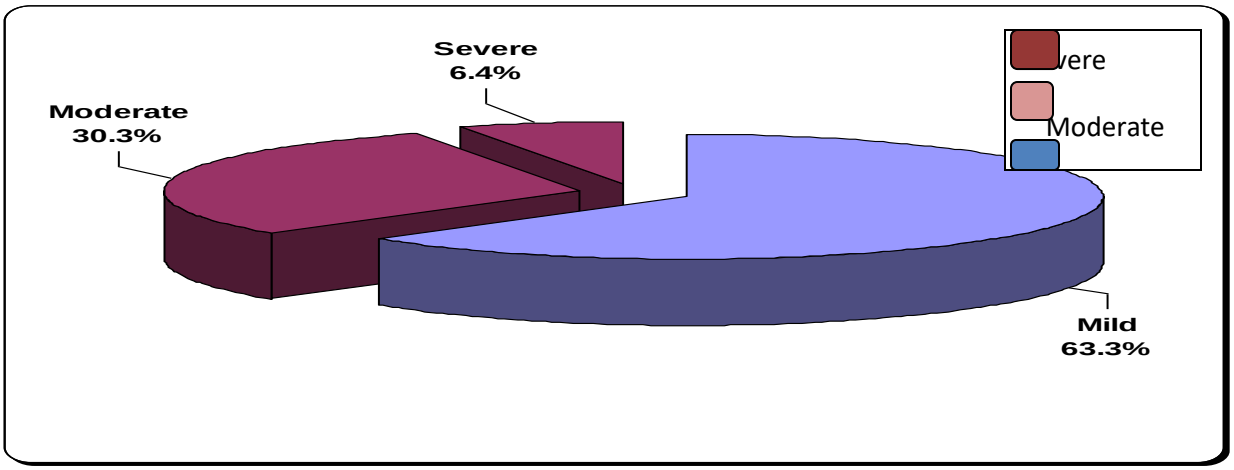

Figure (4): Distribution of the studied adolescent students according to the total score of Acne Disability Index in Assiut city, 2015 (n=621)

Table (1): Shows distribution of the studied adolescent students regarding to their demographic characteristics. Concerning adolescent students' age, it was showed that 60.1% of adolescent students , their age ranged from (15-16 years), while 39.9% of them their age was more than 16 years .The Mean age ± SD was 16.37 ± 1.18 .

Concerning adolescent students' sex, it was found that 67% of adolescent students were female. The table illustrates that 53.3% of students' fathers and 45.1% of students' mothers had university education, while 1.9% and 5.4% of students' fathers and students' mothers were illiterate respectively. Also, it was observed that more than 60.4% of students' mothers were housewives.

Figure (1): View distribution of the studied adolescent students regarding their suffering from acne vulgaris. It was found that 60.5% of studied adolescent students suffering from acne vulgaris, while 39.5% of them didn't suffer.

Figure (2): Shows distribution of the sex of studied adolescent students with acne. It was found that 62.5% of the studied adolescent students suffer from acne were females and 37.5% of them were males.

Figure (3): Shows distribution of studied adolescent students with acne according to their family history of acne. It was found that 60.2% of studied students had family history of acne vulgaris.

Table (2): Shows distribution of studied adolescent students who suffering from acne according to their history. Regarding family history of acne vulgaris, it was cleared that 60.2% of adolescent students had family history of acne vulgaris.

As regard site of acne vulgaris appearance, it was noticed that 82.3% of studied adolescent students had acne vulgaris in their faces. Also, this table presents that 38.3% of adolescent students experienced itching as symptoms of acne vulgaris.

Concerning the type of treatment used, it was observed 55.2% of studied adolescent students suffering from acne didn't use any treatment.

Table (3): Shows distribution of the studied adolescent students regarding to Acne Disability Index. It was observed that only 10.6% of studied adolescent students very much indeed were aggressive , frustrated or embarrassed .Also 46.8% of studied adolescent students reported that acne vulgaris didn't interfered with their daily social life, social events or relationships with members of the opposite sex.

Concerning avoidance of public changing facilities or wearing swimming, it was releaved that 30.6% of studied adolescent students had occasionally effect. In addition, this table shows that 43.2% of studied adolescent students were occasionally concerned about appearance of their skin. Finally, it was observed that 46.7% of studied adolescent students considered acne vulgaris as minor problem. While 19.5% of them didn't consider acne vulgaris as a problem.

Table (4): Shows relationship between some demographic data of studied adolescent students with acne vulgaris and Acne Disability Index. This table observes that there is significant difference between Acne Disability Index and school type, adolescent students' age and mothers' occupation, P= 0.000, 0.049 & 0.003 respectively.

In difference, there is not significant difference between Acne Disability Index and adolescent students' sex, adolescent students' age, academic year, fathers' education and mothers' education, P=0.089, 0.270, 0.218 &0.311 respectively.

Figure (4): Illustrates distribution of studied adolescent students' according to the total score of Acne Disability Index. It was found that 63.3% of

studied adolescent students had mild effect and only 6.4% of them had severe effect.

Discussion

Adolescents are psychologically vulnerable. They are sensitive to modifications in their bodies and appearance. Acne commonly affects young people at a time when they are undergoing maximum psychological, social and physical change. Between 30%-50% of adolescents experience psychological difficulties associated with their acne. Although the interaction is complex it can be associated with developmental issues of body image, socialization and sexuality **(Al-Shidhani et al., 2015 & Durai & Nair, 2015).**

The current study observed that slightly more than three fifth of studied students had acne and about half of them suffered from acne for less than one year ago. In the researcher point of view, these results may be explained by that the studied sample was from teenage where acne is most common during this age.

These results agreed with **(Sultana, 2012**) who carried out study in Dhaka city , Bangladesh about knowledge on acne vulgaris on adolescent girls and found that 62.8% of students had acne. Also, these results were in the same line with **(El-Khateeb et al., 2014**) who reported that the prevalence of acne among the sample was 54.2%.In addition, these results agreed with **(Suvirya et al., 2016)** who conducted study in India for assessment of self-medication practices among medical students in acne vulgaris. They reported that the prevalence of acne vulgaris was 55.9%.

According to students' family history of acne, the current study cleared that slightly more than three fifths of studied students had family history of acne . The reason for these findings is consistent with the other studies as **(Armand et al., 2015 & Bagatin et al.,2014**) and probably related to genetic factors.

These results were in the same line with **(Saker et al, 2015)** who carried out a study for evaluation of psychiatric morbidity and quality of life for acne and found that family history of acne was present among 58.3% of studied people.

Moreover, **(Armand et al., 2015)** reported that students with family history of acne were 58.3%. In addition, these results were agreed with **Bagatin et al., (2014)** who showed that about half of the adolescents students reported a family history of acne in mothers or fathers.

On the other hand, these results disagreed with **Peric' et al., (2013)** who showed that 44.7% of studied students had family history and **Durai & Nair, (2015)** who reported that 21.4% of individuals had a positive family history. Also, **El badry, (2009**) reported that family history found to be positive in 43% of adolescents.

As regard to duration of having acne, the results of the present study releaved that more than half of the studied students reported that they had acne from less than one year. It may be explained by slightly less than half of studied students were in the first secondary year.

These results agreed with **(Peric' et al., 2013)** who found that 51.4 % of sample had acne less than one year.

In contrast , the study conducted in Japanese showed that 14.7% of adolescents estimated their acne had first started between six months and one year ago **(Kubota et al., 2010)**. Also, these results disagreed with **Hazarika & Rajaprabha,2016** who conducted a study about assessment of life quality among patients with acne vulgaris in a suburban population and reported that 42% of studied sample had acne for less than 6 months.

Also, another study conducted by **Samanthula & Kodali, (2013)** who carried out a study in South India about acne and quality of life and found that 60.04% of studied participants had acne for more than one year.

With regard site of acne appearance, the present study noticed that more than four fifth of studied students had acne in their face While about one quarter of them had acne in their back This result may be explained by the face is the site which exposed to surface and easily clogging the pores of the skin by air draft and sunlight. In addition to that proliferation of sebaceous glands in these areas of skin.

These results agreed with **(Bagatin et al., 2014 & Durai & Nair, 2015**) who reported that the majority of adolescents had acne in face . In addition, these results agreed with **Tasoula et al., (2012)** who conduct a study in Greece to assess the impact of acne vulgaris on quality of life and psychic health in young adolescents and found that the prevalence of facial acne was 89.1% and acne in the back was 41.3%.

Moreover, these results were in the same line with **Saker et al., (2015)** who reported that the face was 79%, the prevailing site of lesions. Also, **Armand et al., (2015)** showed that 79% of students had acne in their faces.

Concerning acne treatment used, the results of present study observed that more than half of studied students didn't use any thing for acne treatment, while the majority of students used antibiotics and slightly less than one third of them used natural herbs for treatment. From the researcher point of view the reason for these results may be due to inadequate skin

health education and misinformation which contribute to the reluctance to seek treatment.

These results agreed with **Steylaerts, (2014**) who reported that 42.6% of students with acne didn't used acne treatment and disagreed with the present study on 31.9% of students used oral antibiotics for treatment.

In contrast, these results weren't in the same line with **Moneam et al., (2016)** who conduct study to assess the prevalence and factor affecting acne vulgaris among university students at Ajman, United Arab Emirates and reported that 6.7% of students used herbal treatment in their acne treatment.Also, These results disagreement with **Peric' et al., (2013)** who observed that 70.1% of students received treatment for acne .

The results of the present study found that more than three fifths of studied students had mild effect, while slightly less than one third of them had moderate effect and finally only 6.4% of studied students had severe effect. The explanation of these results may be due to some students didn't considered acne is a problem and it is normal event that take time and disappear.

These results were in the same line with **El-Hamd et al., (2017)** who reported that 53% of students reported mild effect , followed by 41% of them had moderate effect and only 6% of them had severe effect. In addition, these results supported by **Yap, (2012**) who reported that 59.5% of studied sample had mild effect, while , 28.5% of them had moderate effect and 12% of them had severe effect.

These results were in contrast with **Shahzad et al., (2011)** who conducted study in Pakistan about frequency and psychosocial impact of acne on university and college students and they reported that 81.3% of studied students had mild effect, while, 15.5% of them had moderate effect and only 3.2% of them had sever effect .

Moreover, these results disagreed with **Durai & Nair, (2015)** Who releaved that 48.6% of studied sample had low effect, while, 38.6% of them had medium effect was and 12.9% of them had high effect.

The present study showed that there was no association between Acne Disability Index and students' gender, The explanation for that may be due to acne affects similarly on both sexes. These results were in the same line with **(Noorbala et al., 2013 & Hanisah et al., 2009)** who reported that there was no significant difference in the Acne Disability Index score between the gender.

The present study showed that there was association between Acne Disability Index and students' age .The explanation of this result is consistent with relevant literature which mentioned that the acne increases with age. due to These results were in the same line with (**Durai & Nair, 2015**) who reported that there was significantly associated between age of studied sample and Acne Disability Index.

Conclusion

based on the results of the present study it can be concluded that slightly more than three fifths of studied adolescent students suffering from acne vulgaris. More than three of studied adolescent students had mild disability effect from acne. There was statistically significant difference between Acne disability Index and students' age.

Recommendations

based on the results of the present study it can be recommended that:

- The students require health education class awareness should be included information about skin diseases especially acne and skin care, how to deal with disease, good dietary habits and how to prevent its occurrence.
- Posters about skin care, how to control and prevent it should be distributed in the schools especially secondary schools.
- Future researches about acne prevention and control are required.

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